

The Status of Evaluation and Research on Effective Interventions Serving Boys and Men of Color

PREPARED FOR



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RESearch | **I**NTegration | **S**TRATEGIES | **E**VALUATION

RISE for Boys and Men of Color is a field advancement effort that aims to better understand and strategically improve the lives, experiences, and outcomes of boys and men of color in the United States.

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Introduction

Inequities in social determinants of health—the many dimensions that contribute to overall quality of life including education, criminal justice, economic opportunity, and workforce development—are a major driver of health inequities. Among these, educational attainment (or lack thereof) has consistently been demonstrated to have one of the strongest associations with long-term health and quality of life outcomes.^{1,2} The education achievement gap appears to have the greatest impact on boys and men of color: for black men with fewer than 12 years of education, life expectancy is 14 years shorter than that of white men with a college degree or more.³ However, the understanding of the mechanisms by which education and other social determinants intersect with each other, and health, is still nascent.

Furthermore, both public health and education professionals have raised concerns that poor health among children impedes educational attainment. Boys of color are disproportionately impacted by poor nutrition, obesity, chronic conditions such as asthma, and adverse family events that can increase risk for poor mental health, all of which can negatively impact attendance, learning performance, and eventual educational attainment. By examining health and education in concert, researchers can inform policy-makers on interventions with the potential for positive, synergistic effects.

School-based health promotion programs represent a model that engages both the health and education sectors. Schools are a critical platform to tackle childhood health issues largely because children spend so much of their time at school, and thus school is a place that can offer opportunities for interventions.⁴ Schools are also important because the behaviors and norms embraced by teachers, mentors, and peers influence a child's attitudes toward healthy living.⁵ Well-established literature has shown that early life experiences, including those at school, shape a child's health and development trajectory.⁶

For healthcare providers, schools also present an opportunity to reach socially disadvantaged children who may otherwise face challenges in accessing health services. For educators, health interventions have the potential to ameliorate children's health concerns and foster greater focus on learning. This is especially important when attempting to assess health programs serving minority populations; in 2014, more than 40 percent of students of color attended a high-poverty public school.⁷

Methods

THEORETICAL APPROACH

Chandler's *Life Course Framework for Improving the Lives of Boys and Men of Color* calls out environmental and experiential factors that interactively shape both human development and life course outcomes.⁸ These factors are especially critical for children from ages 5 to 12 years, when structural advantages in cognitive and socioemotional skills as well as school readiness in reading, writing, and math are shaped by families, neighborhoods, and public systems, such as nearby libraries and safe spaces to play. Notwithstanding this constellation of factors, schools, however, are paramount. Schools offer the foundational opportunity to engage with existing culture and systems so that we can keep boys of color "on track," per Chandler's framework.

We extend Chandler's framework on socioemotional and educational outcomes to health outcomes. Investing in health and educational outcomes could yield improved health behaviors and access to healthcare, and post positive returns in cognitive and socioemotional skills for boys of color.⁹ While achieving both outcomes is more "big picture," we first focus on examining health outcomes. This is because it provides a more precise, albeit narrower, lens in the program evaluation space. This focus should provide sharper insights on which interventions have merit, and if so, which conditions are needed to make them scalable.

We then zoom out to examine whether interventions encompass both education and health. Our aim is to identify opportunities for interdisciplinary collaboration between educators and health care providers that can improve the overall life course for boys and men of color (BMOC).

We are cognizant that this scan compartmentalizes to young and middle childhood years, and Chandler's life course framework puts us all on notice that early life interventions are necessary but not sufficient. However, this period is acknowledged as pivotal, where keeping BMOC children "on track" in health could have affirmative life course consequences in educational attainment, physical and mental health, and socioeconomic well-being.

TECHNICAL APPROACH

In this field scan, we reviewed the following health-based interventions conducted in schools:

- 1) general health improvement programs
- 2) physical activity and nutrition programs
- 3) asthma management
- 4) school-based health centers
- 5) school-based mental health services

We selected these interventions because they address health and access conditions that disproportionately impact children of color, and have previously demonstrated benefits for children's health outcomes. We then evaluated the existing evidence on the degree to which, if any, these health interventions also fostered improvements in education outcomes for boys of color.

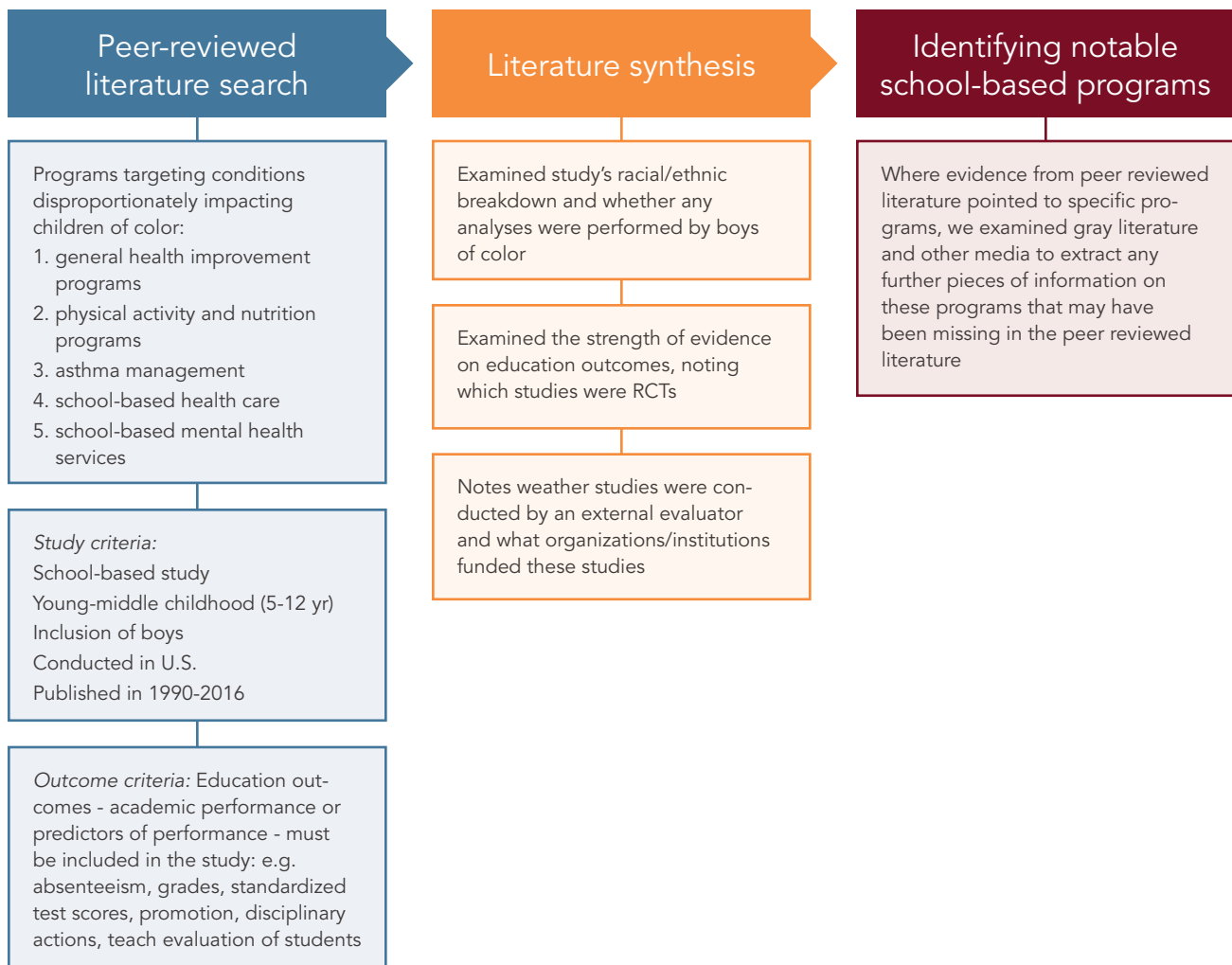
For each type of intervention, we identified recent systematic literature reviews that summarize the evidence on the efficacy of that intervention. When applicable, we also conducted limited searches of relevant literature for studies with publication dates more recent than the systematic reviews. Because this scan focused on health and education, our literature review employed major repositories of health, PubMed (<https://www.ncbi.nlm.nih.gov/pubmed>), and education, ERIC (eric.ed.gov), as well as Google Scholar for cross-disciplinary publications.

We searched for peer-reviewed literature that met the following inclusion criteria: target population young and middle childhood (approximately ages 5–12); inclusion of boys; published in English; conducted in the United States; publication date from 1990 to 2016; and inclusion of education outcomes (Figure 1). Education outcomes were defined as those that measure academic performance or predictors of performance, including absenteeism, grades, standardized test scores, grade-level promotion, disciplinary actions, and teacher evaluations. We excluded studies that examined only girls or older children, or addressed interventions that did not occur in school settings. We attempted to identify interventions with evidence (peer-reviewed scientific literature) for positive impact on children’s health outcomes.

Through the use of general search engines, we also located existing programs, with which we then returned to the literature to search with these program names for any published literature on evaluations. We also cross-referenced identified funders of existing programs or evaluations to determine if the funders had any other programs for exploration.

We then assessed on the following items: 1) whether the study included boys of color; 2) whether the authors performed analyses specific to boys of color; 3) the strength of the evidence on education outcomes; 4) whether the study was conducted by an external evaluator; and 5) which institutions or organizations funded these studies.

FIGURE 1 METHODS USED IN THE EXAMINATION OF RESEARCH STUDIES ON HEALTH AND EDUCATION INTERVENTIONS ON BOYS OF COLOR



Findings

GENERAL HEALTH PROGRAMS

Some programs focus on “health” in a broad, general sense, inclusive of individual health, child development, health behaviors such as drug use, and emotional health such as feeling safe at school. Some of these programs are models that schools implement by customizing to their specific needs and resources. In this scan, we identified three programs for further examination:

- **The Whole School, Whole Community, Whole Child (WSCC)** is a program model offered by the CDC (<http://www.cdc.gov/healthyyouth/wsc/index.htm>) focusing on youth, addressing critical education and health outcomes, organizing collaborative actions and initiatives that support students, and strongly engaging community resources. The goal of the WSCC is to improve healthy development and educational attainment for students. This program is adopted by schools across the nation but is not culturally focused toward a specific population or gender.
- **The Safe Schools/Healthy Students (SS/HS)** initiative is a grant model created by the Substance Abuse and Mental Health Services Administration (SAMHSA) (<http://www.samhsa.gov/safe-schools-healthy-students>) and focuses on mental health, school violence, substance abuse, and related issues to create safe learning environments.
- **Children’s Aid Society** (<http://www.childrensaidsociety.org/>) targets academic outcomes through combined services such as extracurricular programs, parent engagement and education, and health and wellness services. A part of their stated mission is to improve health to positively impact academic outcomes.

General Health Programs: State of Existing Evidence

In ERIC, the majority of the identified literature in this field scan pertained to one of these programs. Multiple scholars have evaluated these programs but largely from the perspective of implementation challenges or critique of the framework itself.¹⁰⁻²³

One article evaluated an implementation of the Safe Schools/Healthy Students (SS/HS) initiative with a focus on Native American children, though not on a single gender.¹³ Findings included a decrease in absenteeism and reduced fighting. Additionally, one study reviewed a coordinated school health program in 158 schools in Delaware, encompassing grades K–12. The authors measured student scores in reading, writing, and mathematics, as well as school performance and student progress and found a positive correlation with the implementation of the program.²⁴ However, the population was the general schoolwide population, not focused on any sub-population.

General Health Programs: State of Evaluation

There are a few national models for programs that integrate health practices into the educational system. However, while they recognize the importance of health to education, the programs lack specific academic goals. These programs have been evaluated, but mainly for the efficacy of the framework, or health/school environment outcomes. Rarely have studies contained academic outcome measures, nor do they compare schools with the program to those without.

Additionally, the published studies are not directed to journals with an education administration focus; rather they tend to be published in journals such as *Journal of School Health* (which dedicated an entire 2015 issue to the WCCS model), *NSAN School Nurse, Health Education*, and *Journal of School Violence*. The exception to this was one article in *Evaluation and Program Planning*.

PHYSICAL ACTIVITY AND NUTRITION PROGRAMS

Despite what appears to be a leveling-off of the increasing trend in childhood obesity overall, disparities by race/ethnicity persist such that among 6- to 11-year-olds, it is at 14 percent for non-Hispanic whites, 21 percent for African Americans, 10 percent for Asians, and 25 percent for Hispanic children.²⁵ Among certain population subgroups, such as low-income American Indian/Alaska Native (AI/AN) children, obesity prevalence among 2- to 4-year-olds has increased considerably over time, from 16 percent in 1998 to 21 percent in 2011²⁶ (by adulthood, the prevalence of obesity among AI/AN is 40 percent²⁷). Similarly, another important, yet often overlooked, group is Native Hawaiian and Other Pacific Islanders (NHOPI), who have been shown to be 30 percent more likely to be obese than whites.²⁸ Overall, children are largely not meeting dietary and physical activity recommendations, which put children at risk for obesity and obesity-related conditions.²⁹⁻³² According to the National Health and Nutrition Examination Survey, about one-fourth of 6- to 15-year-old children in the United States met the 2008 Physical Activity Guideline of at least 60 minutes of moderate-to-vigorous physical activity per day.³³ Boys, younger children, and children of non-white race/ethnicity have been shown to have higher physical activity levels than girls, older children, and white children.³⁴ Despite higher physical activity rates among boys and children of non-white race/ethnicity, a more recent meta-analysis indicated that while national childhood obesity rates have flattened, obesity persists among communities of color—particularly among blacks and Latinos, and for both boys and girls.³⁵

There exists a growing recognition of the associations between child nutrition, physical activity, and cognitive outcomes.³⁶⁻⁴¹ School-based interventions are recognized as an important vehicle for improving physical activity and nutrition.⁴²⁻⁴⁵ The Centers for Disease Control and Prevention (CDC) detail the academic benefits of regular physical activity as helping improve students' academic performance, including academic achievement and grades, and academic behavior, such as time on task, concentration, and attentiveness in the classroom.⁴⁶ Physical activity also has been associated with reduced feelings of depression and anxiety and promotes psychological well-being.⁴⁷

Physical Activity and Nutrition Programs: State of Existing Evidence

There is an extensive body of literature in peer reviewed health journals examining the impacts of physical activity and nutrition interventions on overweight/obesity. Notably, randomized studies, systematic and meta-analysis reviews on the effectiveness of school-based interventions to improve physical activity and nutrition have been published in the last five years. We focused on the systematic reviews of the interventions aimed at improving physical activity and nutrition to improve both educational and health outcomes. Because a number of interventions include both a physical activity and nutrition component, we examined them together here. From the systematic review studies, we identified specific programs/interventions and conducted additional searches to obtain more information on the specific interventions, with special attention to finding any mention of programs targeting boys of color.

Within PubMed, we identified 11 systematic reviews that identified and summarized on the effectiveness of child nutrition and physical activity interventions on education outcomes.^{41,48-57} While most of these reviews noted whether programs reported on race/ethnicity, none was able to draw any conclusions on race/ethnicity, as many evaluations did not report race/ethnicity. Similarly, there was no mention of whether impacts differed by gender. Of the 123 studies cited in these reviews, 15 met the inclusion criteria for our field scan. The high-level finding from these studies suggest that increased student physical activity and physical fitness can best be achieved through a comprehensive approach that includes physical education, recess, and afterschool periods, and that overall increased physical activity has a positive impact on various educational outcomes. Similarly, nutrition programs—namely school breakfast and lunch—have been evaluated in various settings, and findings show associations with improved educational outcomes.

PHYSICAL ACTIVITY AND NUTRITION PROGRAMS

- Most studies include children of color, particularly Hispanic students; no programs or studies were specific to boys.
- Increased physical activity—brief breaks, physical education classes, and afterschool programs—are associated with improved test scores.

We examined the evaluation literature to identify specific nutrition and physical programs and to find any lessons that might be found regarding these programs on boys of color. The most commonly cited physical activity and nutrition programs in the health literature were Take10, SPARK, Hip-Hop to Health, FitKid, Energizers, CATCH, School Breakfast Program, and Physical Activity Across the Curriculum (PAAC). Hip-Hop to Health is a notable example of a physical activity program that has been used successfully in school settings and targeted to communities of color, but has not been evaluated for both health and education outcomes.^{58–60} We also identified one program from the education literature, COPE (Creating Opportunities for Personal Empowerment) Healthy Lifestyles TEEN (Thinking, Emotions, Exercise, and Nutrition) program, an educational and cognitive behavioral skills-building program targeting Hispanic adolescents.⁶¹ In one of the few evaluation studies, the authors did examine outcomes specific to boys, and the age was a little higher than our intended range, but we felt it should be noted for its focus on a minority population. However, as with most other evaluations, it did not include academic outcomes beyond changing attitudes toward healthy habits.

Of these identified programs, SPARK, Take10, Energizers, PAAC, and FitKids have had evaluations where both health and education synergies are acknowledged, measured, and assessed in a rigorous way (see Table 1). SPARK, a two-year program designed to promote physical activity in and out of school, included enhanced physical education lessons lasting 30 minutes at least three days per week, and found favorable impacts on academic achievement scores.⁶² Similarly, Take10, a classroom

physical activity program integrating an academic and physical activity curriculum, was shown to increase levels of moderate physical activity among elementary-level students while also reducing time off-task in the classroom and improving scores in reading, math, and spelling.^{63,64} Brief breaks for stretching or other activity associated with physical well-being appear to be able to be incorporated during academic time. The Energizers program, a Take10 affiliate program, for example, uses short classroom-based physical activities, and has been shown to improve on-task behavior among students.^{40,65} Another notable intervention, PAAC—a three-year cluster randomized controlled trial comprising of two 10-minute lessons per day taught by classroom teachers—was found to improve both daily physical activity levels and academic achievement scores.^{66,67} FitKids, a nine-month randomized controlled PA intervention comprising of a two-hour daily afterschool physical activity program, was shown to improve executive control among children, measured both by electrical activity in the brain and behavioral indices.⁶⁸

An evaluation of a Take10 program in a predominantly Hispanic elementary school in urban Chicago found a positive impact on health and education, however, only student knowledge regarding the importance of physical activity, nutrition, and self-reported concentration were reported, and there were no major takeaways regarding how the program met or did not meet the specific needs of the Hispanic children at the school.⁶⁹ Take10 is often one component of larger interventions that include physical activity and nutrition, as in the case of the Healthier Options for Public Schoolchildren (HOPS) program implemented in four Florida schools where the student population was largely Hispanic; this study found the intervention improved BMI percentiles and math scores.⁷⁰

It is notable that our literature search did not produce any studies specifically examining interventions targeting health and education outcomes for African Americans. Also missing from the literature is further study of any impact of school-based health interventions for American Indian and Alaska Native (AI/AN) populations, Asian and Pacific Islander groups, namely Native Hawaiians. In 2011, only 25 percent of middle school students in the state of Hawai'i met recommendations for physical activity for 60 minutes or more per day on all of the past seven days.⁷¹ While there are no studies linking health and educational outcomes in this population, there is notable work advocating for school-based interventions to reach Native Hawaiian children.^{72–75} As with Native Hawaiian literature, there is recognition of the need for obesity prevention among AI/AN children, but there are no evaluation studies on health and education interventions.⁷⁶ Thus, though the body of evidence linking physical activity and nutrition programs to health

and education is strong, there remain critical questions on how successes from these programs could target the special needs of boys and communities of color across the United States, and how schools with children coming predominantly from communities of color can best leverage the synergistic effects of better health and education.

To supplement our literature search on the specific intervention programs identified, we also conducted grey literature searches via Google and searches on one social media platform—Twitter—to better understand the breadth and reach of these programs. In the social media searches and Internet searches, Michelle Obama’s Let’s Move program appeared predominantly.⁷⁷ Use of #activeschool and #healthyschool hashtags on Twitter also generated examples of schools or news articles highlighting health successes at schools⁷⁸ and a case study exemplifying interventions for both improved health and educational outcomes.⁷⁹ The case study described an evaluation of the Healthy People/Healthy Economy Coalition, which includes programs targeted at increasing physical activity in schools. The program was implemented in elementary and middle schools (third to sixth graders) in a district that was 92 percent low income (low socioeconomic status (SES) was the targeted population for selection). The participating population was 83.5 percent Latino, 2.2 percent Asian, 1.7 percent black/African American. The sample was also 37.7 percent male. The authors found that higher physical activity was associated with higher standardized test scores in math and reading, however, school attendance was not impacted.

Physical Activity and Nutrition Programs: State of Evaluation

The Take10 program (including Energizers) was developed in 1999 by the International Life Sciences Institute Research Foundation (ILSI Research Foundation), which is a nonprofit, public, charitable organization. Take10 has been implemented in various schools all over the United States and internationally in conjunction with academic institutions that have led evaluations of these school-based programs. These school-based studies are evaluated by external university-based investigators. Funding for these evaluations is mixed with private foundation and National Institutes of Health (NIH) support. The ILSI Research Foundation, which designed the Take10 program in collaboration with other university-based investigators, has been involved in publishing reviews of the evaluations of school programs using Take10. The SPARK, FITKids, and PAAC programs were all NIH-funded studies (all through R01 grants), conducted by university investigators in collaboration with various schools to implement the programs. The evaluations were conducted by the university-based principal investigators of the NIH grants and their associated teams.

ASTHMA MANAGEMENT

Children of color are disproportionately burdened by asthma. Whereas the prevalence of asthma among white children is estimated at 7.6 percent, these estimates increase to 13.4 percent for African American children and 8.5 percent for Hispanic children.⁸⁰ Asthma exacerbations are one of the leading causes of absenteeism among school-aged children.⁸¹ In 2013, over 50 percent of children of color with asthma missed school days related to their condition.⁸²

Researchers have identified a number of pathways by which poorly controlled asthma can negatively impact children’s academic achievement: directly, through missed days of school; and indirectly, through chronic lack of school engagement and cognitive delays.⁸³ While other chronic diseases impact school performance, asthma is one of the only diseases that has spurred large-scale, school-based interventions and rigorous evaluation of these interventions.

Over the past several decades, healthcare providers, public health departments, and schools have developed multiple strategies to alleviate the burdens of asthma for children. Cicutto and colleagues list the following typologies of school-based asthma interventions: (1) asthma education: education sessions conducted in school on asthma self-management; (2) asthma medications: schools provide medications, observe medication use, and create policies that facilitate access to quick-relief inhalers; (3) case management/care coordination: school staff identify students with asthma, provide education on medication use, and coordinate care with families and healthcare providers; (4) on-site asthma care: the school offers an asthma/allergy specialist on site, e.g., through a mobile clinic or school-based health centers; (5) school environmental remediation: school administration identify and mitigate environmental asthma triggers in school structures.⁸¹ Lastly, schools have also implemented more comprehensive programs that incorporate several or even all of these interventions in concert.

SCHOOL-BASED ASTHMA PROGRAMS

- Black/African American and Hispanic boys made up 30–50+ percent of study populations.
- Intensive, comprehensive interventions (school nurse case management, asthma education, quick-relief medications, and asthma care on-site) show some evidence for improving academic performance.
- No studies conducted evaluations specific to boys of color.

Asthma Management: State of Existing Evidence

We identified three reviews through the PubMed database on asthma interventions in schools (Coffman et al. 2009, a systematic review of asthma education programs; Alooka et al. 2014, a systematic review of asthma interventions in primary schools; Cicutto et al. 2014, a review of models of school-based asthma programs). Of the 69 studies cited across these reviews, 30 met our inclusion criteria (Table 2). We included another study as the only examination of a predominantly Hispanic group of children,⁸⁴ and identified one additional study within ERIC.⁸⁵

The article found in the ERIC database presented findings from a randomized community trial design with 16 elementary and middle schools matched and randomly assigned to either an intervention or a control group. Similar to other studies, the project did not target specific racial/ethnic populations or gender. Further, the academic outcomes investigated were impacts on the school health office and student attendance.⁸⁵ Student performance was not considered.

Nearly all studies examined absenteeism, either specifically due to asthma or all-cause absences. Most studies found no significant changes in absenteeism among students who participated in asthma interventions. Of the studies that did find a decline in absenteeism, the findings suggest that more intensive interventions, such as school nurse case management⁸⁶ and providing medications,⁸⁷ reduce absenteeism. Providing asthma care on-site also demonstrated an association with fewer absences, but these studies were the weakest in design, often observational, without comparison groups, or cross-sectional.^{88–90} One randomized controlled trial involved school nurse care and linkage with community providers, and was conducted among a diverse student population. The study found no difference in absences.⁸⁵

Five studies examined academic performance among children who participated in asthma education interventions. One study found no change in grades⁹¹ whereas another (the Open Airways program) found GPA improved over 24 months among students who received the intervention.⁹² Two studies found that science grades specifically rose among intervention students.^{93,94} Two studies of nurse case management found that improvements in GPA and test scores were specific to the children's characteristics: in one, only those with "failing" grades and scores showed improvement;⁹⁵ in the other, only those with concurrent improvements in family psychosocial support.⁹⁶ In another case management program in which 97 percent of the children were Hispanic, there were no differences in English language arts or math test scores.⁹⁷

Bartholomew and coauthors found that grades across multiple subjects, as well as reading and writing test scores improved among students who received an "enhanced" intervention of visits with study physicians, free medication, and development of a treatment plan (in addition to asthma education, school environmental assessment, and school nurse care coordination).⁸⁷

All studies included boys and most included boys of color. Among studies conducted in the United States, 60 to 99 percent of participating students were non-white and primarily African American and Hispanic students. No studies conducted analyses specific to boys of color. A handful of studies performed analyses stratified by gender on nonacademic outcomes, and found that asthma education interventions had differential impacts for boys vs. girls. In two studies, girls, but not boys, demonstrated improvements in self-efficacy for managing their asthma.^{98,99} Nine studies reported adjustment for gender in statistical analyses, but only one reported the gender coefficient and its level of significance. In one other study, the authors reported testing interaction terms by gender and race, and found no significant associations.¹⁰⁰ No studies conducted analyses specific to boys on educational outcomes.

The quality of the evidence is considerably stronger in asthma intervention studies relative to studies on other types of school-based healthcare interventions. Nearly all of the studies on asthma education employed robust study designs, with the majority utilizing randomized controlled trials and the remainder consisting of longitudinal observational studies with a comparison group. With the exception of two,^{87,101} the study designs for the other types of interventions were typically observational and/or cross-sectional, lacking in comparison groups. They often conducted statistical adjustment for student differences but did not report regression coefficients, so associations by gender or race/ethnicity could not be identified.

Asthma Management: State of Evaluation

The strength of the study designs may be related to meeting the expectations of evaluators and funders. Most studies were conducted by an external evaluator, or under a partnership between an external evaluator (typically a university-based investigator) and the school system. Although a handful of foundations and public health departments supported the research, the major funding source for evaluation of asthma interventions has been the National Heart, Lung and Blood Institute (NHLBI), which has a mission related to health outcomes, not academic outcomes. Of note, studies of interventions involving medications frequently received additional support from pharmaceutical corporations.

SCHOOL-BASED HEALTH CENTERS

School-based health centers (SBHCs) are school-based clinics that offer primary health care and may also provide other services, such as dental care, social services, or mental health services.¹⁰² An SBHC typically consists of a pediatric nurse practitioner, with an affiliated pediatrician supervisor, and multidisciplinary teams. Availability of an SBHC is associated with fewer emergency department visits and hospital admissions, higher rates of vaccination and receipt of other preventive services.¹⁰² SBHCs have the potential to improve education outcomes in multiple ways, including: 1) for children beginning kindergarten and first grade, prevent delays in school starts by offering physical exams and immunizations; 2) by offering on-site consultation, reduce absenteeism and early dismissal for children with both acute illnesses and chronic conditions that require ongoing management; 3) offer health education and other activities to encourage healthy behaviors; 4) screen and link treatment for students with mental illness; and 5) foster student and family engagement or “connectedness” to the school.¹⁰³

School-Based Health Centers: State of Existing Evidence

Within the PubMed search, we identified systematic reviews that identified and summarized on the effectiveness of school-based health centers on education outcomes.^{102,104} Of the 47 studies cited in these reviews, only 9 met the inclusion criteria for our field scan, and two were evaluated under other program types (asthma and mental health services) (Table 3).

Because SBHCs are generally established to serve children and adolescents without other sources of healthcare, most students studied in the literature were in families with low incomes and/or racial/ethnic minorities. The study populations all included boys and across studies ranged from 60 to 95+ percent children of color. Six out of ten studies identified a reduction in absenteeism associated with a SBHC. Two studies identified an increase in immunization compliance and its impact on school entry. One demonstrated SBHC availability associated with a decrease in exclusions from first grade¹⁰⁵ and another with timely completion of kindergarten health assessments.¹⁰⁶

SCHOOL-BASED HEALTH CENTERS (SBHCS)

- Most studies examine adolescence rather than young and middle childhood.
- Boys of color made up 30-50+ percent of study populations.
- A handful of studies found having an SBHC was associated with fewer school absences. However, the quality of evaluation conducted on SBHCs is weak.

There was limited examination of other education outcomes, such as academic achievement. One study reported higher grades among students in a school with an SBHC,¹⁰³ whereas another did not find an improvement in grades.¹⁰⁶ However, any conclusions from the existing literature would be speculative. First, there are too few studies to form a body of evidence on the educational impact of SBHCs. Second, the study designs were too weak to draw any causal inference. Four studies employed cross-sectional designs, including schools with and without SBHCs, and described associations with concurrent education outcomes. It is not possible to attribute findings to the availability of the SBHC or other characteristics associated with schools or districts that are more likely to invest in SBHCs. The remaining studies used pre- and post-designs (before and after implementation of SBHC) but did not include comparison groups. Only two studies employed statistical adjustment for potentially confounding factors such as English-language learners and individualized education plans.^{103,107}

The ERIC database did not include any additional studies that qualified for this scan regarding health centers. However, the grey literature scan identified the promotion of the link between SBHCs and educational outcomes. The *National Assembly on School-Based Health Care (2016)* disseminates information titled *School-Based Health Centers and Academic Success*. In it, they promote the inclusion of wellness programs in education reform measures. The document references (but does not cite) research confirming that “health disparities affect educational achievement.”

School-Based Health Centers: State of Evaluation

Approximately half of the studies were conducted by an external evaluator. The evaluations were funded by a variety of sources, including foundations, federal agencies, local health systems, and school districts. Of those that reported findings from an internal evaluator, we infer that those studies were at least partially funded by the school or school district.

SCHOOL-BASED MENTAL HEALTH SERVICES

An estimated 23 percent of children ages 6–11 in the United States have emotional or behavioral disorders, with only slightly more than one-half receiving any type of treatment, either medication or psychosocial services.¹⁰⁸ For boys of color in particular, mental health services are a much-needed and under-utilized alternative to school disciplinary actions or the criminal justice system.¹⁰⁹ School settings have become increasingly recognized as a place to identify mental illness in students early, offer more accessible services, and potentially improve outcomes by gaining a greater understanding of children in the school context. In 2003, 57 percent of school-based clinics report offering mental health services.¹¹⁰ Nevertheless, use of school-based mental health services for treatment remains in its early stages: nearly two-thirds of children with emotional or behavioral disorders do not receive school-based psychosocial services.¹⁰⁸ Earlier work suggests that racial and ethnic disparities in use of mental health services are ameliorated among those with access to school-based services.¹¹¹

There is an abundance of evidence documenting the importance of children’s mental health on educational outcomes.¹¹² Schools have thus engaged in several types of efforts to address student mental health, ranging from schoolwide universal prevention programs to targeted interventions. The bulk of investment in programs and evaluation has been devoted to school efforts for overall mental health, not mental health services.¹¹³ Three broad models of partnerships with external mental health services have been described: (1) school-supported: in which trained school staff perform interventions; (2) community connection: formal links to external providers off-site; and (3) comprehensive, integrated models.¹¹⁴ Because the overarching theme of this field scan is to examine the closer integration of healthcare services with education, we examined the third model, i.e., the practice of providing formal mental health services on-site at schools. We considered the following professionals to offer formal mental health services: licensed clinical social workers, marriage and family therapists, psychologists, and psychiatrists.¹¹⁵

SCHOOL-BASED MENTAL HEALTH SERVICES

- There is growing interest in providing mental health services on-site at schools.
- Evaluation of the health and education impacts of school-based mental health services has been minimal.
- The few published studies all included boys; in three studies, at least 50 percent of students were children of color.
- Fast Track, a conduct disorders program with extensive evaluation, showed improvement at third grade, but all gains were erased by fifth grade.

School-Based Mental Health Services: State of Existing Evidence

Very little literature exists in either database on the provision of formal mental health services in schools, such that we were unable to identify any systematic reviews specific to this. Paulus and colleagues, and Roness and Hoagwood conducted systematic reviews on school-based mental health interventions in general, some of which included mental health professionals.^{115,116}

Hoagwood conducted a review of school-based interventions that target both academic and mental health.¹¹⁷ Across these three reviews, most studies examined the efficacy of prevention and early intervention efforts conducted by trained school staff, rather than co-location or integration of mental health services. An additional few systematic reviews addressed a specific mental health concern, such as depression,¹¹⁸ anxiety,¹¹⁹ and violence prevention,¹²⁰ and the interventions described were more likely to involve mental health professionals. No reviews have addressed to what extent the general availability of mental health services on-site can alleviate the variety of mental health conditions across a student population.

In this field scan, we therefore focused on studies that describe school-based mental health programs that include the participation of a mental health professional on-site (for example, therapeutic services delivered by a psychologist, rather than programs delivered by teachers) (Table 4). We identified seven studies from the systematic literature reviews listed above that also examined education outcomes, and one additional study identified from citations related to the reviews.¹²¹ Within the ERIC database, we identified one other study that focused on the “satisfaction with the school environment” as the outcome, in an evaluation of a school-based health center.¹²² Due to the sparse literature within our original time frame, we included studies dating back to 1990.

The most thorough evaluation is a series of studies conducted on Fast Track, a conduct disorders prevention program implemented in 54 schools spanning the nation and urban and rural settings (Durham, North Carolina, Nashville, Tennessee, Seattle,

Washington, and rural Pennsylvania). Fast Track consists of screening children in kindergarten for high risk of subsequent development of conduct disorders and then implementing a multi-year program from first to tenth grade that includes home visits, parent training, parent-child sessions, child group sessions on social skills, with content adapting over time to children’s developmental needs.¹²³ Early years of Fast Track showed promise, with children in intervention groups demonstrating higher grades and fewer behavioral problems in third grade; however, by fifth grade those gains are erased.¹²⁴ Although Fast Track children are less likely to develop conduct disorders, oppositional defiant disorders, or engage in criminal behavior,¹²³⁻¹²⁵ these subsequent studies have not identified whether Fast Track has impacted other outcomes that may be related, such as grade promotion, graduation, or school engagement.

Two studies examined group cognitive behavioral therapy delivered in schools,^{126,127} and found no statistically significant effects on teacher-reported outcomes of learning problems¹²⁷ or observed “on-task” behavior.¹²⁶ Of note, the target populations were considerably different, with one focused on students exposed to violence with symptoms of post-traumatic stress disorder¹²⁸ and the other on students with attention deficit hyperactivity disorder.¹²⁶

Two studies examined interventions that combined group social skills training based on cognitive-behavioral strategies and individual sessions with a mental health professional.^{129,130} Both studies targeted children with difficulties in social relations and reported no significant differences in teacher-reported learning problems or academic performance.

Although the number of identified studies was small, the quality of designs was high, with five employing an experimental design and randomization at the school or classroom level and one observational study employing multivariate matching to identify a comparison group.¹²¹ All studies included boys; in three studies, at least 50 percent of students were children of color, and one additional study described the setting as “multicultural” without greater detail on the racial/ethnic composition of the students (Table 4). No studies conducted analyses specific to boys or children of color, with the exception of Lochman and colleagues, who examined an intervention specifically addressing black children experiencing social rejection and aggressive behavior.¹³⁰

Despite the large number of studies identified in the systematic reviews on interventions for anxiety¹¹⁹ and depression,¹¹⁸ none met the criteria of inclusion of mental health professionals in the intervention, examination of education outcomes, and a target population of children ages 5–12. We discuss below some possible reasons for the lack of studies that fit our search interests. Of note, within the literature on school-based health centers, we had previously identified one study¹³¹ that examined students with mental health conditions who sought care at school-based health centers, but this study did not address education outcomes.

Our findings mirror the work of others who have investigated literature on evaluations for mental health programs in schools. In 2015, Iachini and colleagues performed a meta-analysis of the literature on interventions targeting high school students, and only found one program specifically focused toward BMOC.¹³²

School-Based Mental Health Services: State of Evaluation

The studies identified were all conducted by external evaluators based at academic institutions. The funding sources included the National Institutes of Mental Health, National Institute on Drug Abuse, Centers for Disease Control and Prevention, Substance Abuse and Mental Health Services Administration, the Robert Wood Johnson Foundation, and the US Department of Education. Despite extensive reviews, the studies that met the inclusion criteria for this field scan were not conducted within the past five years. Thus, despite the rapid expansion of school-based mental health services in recent years, there has not been a parallel increase in publication of peer-reviewed evaluation.

KNOWLEDGE GAPS

We are not the first to review the state of research at the intersection of education and health. Similar to our field scan, Murray and colleagues reviewed evaluations of school-based health programs that measured academic outcomes.¹³³ The review had no focus on specific ethnic groups, but even in a wider search dating back to 1945, their results were frustratingly similar to ours. They found that very few randomized control studies were evaluated in the published literature and ultimately only identified 17 total reports to include in their review. They did find that some health programs were associated with positive academic outcomes, but the literature is lacking, even among a broader student population.

In reviewing the existing literature and general information on identified programs, we identified themes across all areas:

- ***Fewer studies or programs are focused on young or middle childhood.*** In the national programs, the focus is on the full life cycle into adulthood. Although young and middle childhood groups were most often included in physical activity and asthma management interventions, we did not identify evaluations comparing efficacy for young vs. middle, despite major behavioral and developmental changes from ages 5 to 12. The majority of studies on SBHCs examined outcomes among adolescents.¹⁰² Although SBHCs by definition are primary care providers, the scientific literature has emphasized the role of SBHCs on influencing health risk behaviors (smoking, alcohol, and substance use) and sexual health and reproductive outcomes. Interventions from a mental health services perspective, e.g., programs to address depression and anxiety, have been predominantly conducted in adolescent populations. Recent evidence of the rise of suicide among children in middle school may drive greater focus on earlier years.¹³⁴ As described above, mental health interventions driven by education have more often targeted early childhood due to an interest in disorders described as behavioral or externalizing.

- ***Lack of analysis specific to boys.*** Programs are not targeted, or modified, to be gender specific. The overwhelming majority of studies did not perform stratified analyses by gender, and thus it is not clear to what extent findings can be applied to boys. Given known differences between boys and girls regarding physical activity, health behaviors, and symptoms associated with mental illness, we may expect that the effects of different types of interventions may differ for boys. For example, physical activity interventions might be an important way to target educational outcomes for boys, given boys may be more likely to want to participate and engage school-based physical activity programs. On the other hand, prior research has shown that boys engage in asthma self-management at a lower rate than girls.¹³⁵ The limited studies that examined boys and girls separately found that asthma education appeared to be effective only for girls, and also secondary benefits, such as improved self-esteem, were only observed for girls as well.^{98,99} The stigma associated with mental health services use may be particularly exacerbated among boys of color whose conditions have been created by, or amplified by, exposure to violence and/or trauma.¹⁰⁹ Thus, overall, there is little understanding of whether interventions should be tailored for boys, and if so, how.
- ***Lack of disaggregated analysis specific to race or ethnicity, and lack of inclusion of other racial/ethnic groups.*** None of the systematic reviews across all program types examined groups separately to determine whether outcomes may be different by race/ethnicity. Some studies failed to report any race/ethnicity data; among those that did, the predominant groups were African American and Hispanic. In some cases, the evidence from studies is particularly limited because children speaking languages other than English were excluded.¹⁰¹ The Take10 physical activity program has been implemented in schools disproportionately Hispanic, however there are few lessons that have been drawn in these studies that can be applied to other programs targeting Hispanic children or other communities of color. The potential of these programs for black students is notable as one study among a population of mostly black (91 percent) 8- to 11-year-olds found exercise causes alterations in neural circuitry supporting cognitive control in overweight children.¹³⁶ However, without intervention-based studies of school programs, it is unclear how effective such a program would be in affecting health and education outcomes for black boys.

With the exception of the physical activity and nutrition literature, we identified only a handful of studies that included children of other minority racial/ethnic groups. More specific evaluation is needed to assess potential differences between subgroups as well: for example, asthma prevalence among children of Puerto Rican heritage is 16.5 percent versus 7.1 percent for children of Mexican heritage, and thus an asthma intervention may have greater salience for some Latino subgroups.⁸⁰ Bailey and colleagues identified a small number of studies suggesting that culture-specific asthma education programs are more effective at improving asthma knowledge in children.¹³⁷ In mental health services literature, a handful of recent studies (not reviewed because they failed to meet other inclusion criteria) have included children of other racial and ethnic groups because the interventions have targeted these groups specifically (e.g., programs for refugee children, programs for those exposed to political violence).^{138,139}

If programs did identify a target population, it was generally through an economic selection (i.e., the percentage of students enrolled in a school lunch program). Selection of low-income populations does often constitute a disproportionate number of minorities, but it is not by design. Given that insurance coverage and access to healthcare vary across racial and ethnic groups, we also may expect some interventions to have larger impacts on those groups more likely to lack health insurance or a regular source of care. Programs may also be customized during implementation at a specific site, but there is no evidence in the evaluation studies.

- ***Lack of developed and tested measures for education outcomes.*** As confirmed by our search and inclusion process, relatively few studies of school-based health interventions examined educational outcomes, and of those, the most common measure was absenteeism (Tables 1–4). Although there is extensive literature on absenteeism and academic achievement,¹⁴⁰ the literature on school-based health interventions is inconclusive on absences and not connected to downstream academic outcomes. Nearly all studies in the field scan that examined absenteeism measured overall absences, or absences due to illness; however, chronic absenteeism, i.e., missing 10 percent or more days of school, is associated with the greatest consequences.¹⁴⁰ Furthermore, because numerous other factors affect education outcomes, there has

been relatively less investigation by which other pathways (and thus, interventions) may connect health and academic achievement. Given that a few studies identified improvements in grades and test scores, with no difference in absenteeism, other mechanisms should be studied. For example, Basch describes two other mechanisms by which asthma leads to poor educational outcomes: 1) sleep deprivation leading to impaired cognition, and 2) anxiety and other psychological disorders related to a lack of school connectedness.⁸³ Engelke found that for school nurse case management of asthma, GPA improved only among students whose families also reported improvements in psychosocial support, suggesting that poorly supported children may not experience the same benefits.⁹⁶

Measures for education impact should be developed according to theoretical relationships between the health programming and school goals. For example, evaluations of Fast Track included both time off-task and the hypothesized downstream outcomes, academic performance.^{63,64} Two studies demonstrated improvement in on-time school entry associated with SBHCs. These observations should then be examined for downstream outcomes associated with expected outcomes such as earlier development of reading skills, or behavioral outcomes. Although the variety of educational outcomes examined in the mental health literature is broad (e.g., academic achievement, behavioral, academic self-efficacy, attendance), the overall literature is so sparse such that there are no apparent standard target measures.¹⁴¹

- ***Weak study designs.*** With the exception of asthma management programs, most analyses utilized weak designs and did not incorporate basic methods to account for potential confounding factors, such as student characteristics. Thus, it is difficult to conclude whether many health interventions would offer substantive benefits to children in general and boys of color specifically.

OBSTACLES TO KNOWLEDGE PRODUCTION

- ***Limited funding for interventions secondarily limits the ability to conduct rigorous evaluation.*** School-based health interventions in general have struggled to identify sources of funding, particularly after the Great Recession, and those interventions that are particularly intensive (requiring investments in physical space, equipment, hiring of personnel) may be less likely to acquire adequate funding for operations, much less evaluation. Interventions that require additional healthcare professionals are typically grant-funded, and programs are not maintained after grants end.^{81,142} Conducting adequate follow-up after implementation can thus be difficult to accomplish, and many studies that identified impacts observed those one or more years after the intervention. Health interventions cannot be funded by schools and grants alone; they must be supported by local healthcare providers, public health agencies, and state and federal funding formulas.
- ***Program funding and resources are not specifically dedicated to external evaluation.*** Given that programs face challenges in funding simply to continue, it is not surprising that there is underinvestment in evaluation. In several studies, academic investigators partnered with school systems, and one study on an asthma intervention noted that study personnel implemented program components (education sessions, physician consultation) due to lack of staffing within schools.⁹¹ This not only limits long-term program sustainability but also shifts the evaluator from an external to internal perspective.
- ***Inadequate data collection and integration.*** Multiple studies referred to schools' limitations in the capacity to collect and analyze data. An evaluation of health and education outcomes often requires linking of school and healthcare data, and potentially data from other health systems. This requires not only technology infrastructure, but also human resources to manage and analyze data, and agreements across partners for sharing and storing data. In addition, many studies reported challenges with evaluating outcomes over time due to high turnover rates in schools. A few noted that outcomes may be biased toward null findings because a high percentage of children left the school prior to the end of the study.

- **Lack of alignment between research and educator goals.** Hollenbach and Cloutier note that school asthma interventions struggle because investigators fail to include educators and “end users” in design, implementation, and evaluation.¹⁴² Without an agreement on objectives and measures, schools are incentivized to document favorable outcomes that threaten the validity of education measures derived from school records. For example, Gerald noted that schools received state funding based upon attendance and academic performance records, and thus use of school data (rather than a teacher or parent reporting system) may be less reliable.⁹¹

Health interventions cannot be funded by schools and grants alone; they must be supported by local healthcare providers, public health agencies, and state and federal programs.

- **Theoretical pathways connecting health and educational outcomes are still in the early stages of investigation.** Across all program types, theoretical pathways have not been thoroughly developed; without a framework or logic model, it may not be clear how programs should benefit health or education, or what factors are relevant specifically to boys of color. For example, Strolin-Goltzman posits that the benefits of SBHCs extend beyond ready access to primary care, to increasing student connectedness (which is associated with improved academic performance).¹⁰³ However, there has been no exploration on the intersections of race and gender. In mental health services, integration across disciplines is also early in development. Education-based approaches have focused on students with developmental, behavioral, and academic problems as an indication of poor mental health, e.g., an emphasis on externalizing behaviors. At the same time, the mental health services approach focuses on diagnosed disorders and more often internalizing disorders (depression, anxiety), rather than broader outcomes such as behavior and academic achievement that would be of priority to educators. For example, the Fast Track evaluation focuses on conduct disorders, whereas if a school were to invest in mental health services, schools would also be interested in services for anxiety and depressive disorders. Regardless of condition, though, all participants should have a shared interest in education outcomes. Atkins and colleagues have proposed a framework for integration of education and mental health in schools that can agree upon problems, approaches, and desired outcomes, whether behavioral, mental health, or academic.¹⁴³ Again, the two main obstacles in generating a more robust evidence base for boys of color are the absence of theories on school-based health interventions that may be specific to boys, and the absence of theories on school-based health interventions that may be specific to children of color.
- **Study designs do not account for bidirectional or synergistic effects between health and educational interventions.** Throughout the field scan, we identified studies that examined health and education outcomes following an intervention, with few accounting for how each outcome may influence the other. Academic performance may moderate the effects of a health intervention: Lochman found that the intervention effects on main outcomes (aggressive status as perceived by other children, prosocial behavior) were stronger for children who did not have academic problems.¹³⁰ Or, health interventions that include an academic component may be more effective. Robinson and colleagues focused on reading skills to improve children’s general literacy and self-efficacy, with the proposition that this would subsequently lead to children’s self-management of asthma.¹⁴⁴ The Fast Track program for conduct disorders included both a health and academic intervention component (tutoring, parent education on academic achievement), and multiple programs described in the literature reviews also included academic supports either a priori, or in one case, after receiving feedback from educators and families.¹⁴⁵
- **Lack of coverage in appropriate journals.** Most studies are published in journals with a target audience of health workers or health educators (e.g., *Journal of School Nurses*) rather than general education journals more likely to reach education administrators and policymakers.

Discussion and Recommendations

The literature on the impact of school-based health interventions on educational outcomes is small but promising. Elementary and middle school-aged children who participate in interventions that combine multiple components (for example, physical activity and nutrition programs, or asthma education plus case management and quick-relief medication) seem most likely to achieve improvements in grades and standardized test scores as well. Unexpectedly, these gains occur with or without changes in absenteeism, suggesting that there are other mechanisms at play. However, there is almost no rigorous evaluation to show that these benefits would be seen specifically for boys of color.

GENERAL RECOMMENDATIONS FOR SCHOOL-BASED HEALTH INTERVENTIONS

1. ***Programs and investigators should target schools serving communities of color***—black/African American, American Indian and Alaska Native, Asian, Pacific Islander, Native Hawaiian, and Latino communities. Interventions can be based on established curriculum that has been shown to improve health and education outcomes, and administrators can adapt culturally appropriate programs for the community. It can be both challenging and costly to implement programs that require nuanced changes depending on the individual participant’s demographics, but culturally specific interventions may have a higher success rate, and be worth the investment and effort. National models should consider offering options to tailor programs to meet the needs of population subgroups. A notable example of school-based intervention for AI/AN is Pathways,^{146,147} and could be coupled with education evaluation in the future. By implementing programs in communities of color, programs and investigators can further examine issues and solutions that are specific to boys.
2. ***Funding organizations should require studies to include disaggregated data on racial and ethnic subgroups and gender, and when possible, include subgroup analysis of effects on special populations.*** For studies that are based in schools predominantly of one race/ethnicity, a greater discussion of lessons learned about the particular community would be beneficial for this body of research moving forward.
3. ***Funding organizations should support investment in data collection and infrastructure.*** To conduct more rigorous evaluation, schools and health providers require greater support to develop the data and personnel infrastructure to collect, manage, analyze, and share data. Enhanced capacity would facilitate collection and analyses of additional racial and ethnic subgroups.
4. ***Funding organizations should require collaboration between health programs and school administration before, during, and after implementation.*** A frequent criticism of health interventions in school has been the lack of coordination between health service providers and participating schools.¹⁴² Prior to development, the relevant stakeholders need to establish clarity on goals of the intervention, including educational benefits. Thus, use of school site and infrastructure is not merely for the convenience of health providers, but also benefits the schools by allowing focus on their educational mission. Furthermore, agreement on outcomes prior to implementation will facilitate data collection and integration for evaluation.
5. ***Investigators and funding organizations should encourage inclusion of education outcomes in evaluations of school-based health interventions.*** Establishing a health program in a school is resource-intensive, often requiring partnerships between schools, healthcare providers, community organizations, and in some cases, Medicaid and affiliated healthcare plans. Programs that can demonstrate positive impacts on education outcomes would bolster support from the education sector, both in potential funders and in academic journals.

6. ***Investigators should leverage funding from federally supported health research to support broader evaluation.*** Condition-specific funding, such as NIH funding for obesity, asthma, reproductive health, and mental illness, has supported research on SBHCs and other school-based programs. Investigators should continue to pursue these opportunities for single conditions, and then leverage study protocols and data collection processes to conduct broader investigations on the overall health and educational impact of school-based health interventions. Furthermore, the process of applying for and obtaining funding from federal agencies would encourage the development of stronger study designs.
7. ***Investigators should promote their work to journals and conferences that speak to education policy/administrative decision makers, whose focus is on student performance, rather than restricting their work to the health disciplines.*** This is important because while the administrators who make program decisions may be aware of the connection between health and learning, they may not understand the school's role in bridging this gap, or feel it is an important use of scarce school resources. However, there is evidence that investment in health can lead to the positive academic outcomes that school leaders, and the watchdogs who hold them accountable, seek.

SPECIFIC DISCUSSION AND RECOMMENDATIONS BY PROGRAM TYPE

General Health Programs

In the last few decades, education policy reform at both state and federal levels has increasingly put the focus on student performance, as evidenced by programs such as No Child Left Behind, Race to the Top, and A+ Plan (Florida). While there is an industry recognition that good health improves educational outcomes, health interventions in a school setting do not widely embrace the intersection of these two critical sectors of the life course.

- National program models should do more than acknowledge the link; they should include outcome measures in both sectors.
- Further, work should be done to provide guidance on cultural adaptation of programs for genders and ethnic groups, encouraging the implementation of programs that can then be studied.

Physical Activity and Nutrition

Overweight/obesity disproportionately affects boys of color, and although there is a reasonably large body of evidence demonstrating the successes of school-based physical activity and nutrition programs, there are no studies that examine how these programs specifically impact BMOC.

- Programs that include brief breaks of physical activity (Take10, PAAC), and afterschool programs (FitKids) should be evaluated for schools in communities of color. Limited evidence suggests these programs improve both physical activity and academic performance in general school populations, but further research to strengthen the body of evidence, particularly among Hispanics, blacks/African Americans, American Indians/Alaska Natives, and Native Hawaiians is warranted.
- Researchers should pursue studies to understand the potential value of physical activity interventions for boys to improve educational outcomes. Boys generally get more physical activity than girls throughout the day; thus, there tend to be more physical activity programs targeting girls than boys to improve their daily activity. This area of research should be developed with the introduction of rigorously designed intervention studies.
- Community involvement has been identified as an important part of preventing obesity in communities of color; thus, there might be important opportunities for schools and communities to forge partnerships.¹⁴⁸ Examples include allowing school property to be used by the public for recreation during non-school hours, and implementing comprehensive district-wide wellness policies.

Asthma Management

The current literature on efforts to target asthma in schools does not convincingly demonstrate the impact of effective asthma management on educational outcomes. Although it has long been assumed that asthma contributes to the educational achievement gap through increased absenteeism, school-based interventions do not conclusively impact missed days due to asthma or for all causes. At the same time, because some studies identified modest improvements in grades for students receiving asthma interventions, this also suggests that programs may work via pathways other than absenteeism.

- Comprehensive asthma programs that combine school nurse case management, asthma education, provision of medications, and engagement with primary care providers, appear the most promising for alleviating asthma symptoms, boosting school attendance and some limited evidence for academic performance. But, it is not clear whether these interventions may be more successful due to the high level of services provided, or whether they appear so because they have been subject to the least rigorous evaluation. These programs should be evaluated for the efficacy for racial and ethnic subgroups, and examined for potential aspects that may be tailored for boys.

School-Based Health Centers

Due to the limitations in the evidence, we are unable to estimate what impact SBHCs may provide for boys of color. SBHCs broadly offer the opportunity to benefit students by providing easily accessible healthcare services in a familiar setting, and there are a number of theoretical pathways by which SBHCs could contribute to improved educational outcomes. However, one main challenge to evaluation is that benefits from consistent access to care may require years and/or very large sample sizes in order to become detectable. For example, cumulative benefits of on-time start and reduced absences may likely benefit relatively healthy children over a period of several years, but such a long-term investigation is more difficult to fund or conduct. Alternatively, investigators may be more likely to observe impacts among specific populations, such as children who need chronic disease (e.g., asthma) management or those with other high healthcare needs that predispose them to academic underachievement.

- Organizations currently supporting SBHCs should promote the use of toolkits such as “Documenting the Link Between School-Based Health Centers and Academic Success,” developed by Soleimanpour and colleagues,¹⁴⁹ to measure the impact of their services (on both health and education outcomes).
- SBHCs should capitalize on Medicaid reimbursements to support healthcare services so that funds from other sources can be applied to developing and evaluating programs for boys of color. In 2014, SBHCs became eligible to receive Medicaid reimbursements for services delivered in schools.¹⁵⁰ Because children of color are more likely to be covered by Medicaid and face limited access to care, SBHCs in communities of color may be well positioned to obtain greater financial support for their efforts. However, participation in Medicaid-managed care contracts is an opportunity to bolster, not supplant, existing activities in prevention and health promotion.¹⁵¹

School-Based Mental Health Services

School-based mental health services have the potential to fulfill unmet needs among boys of color. Among adolescents, racial and ethnic disparities in use of mental health services are diminished among those with access to school-based care.¹¹¹ However, there remains limited evidence on mental health, much less education, outcomes, for children in general and boys of color specifically.

- Investigators and funding organizations should facilitate school and mental health services collaboration to develop a unified, consistent, and comprehensive model for the spectrum of school-based mental health programming and agreed-upon outcomes. The evidence in the education literature suggests that benefits arise from comprehensive, longitudinal programs that incorporate school-based mental health professionals, school climate, classroom programs, and family interventions simultaneously. Thus, access to on-site mental health professionals may be insufficient in the absence of a larger, more comprehensive initiative.

- Investigators should consist of interdisciplinary teams that likewise pursue cross- disciplinary sources of external funding. The Conduct Problems Prevention Group that conducted the Fast Track evaluation was supported for over a decade from a variety of agencies, including National Institutes of Mental Health and the Department of Education. Interdisciplinary teams can capitalize on knowledge and relationships for a variety of funding sources.
- Schools, healthcare providers, and community mental health organizations should explore mutually beneficial partnerships. As noted above for SBHCs, schools are now eligible for Medicaid reimbursement for health services provided on-site, including mental and behavioral health services.

Additional Considerations

The target of this field scan was young and middle children (ages 5 to 12 years old), with interventions conducted primarily in elementary and occasionally middle schools. However, there exist notable disparities in access and use of early care and education by race/ethnicity. Latino and American Indian/Alaska Native children are the least likely to be enrolled in early education programs compared to their white counterparts: According to the US National Center for Education Statistics, in 2014, 32 percent of Latino/Hispanic children, 31 percent of American Indian/Alaska Native children, and 39 percent of black children were enrolled in preschool, compared to 41 percent of white children, and 40 percent of Asian children.¹⁵² Obtaining a high-quality early childhood education and care experience is challenged by low and inconsistent quality of early education.^{153,154} Quality early education in the earliest years of life has been shown to relate to positive developmental outcomes for school readiness, including improved early academic skills, socioemotional competencies, and cognitive functioning.¹⁵⁵ As with quality in early education and care, quality in healthcare for children also has lifelong implications, but has been shown to vary by race/ethnicity. For example, black/African American and Latino children in the United States receive fewer preventive and other healthcare visits, and are less likely to have health insurance, receive regular medical checkups, and have a primary medical provider.^{156–157}

Conclusion

The state of the literature on evaluation studies for young boys of color in the area of health and education is emerging but limited. The limitations arise from several sources: First, few programs specifically target BMOC. More often, programs target children based on socioeconomic factors associated with school funding (i.e., schools with high levels of free and reduced lunch programs) rather than on specific racial and ethnic populations. Because children of color are disproportionately socioeconomically disadvantaged, boys of color may be more likely to participate in these programs. However, the second limitation is that, of the studies conducted, very few analyze boys, children of color, and least of all, boys of color, specifically. Third, with the exception of condition- or disease-specific funding, there appear to be relatively limited resources for external evaluation of programs. Lastly, of the programs we evaluated, there is an acknowledgment of the connection between health and education, but most only target health outcomes.

Consequently, there is little robust evidence to base recommendations with confidence on programs that can simultaneously improve the health and education of boys of color. When there is evidence in the scientific literature, it is primarily published for a healthcare, not education administration, audience. There is great potential for public health and healthcare providers to work with schools to positively impact the lives of boys of color. Health professionals and community health organizations can work with education administrators and policymakers to develop programs that are understood to be mutually beneficial. Programs can take advantage of the funding available in health research and healthcare to go further—to reach a broader population, to deliver services beyond those for a single need or condition, and to identify the best strategies for improving both health and education. For BMOC, the emphasis should not be an either/or; rather it should involve both health and education. Finally, the limitation of an absence of academic measures in study design may be the easiest to remedy, as schools involved in the interventions will also have data on academic outcomes for analysis. Funders can encourage this study design in their calls for grant proposals, setting off a cycle that can lead to more researchers incorporating academic measures, reporting on the links in peer-reviewed literature, thus expanding the field of work that impacts health in schools to improve student learning outcomes.

APPENDIX 1

TABLE 1 KEY EVALUATION STUDIES IDENTIFIED IN THE FIELD SCAN OF PHYSICAL ACTIVITY AND NUTRITION SCHOOL-BASED INTERVENTIONS

AUTHOR	TITLE	JOURNAL	DATE	POPULATION	TYPE OF STUDY	EDUCATION OUTCOMES
PHYSICAL ACTIVITY						
Caterino, M.	Effects of two types of activity on the performance of second, third, and fourth grade students on a test of concentration	Percept Mot Skills	1999	N= 177; boys & girls unknown race/ethnicity, 2nd-4th grade	Cross-sectional	Concentration improved after engaging in physical activity among 4th graders Sallis, J.
Sallis, J.	Effects of health-related physical education on academic achievement: project SPARK	Res Q Exerc Sport	1999	N=759; boys & girls, unknown race/ethnicity, K-5th grade	RCT	Physical education did not have harmful effects on standardized test scores; modest improvement
Crews, D.	Aerobic physical activity effects on psychological well-being in low-income Hispanic children	Percept Mot Skills	2004	N=66, boys & girls, all Hispanic, 8-10 yrs	RCT	Improvement in self-esteem and depression; not academic
Mahar, M.	Effects of a classroom-based program on physical activity and on-task behavior (Energizers)	Med Sci Sports Exerc	2006	N=243; boys & girls, unknown race/ethnicity, 3rd-4th grade	RCT	Improved on-task behavior in classroom
Donnelly, J.	Physical Activity Across the Curriculum (PAAC): a randomized controlled trial to promote physical activity and diminish overweight and obesity in elementary school children	Prev Med	2009	N=1,527; boys & girls, 77.4% white, 6.2% African American, 10.1% Hispanic, 1.6% Native American, 1.2% Asian, 3.6% Multi5Ethnic, 2nd-5th grade	RCT	Improved academic achievement as measured by the Wechsler Individual Achievement Test - 2nd Edition (WIAT-II)
Reed, J.	Examining the impact of integrating physical activity on fluid intelligence and academic performance in an elementary school setting: a preliminary investigation	J Phys Act Health	2010	N=155, boys & girls, unknown race/ethnicity, 7-10 yrs	Follow-up	Improved scores on social sciences standardized test. Improved scores in English, math, and science, but not statistically significant
Rhemtulla, M.	Correlated longitudinal changes across linguistic, achievement, and psychomotor domains in early childhood: evidence for a global dimension of development ECLS-B	Dev Sci	2011	N=10,200; boys and girls, 41.4% white, 15.9% African American, 20.5% Hispanic, 11.3% Asian, 10.8% other, (4-7 yrs)	Cross-sectional	Improvements in several cognitive and motor skill measures
Palmer, K.	Acute exercise enhances preschoolers' ability to sustain attention	J Sport Exerc Psychol	2013	N=16; boys and girls, unknown race/ethnicity, 3-4 yrs	Cross-sectional	Improvements in ability to sustain attention
Hillman, C.	Effects of the FITKids randomized controlled trial on executive control and brain function	Pediatrics	2014	N=121; boys and girls, 47% white, 23% African American, 9% Hispanic, 15% Asian, 15% Other, 7-9 yrs	RCT	Improvements in cognitive performance and brain function during test tasks that required greater executive control
Krafft, C.	An 8-month randomized controlled exercise trial alters brain activation during cognitive tasks in overweight children	Obesity	2014	N=43 (overweight); boys & girls, 91% African American, 8-11 yrs	RCT	Improvement in antisaccade and flanker, two cognitive control tasks during functional magnetic resonance imaging (fMRI)

AUTHOR	TITLE	JOURNAL	DATE	POPULATION	TYPE OF STUDY	EDUCATION OUTCOMES
PHYSICAL ACTIVITY						
Goh, T.	Effects of a Take10 classroom-based physical activity intervention on third- to Fifth-grade children's on-task behavior	J Phys Act Health	2016	N=210; boys & girls, 57% white, 35% Hispanic, 5% Pacific Islander, 3% Other 3rd-5th grade	RCT	Improvements in on-task behavior
Kibbe, D.	Ten years of TAKE 10((R)): Integrating physical activity with academic concepts in elementary school classrooms	Prev Med	2011	Review of Take 10! Studies, boys & girls, no mention of race/ethnicity 5-11 yrs	Various	Systematic Review that includes various educational outcomes, from standardized testing to on-task behavior
Tsai, P.	Lessons learned in using TAKE 10! with Hispanic children	J Sch Nurs	2009	N=840; boys & girls, 92% Hispanic, K-6th grade	Non-randomized intervention	Improvements in student knowledge regarding the importance of physical activity, nutrition, and Self-reported concentration
NUTRITION						
Frisvold, D.	Nutrition and cognitive achievement: An evaluation of the school breakfast program	J Public Econ	2015	N approx. 5,000; boys & girls, 60% white, 24% African American, 12% Hispanic	Quasi experimental State mandates and student achievement data, Difference in Difference	Improvement in cognitive assessment scores in math and reading
Corcoran, S.	The effect of breakfast in the classroom on obesity and academic performance: Evidence from new york city	J Policy Anal Manage	2016	N approx. 700,000 (for grades 4-5), boys & girls; 15% white, 34% African American, 39% Hispanic, 12% Asian	Quasi experimental - NYC admin and student data, Difference in Difference	Breakfast in the classroom increased school breakfast participation, but no impact on BMI, academic performance, or school attendance
Anzman-Frasca, S.	Estimating impacts of a breakfast in the classroom program on school outcomes	JAMA Pediatr	2015	N approx. (24 public elementary schools) with and without breakfast program (BIC); for BIC schools: 85% Latino, 8% African American, 3% white, 2% Asian	Observational study; generalized linear mixed models to estimate impact of BIC on outcomes	Improved school attendance, however no significant differences in standardized math or reading scores

TABLE 2 KEY EVALUATION STUDIES IDENTIFIED IN THE FIELD SCAN OF SCHOOL-BASED ASTHMA MANAGEMENT INTERVENTIONS

AUTHOR	TITLE	JOURNAL	DATE	POPULATION	TYPE OF STUDY	EDUCATION OUTCOMES
ASTHMA EDUCATION						
Cicutto, L.	Breaking the access barrier: Evaluating an asthma center's efforts to provide education to children with asthma in schools	Chest	2005	N=239; boys & girls; race/ethnicity unknown, 2nd–5th grade	Cluster RCT, Pre5post 1 year	Fewer absences
Clark, N.	Effects of a comprehensive school-based asthma program on symptoms, parent management, grades, and absenteeism	Chest	2004	N=674; boys & girls, 98% African American, 2nd–5th grade	Cluster RCT, Pre-post 24 mos	No difference in absences; Improved science grades; not math or reading
Evans, D.	A school health education program for children with asthma aged 8–11 years	Health Educ Q	1987	N=239; boys & girls, 70% Hispanic, 28% Black; 3rd grade–5th grade	Cluster RCT, matched schools, Pre- post 1 year	No difference in absences; Improved grades in math, science, oral expression
Horner, S.	Effect of education on school-age children's and parents' asthma management	J Specialists in Pediatric Nursing	2004	N=44; boys & girls, 41% African American, 23% Mexican American, 3rd–5th grade	Cluster RCT, 6 & 12 mos follow-up	Fewer absences, not statistically significant
Persaud, D.	An asthma self-management program for children, including instruction in peak flow monitoring by school nurses	J Asthma	1996	N=36, boys & girls, 69% African American, 8–12 yrs	RCT	Fewer absences, not statistically significant
Clark, N.	An evaluation of asthma interventions for preteen students	J School Health	2010	N=876, boys & girls, 93% African American, 10–13 yrs	Cluster RCT, 12 & 24 mos	GPA improved over 24 months
Gerald, L.	Increasing adherence to inhaled steroid therapy among schoolchildren: Randomized, controlled trial of school-based supervised asthma therapy	Pediatrics	2009	N=256, boys & girls, 91% African American, 9–12 yrs	RCT post 12 mos	No difference in absences
Velsor-Friedrich, B.	The effects of a school-based intervention on the self-care and health of African American inner-city children with asthma	J Pediatric Nurs	2004	N=102, boys & girls, 100% African American, 8-13 yrs	Pre-post 2 wks & 5 mos, non- equivalent comparison group	Fewer absences, not statistically significant
DePue, J.	Providence school asthma partnership: School-based asthma program for inner-city families	J Asthma	2007	N=972, 74% Latino, boys & girls, 9% African American, 5–11 yrs	Pre-post 12 mos	Fewer absences
Robinson, L.	The impact of literacy enhancement on asthma-related outcomes among underserved children	J Natl Med Assoc	2008	N=110, boys & girls, 80% African American, 22% Hispanic, 6–14 yrs	Pre-post 6 mos	Improved reading levels
Magzamen, S.	Kickin' asthma: Schoolbased asthma education in an urban community	J School Health	2008	N=990; boys & girls, 45% African American, 31% Latino, 17% Asian, middle & high schools	Pre-post 3 mos	Fewer absences
CASE MANAGEMENT						
Levy, M.	The efficacy of asthma case management in an urban school district in reducing school absences and hospitalizations for asthma	J School Health	2006	N=243; boys & girls, 97% African American; 65 10 years	Cluster RCT, 1 & 2yr follow-up	Fewer absences
Taras, H.	Impact of school nurse case management on students with asthma	J School Health	2004	N=1094, 41% Hispanic, 17% Asian, 15% African American; ages unknown	Pre-post 3 yrs, Non-equivalent comparison group	No difference in absences

AUTHOR	TITLE	JOURNAL	DATE	POPULATION	TYPE OF STUDY	EDUCATION OUTCOMES
CASE MANAGEMENT						
Rodriguez, E.	School nurses' role in asthma management, school absenteeism, and cost savings: A demonstration project	J School Health	2004	N=1094, 41% Hispanic, 17% Asian, 15% African American; ages unknown	Pre-post 3 yrs, Non-equivalent comparison group	No difference in absences
Engelke, M.	School nurse case management for children with chronic illness: Health, academic, and quality of life outcomes	J School Nursing	2008	N=114, boys & girls, 54% of African American, 5-19 yrs	Pre-post, 1 academic year	GPA and math/reading scores improved for children with low scores (not tested for statistical significance)
Engelke, M.	Process and outcomes of school nurse case management for students with asthma	J School Nursing	2014	N=143, boys & girls, 38% African American, 7% Latino, 14% other, 1st-12th grade	Pre-post 1 yr	No significant difference in GPA; GPA improved if family psychosocial support also improved; Decrease in parent-reported tardiness
Morrice, M.	School asthma screening and case management: Attendance and learning outcomes	J School Nursing	2013	N=142, boys & girls, 97% Hispanic, 7-12 yrs	Pre-post 2 yrs, Non-equivalent comparison group	No significant differences in test scores; fewer absences due to all-cause illness
ASTHMA MEDICATIONS						
Halterman, J.	Randomized controlled trial to improve care for urban children with asthma: Results of the School-Based Asthma Therapy trial	Arch Pediatr Adolesc Med	2011	N=350, boys & girls, 63% black, 28% Hispanic, 3-10 yrs	RCT, monthly for winter season	Fewer absences
Gerald, J.	Availability of asthma quick relief medication in five Alabama school systems	Pediatr Allergy Immunol Pulmonol	2012	N=290, boys & girls, 91% black, mean age 11	Cross-sectional	No difference in absences due to respiratory illness
Halterman, J.	Benefits of a school-based asthma treatment program in the absence of secondhand smoke exposure: Results of a randomized clinical trial	Arch Pediatr Adolesc Med	2004	N=180, boys & girls, 59% black, 32% Hispanic, 3-7 years	RCT, monthly for 1 academic yr	Fewer absences
ASTHMA CARE / CONSULTING MD						
Velsor-Friedrich, B.	A practitioner-based asthma intervention program with African American inner-city school children	J Pediatr Health Care	2005	N=52, boys & girls, 100% African American, 8-13 yrs	Cluster RCT, 2 wk, 5 mos, 12 mos	Fewer absences, not statistically significant
Lurie, N.	Asthma outcomes at an inner-city school-based health center	J Sch Health	2001	N=67; boys & girls, 60% African American, 7% Hispanic, 15% American Indian, pre-school-8th grade	Pre-post 9 months	No differences in asthma-related absences
Liao, O.	The Breathmobile: A novel comprehensive school-based mobile asthma care clinic for urban underprivileged children	J School Health	2006	N=1112, boys & girls, 81% Latino, 0-18 yrs	Post-only, 1 year	Fewer absences
Patel, B.	Success of a comprehensive school-based asthma intervention on clinical markers and resource utilization for inner-city children with asthma in Chicago: the Mobile C.A.R.E. Foundation's asthma management program	J Asthma	2007	N=677, boys & girls, 40% African American, 56% Latino, 0-18 yrs	Observational, Retrospective cohort	No difference in absences
Webber, M.	Burden of asthma in inner-city elementary schoolchildren: Do school-based health centers Adolesc Med make a difference?	Arch Pediatr Adolesc Med	2003	N=949; boys and girls, 59% Latino, 18% African American, K-5th grade	Cross-sectional, 4 intervention & 2 comparison group	Fewer absences

AUTHOR	TITLE	JOURNAL	DATE	POPULATION	TYPE OF STUDY	EDUCATION OUTCOMES
ASTHMA CARE / CONSULTING MD						
Richmond, C.	Asthma 411- addition of a consulting physician to enhance school health	J School Health	2006	N=912 YR1; N=1024 YR2, boys & girls, 95% African American, K- 12th grade	Cross- sectional time series	Fewer absences
Wilson, K.	Examining the consulting physician model to enhance the school nurse role for children with asthma	J School Health	2009	N=5094 YR1- 2; N=5125 YR 3; boys & girls; 95% African American, K- 6th grade	Cross- sectional time series	Fewer absences and fewer times sent home
COMPREHENSIVE PROGRAM						
Bartholomew, L.	Partners in school asthma management: Evaluation of a self-management program for children with asthma	J School Health	2006	N=493, boys & girls, 45% African American, 51% Hispanic, elementary schools	Cluster RCT, 3yrs	No differences in "basic" group; "Enhanced group": fewer absences, higher grades on English language arts, science, social studies
Gerald, L.	Outcomes for a comprehensive school-based asthma management program	J School Health	2006	N=610; boys & girls, 97% African American; elementary school	Cluster RCT, delayed and immediate, over 3 years	Fewer absences and higher grades, not statistically significant
Splett, P.	Evaluation and sustainability of the Healthy Learners Asthma Initiative	J School Health	2006	N=1561, boys & girls, 66% African American, 6% Hispanic, 5% American Indian, 3% Asian, K-8th grade	Cluster RCT, 2 years	Fewer absences among children who received asthma care at school
Liptzin, D.	Developing, implementing, and evaluating a School-centered asthma program: Step5Up Asthma Program	J Allergy Clin Immunol Pract	2016	N=252; boys & girls; unable to obtain further detail on population	Pre-post, 2 yrs	Fewer absences
Carpenter, L.	Sustaining school-based asthma interventions through policy and practice change (Childhood Asthma Linkages in Missouri (CALM))	J School Health	2013	N=330; boys & girls, race/ethnicity unknown, 0-19 yrs	Pre-post, 2 yrs	Fewer absences

TABLE 3 KEY EVALUATION STUDIES IDENTIFIED IN THE FIELD SCAN OF SCHOOL-BASED HEALTH CENTERS

AUTHOR	TITLE	JOURNAL	DATE	POPULATION	TYPE OF STUDY	EDUCATION OUTCOMES
Cicutto, L.	Delivering health care to children on their turf: An elementary school-based wellness center	J Pediatr Health Care	2001	N~397 per year; boys & girls; 82% African American, 10% Other nonwhite, 3rd–5th grade	Cluster RCT, Pre5post 1 year	Fewer absences, uneven reading/math, test scores, not tested for statistical significance
Foy, J.	School-based health centers: A four year experience, with a focus on reducing student exclusion rates	Osteopath Med Prim Care	2009	N=1300-1400 per year ; boys & girls; 21% African American, 27% Hispanic, 28% Asian), new 1st grade	Cluster RCT, Pre-post 24 mos	Fewer first-grade exclusions
Klostermann, B.	Quality improvement in a school health program: Results of a process evaluation	Evaluation & the Health Professions	2000	N ~2800 per year; boys & girls, race/ethnicity unknown, K–12th grade	Time series, serial cross-section, pre-post 2 years	Fewer absences, fewer times sent home
Young, T.	Impact of a school-based health center on emergency department use by elementary school students	J Sch Health	2001	N=216; boys & girls, 60% African American, 5–12 yrs	Pre-post 1 year	Fewer non-urgent ED visits on school days
Webber, M.	Burden of asthma in inner-city elementary schoolchildren: Do school-based health centers make a difference?	Arch Pediatr Adolesc Med	2001	N=949; boys and girls, 59% Latino, 18% African American, K–5th grade	Cross-sectional, 4 intervention & 2 comparison group	Fewer absences among children with and without asthma
Strolin-Goltzman, J.	Understanding the relationship between school-based health center use, school connection, and academic performance	Health Soc Work	2014	N=791 (273 elementary) boys and girls, ~21% African American/black, 60% Hispanic, 5% Asian, 1% Native American, 4% Multi-racial, K–12th grade	Cross-sectional	No difference in absences; SBHC users: Higher GPA, rate of promotion
Strolin-Goltzman, J.	The relationship between school based health centers and the learning environment	J School Health	2010	N=208 schools (mean 711 students/school); boys and girls, ~52% Hispanic, 37% black, 5% Asian, 0.4% Native American, 6th– 12th grade	Cross-sectional	Higher student and parent ratings on school engagement and academic expectations

TABLE 4 EVALUATION STUDIES IDENTIFIED IN THE FIELD SCAN OF SCHOOL-BASED MENTAL HEALTH SERVICES

AUTHOR	TITLE	JOURNAL	DATE	POPULATION	TYPE OF STUDY	EDUCATION OUTCOMES
Bierman, K. (Conduct Problems Prevention Group)	The effects of the Fast Track program on serious problem outcomes at the end of elementary school	J Clin Child Adolesc Psychol	2004	N=891; boys & girls, 51% African American, K-5th grade	Matched pairs, post 6 yrs	Improved behavioral and academic measures (composite of test scores, grades, reading, retention, failure in reading/math) in 3rd grade disappeared by grades 4 & 5
King, C.	An experimental evaluation of a school-based program for children at risk: Wisconsin Early Intervention	Journal of Community Psychology	1990	N=135; boys & girls, race/ethnicity unknown, K-4th grade	Cluster RCT	No difference in teacher-reported learning problems
Stein, B.	A mental health intervention for schoolchildren exposed to violence: A randomized controlled trial	JAMA	2003	N=126; boys & girls; students of color included, not quantified, 6th grade	RCT, 3 and 6 mos	No difference in teacher-reported learning or acting out problems
Bloomquist, M.	Effects of a school-based cognitive-behavioral intervention for ADHD children	J Abnorm Child Psychol	1991	N= 52; boys & girls; 5% non-white, 1st-4th grade	Cluster RCT, 6 and 10 wks	Reduced off-task and disruptive behavior, marginal statistical significance
Lochman, J.	Effectiveness of a social relations intervention program for aggressive and nonaggressive, rejected children	J Consult Clin Psychol	1993	N=52, boys & girls, 100% African American, 4th-8th grade	RCT, post 1yr	Behavioral improvements specific to children already deemed "academically adequate" prior to intervention
Daly, B.	Three-year longitudinal study of school behavior and academic outcomes: Results from a comprehensive expanded school mental health program	Advances in School Mental Health Promotion	2014	N=178, boys & girls, 10% American Indian, 63% African American, 23% Hispanic, 1% Asian, K-8th grade	Pre-post, matched comparison group, 1 year	No differences in chronic absenteeism, reading or math scores
Jennings, J.	Implementing and maintaining school-based mental health services in a large, urban school district	J School Health	2000	N=84; boys & girls, 36% African American, 49.5% Hispanic, 5% Other nonwhite, K-12th grade	Pre-post 1 year	Fewer absences, failures, disciplinary referrals

References

- Rossin-Slater, M. 2015. "Promoting Health in Early Childhood." *Future of Children* 25(1): 35-64.
- Sirinides, P., J. W. Fantuzzo, W. LeBoeuf, K. M. Barghaus, & R. Fink. 2015. *An Inquiry into Pennsylvania's Keystone STARS: Research Report*. Philadelphia: Consortium for Policy Research in Education.
- Olshansky, S. J., T. Antonucci, & L. Berkman et al. 2012. "Differences in Life Expectancy Due to Race and Educational Differences Are Widening, and Many May Not Catch Up." *Health Affairs* 31(8): 1803-13.
- Escalante, Y., A. Garcia-Hermoso, K. Backx, & J. M. Saavedra. 2014. "Playground Designs to Increase Physical Activity Levels During School Recess: A Systematic Review." *Health Education & Behavior* 41(2): 138-44.
- Sawka, K. J., G. R. McCormack, A. Nettel-Aguirre, P. Hawe, & P. K. Doyle-Baker. 2013. "Friendship Networks and Physical Activity and Sedentary Behavior Among Youth: A Systematized Review." *International Journal of Behavioral Nutrition & Physical Activity* 10: 130.
- Bethell, C. D., P. Newacheck, E. Hawes, & N. Halfon. 2014. "Adverse Childhood Experiences: Assessing the Impact on Health and School Engagement and the Mitigating Role of Resilience." *Health Affairs (Millwood)* 33(12): 2106-115.
- "School Poverty United States." National Equity Access. Available at: http://nationalequityatlas.org/indicators/School_poverty. 2016.
- Chandler, A. 2014. *A Life Course Framework for Improving the Lives of Boys and Men of Color*. Forward Change Consulting. [http://www.gih.org/files/AudioConf/Building%20a%20Movement%20\(Abbreviated\).pdf](http://www.gih.org/files/AudioConf/Building%20a%20Movement%20(Abbreviated).pdf).
- Woolf, S. H., R. E. Johnson, R. L. Phillips, & M. Philipsen. 2007. "Giving Everyone the Health of the Educated: An Examination of Whether Social Change Would Save More Lives than Medical Advances." *American Journal of Public Health* 97(4): 679-83.
- Chiang, R. J., W. Meagher, & S. Slade. 2015. "How the Whole School, Whole Community, Whole Child Model Works: Creating Greater Alignment, Integration, and Collaboration Between Health and Education." *Journal of School Health* 85(11): 775-84.
- Derzon, J. H., P. Yu, & B. Ellis et al. 2012. "A National Evaluation of Safe Schools/Healthy Students Initiative: Outcomes and Influences." *Evaluation and Program Planning* 35(2): 293-302.
- Galemore, C. A., B. Bowlen, L. G. Combe, L. Ondeck, & J. Porter. 2016. "Whole School, Whole Community, Whole Child—Calling School Nurses to Action." *NASN School Nurse (Print)* 31(4): 216-23.
- Harris, E., J. McFarland, W. Siebold, R. Aguilar, & A. Sarmiento. 2007. "Universal Prevention Program Outcomes." *Journal of School Violence* 6(2): 75-91.
- Hunt, P., L. Barrios, S. K. Telljohann, & D. Mazyck. 2015. "A Whole School Approach: Collaborative Development of School Health Policies, Processes, and Practices." *Journal of School Health* 85(11): 802-809.
- Lewallen, T. C., H. Hunt, W. Potts-Datema, S. Zaza, & W. Gile. 2015. "The Whole School, Whole Community, Whole Child Model: A New Approach for Improving Educational Attainment and Healthy Development for Students." *Journal of School Health* 85(11): 729-39.
- Merrill, M. L., N. L. Taylor, & A. J. Martin et al. 2012. "A Mixed-Method Exploration of Functioning in Safe Schools/Healthy Students Partnerships." *Evaluation & Program Planning* 35(2):280-86.
- Modzeleski, W., A. Mathews-Younes, & C. G. Arroyo et al. 2012. "An Introduction to the Safe Schools/Healthy Students Initiative." *Eval Program Plann* 35(2): 269-72.
- Morse, L. L., & D. D. Allensworth. 2015. "Placing Students at the Center: The Whole School, Whole Community, Whole Child Model." *J Sch Health* 85(11): 785-94.
- Murray, S. D., J. Hurley, & S. R. Ahmed. 2015. "Supporting the Whole Child Through Coordinated Policies, Processes, and Practices." *J Sch Health* 85(11): 795-801.
- Raspberry, C. N., S. Slade, D. K. Lohrmann, & R. F. Valois. 2015. "Lessons Learned from the Whole Child and Coordinated School Health Approaches." *J Sch Health* 85(11): 759-65.
- Rollison, J., G. Hill, & P. Yu et al. 2012. "Evaluation of a Complex, Multisite, Multilevel Grants Initiative." *Eval Program Plann* 35(2):273-79.
- Rooney, L. E., D. M. Videto, & D. A. Birch. 2015. "Using the Whole School, Whole Community, Whole Child Model: Implications for Practice." *J Sch Health* 85(11): 817-23.
- Sprague, J., V. Nishioka, & S. G. Smith. 2007. "Safe Schools, Positive Behavior Supports, and Mental Health Supports." *Journal of School Violence* 6(2): 93-115.
- Rosas, S., J. Case, & L. Tholstrup. 2009. "A Retrospective Examination of the Relationship Between Implementation Quality of the Coordinated School Health Program Model and School-Level Academic Indicators Over Time." *J Sch Health* 79(3): 108-15.
- Ogden, C. L., M. D. Carroll, & H. G. Lawman et al. 2016. "Trends in Obesity Prevalence Among Children and Adolescents in the United States, 1988-1994 Through 2013-2014." *JAMA* 315(21): 2292-99.
- Pan, L., L. C. McGuire, H. M. Blanck, A. L. May-Murriel, & L. M. Grummer-Strawn. 2015. "Racial/Ethnic Differences in Obesity Trends Among Young Low-Income Children." *American Journal of Preventive Medicine* 48(5): 570-74.
- Behavioral Risk Factor Surveillance System. 2015. Available at: <https://chronicdata.cdc.gov/Behavioral-Risk-Factors/BRFSS-Graph-of-Current-Adult-Obesity-Prevalence-By/xtew-z72g/data>
- U.S. Department of Health and Human Services Office of Minority Health. "Profile: Native Hawaiians/Pacific Islanders." Available at: <http://minorityhealth.hhs.gov/omh/browse.aspx?lvl=3&lvlid=65>.
- Kranz, S., J. L. Findeis, & S. S. Shrestha. 2008. "Use of the Revised Children's Diet Quality Index to Assess Preschooler's Diet Quality, Its Sociodemographic Predictors, and Its Association with Body Weight Status." *Journal of Pediatrics* 84(1): 26-34.
- Reedy, J., & S. M. Krebs-Smith. 2010. "Dietary Sources of Energy, Solid Fats, and Added Sugars Among Children and Adolescents in the United States." *Journal of the American Dietetic Association* 110(10): 1477-84.
- Beets, M. W., D. Bornstein, M. Dowda, & R. R. Pate. 2011. "Compliance with National Guidelines for Physical Activity in U.S. Preschoolers: Measurement and Interpretation." *Pediatrics* 127(4): 658-64.

32. Sisson, S. B, T. S. Church, & C. K. Martin. 2009. "Profiles of Sedentary Behavior in Children and Adolescents: The US National Health and Nutrition Examination Survey, 2001-2006." *International Journal of Pediatric Obesity* 4(4): 353-59.
33. U.S. Department of Health and Human Services (DHHS). 2008. *2008 Physical Activity Guidelines for Americans*. Washington, DC: U.S. Government Printing Office.
34. Belcher, B. R., D. Berrigan, K. W. Dodd, B. A. Emken, C. P. Chou, & D. Spruijt-Metz. 2010. "Physical Activity in U.S. Youth: Effect of Race/Ethnicity, Age, Gender, and Weight Status." *Medicine & Science in Sports & Exercise* 42(12): 2211-21.
35. Wang, Y., & M. A. Beydoun. 2007. "The Obesity Epidemic in the United States—Gender, Age, Socioeconomic, Racial/Ethnic, and Geographic Characteristics: A Systematic Review and Meta-Regression Analysis." *Epidemiologic Reviews* 29: 6-28.
36. Carlson, S. A., J. E. Fulton, S. M. Lee, L. M. Maynard, D. R. Brown, H. W. Kohl III, & W. H. Dietz. 2008. "Physical Education and Academic Achievement in Elementary School: Data from the Early Childhood Longitudinal Study." *American Journal of Public Health* 98(4): 721-27.
37. Carson, R. L., D. M. Castelli, A. Beighle, & H. Erwin. 2014. "School-Based Physical Activity Promotion: A Conceptual Framework for Research and Practice." *Child Obes* 10(2): 100-06.
38. Carson, V., N. Kuzik, S. Hunter, S. A. Wiebe, J. C. Spence, A. Friedman, M. S. Tremblay, L. G. Slater, & T. Hinkley. 2015. "Systematic Review of Sedentary Behavior and Cognitive Development in Early Childhood." *Prev Med* 78: 115-22.
39. Welk, G. J., A. W. Jackson, J. R. Morrow Jr., W. H. Haskell, M. D. Meredith, K. H. Cooper. 2010. "The Association of Health-Related Fitness with Indicators of Academic Performance in Texas Schools." *Res Q Exerc Sport* 81(3 Suppl): S16-23.
40. Mahar, M. T., S. K. Murphy, D. A. Rowe, J. Golden, A. T. Shields, & T. D. Raedeke. 2006. "Effects of a Classroom-Based Program on Physical Activity and On-Task Behavior." *Med Sci Sports Exerc* 38(12): 2086-94.
41. Rasberry, C. N., S. M. Lee, L. Robin, B. A. Laris, L. A. Russell, K. K. Coyle, & A. J. Nihiser. 2011. "The Association Between School-Based Physical Activity, Including Physical Education, and Academic Performance: A Systematic Review of the Literature." *Prev Med* 52(Suppl 1): S10-20.
42. Bogart, L. M., M. N. Elliott, B. O. Cowgill, D. J. Klein, J. Hawes-Dawson, K. Uyeda, & M. A. Schuster. 2016. "Two-Year BMI Outcomes from a School-Based Intervention for Nutrition and Exercise: A Randomized Trial." *Pediatrics* 137(5).
43. Lavelle, H. V., D. F. Mackay, & J. P. Pell. 2012. "Systematic Review and Meta-Analysis of School-Based Interventions to Reduce Body Mass Index." *J Public Health (Oxf)* 34(3): 360-69.
44. Mei, H., Y. Xiong, S. Xie, S. Guo, Y. Li, B. Guo, & J. Zhang. 2016. "The Impact of Long-Term School-Based Physical Activity Interventions on Body Mass Index of Primary School Children - A Meta-Analysis of Randomized Controlled Trials." *BMC Public Health* 16: 205.
45. Williams, A. J., W. E. Henley, C. A. Williams, A. J. Hurst, S. Logan, & K. M. Wyatt. 2013. "Systematic Review and Meta-Analysis of the Association Between Childhood Overweight and Obesity and Primary School Diet and Physical Activity Policies." *Int J Behav Nutr Phys Act* 10:101.
46. Centers for Disease Control and Prevention (CDC). 2010. *The Association Between School-Based Physical Activity, Including Physical Education, and Academic Performance*. Atlanta, GA: U.S. Department of Health and Human Services.
47. U.S. Department of Health and Human Services. Physical Activity Guidelines Advisory Committee Report. Washington, DC: U.S. Department of Health and Human Services; 2008.
48. Basch, C. E. 2011. "Breakfast and the Achievement Gap Among Urban Minority Youth." *Journal of School Health* 81(10): 635-40.
49. Trudeau, F., R. J. Shepard. 2008. "Physical Education, School Physical Activity, School Sports and Academic Performance." *Int J Behav Nutr Phys Act* 5(10).
50. Tandon, P. S., A. Tovar, A. T. Jayasuriya, E. Welker, D. J. Schober, K. Copeland, D. A. Dev, A. L. Murriel, D. Amso, & D. S. Ward. 2016. "The Relationship Between Physical Activity and Diet and Young Children's Cognitive Development: A Systematic Review." *Prev Med Rep* 3: 379-90.
51. Singh, A., L. Uijtendewilligen, J. W. Twisk, W. van Mechelen, & M. J. Chinapaw. 2012. "Physical Activity and Performance at School: A Systematic Review of the Literature Including a Methodological Quality Assessment." *Arch Pediatr Adolesc Med* 166(1): 49-55.
52. Norris, E., N. Shelton, S. Dunsmuir, O. Duke-Williams, & E. Stamatakis. 2015. "Physically Active Lessons as Physical Activity and Educational Interventions: A Systematic Review of Methods and Results." *Prev Med* 72: 116-25.
53. Mura, G., M. Vellante, A. E. Nardi, S. Machado, & M. G. Carta. 2015. "Effects of School-Based Physical Activity Interventions on Cognition and Academic Achievement: A Systematic Review." *CNS Neurol Disord Drug Targets* 14(9): 1194-208.
54. Donnelly, J. E., C. H. Hillman, D. Castelli, J. L. Etnier, S. Lee, P. Tomporowski, K. Lambourne, & A. N. Szabo-Reed. 2016. "Physical Activity, Fitness, Cognitive Function, and Academic Achievement in Children: A Systematic Review." *Med Sci Sports Exerc* 48(6): 1197-222.
55. Bustamante, E. E., C. F. Williams, & C. L. Davis. 2015. "Physical Activity Interventions for Neurocognitive and Academic Performance in Overweight and Obese Youth: A Systematic Review." *Pediatr Clin North Am* 63(3): 459-80.
56. Alvarez-Bueno, C., C. Pesce, I. Caverro-Redondo, M. Sanchez-Lopez, M. J. Pardo-Guijarro, V. Martinez-Vizcaino. 2016. "Association of Physical Activity with Cognition, Metacognition and Academic Performance in Children and Adolescents: A Protocol for Systematic Review and Meta-Analysis." *BMJ Open* 6(6): e011065.
57. Lees, C., & J. Hopkins. 2013. "Effect of Aerobic Exercise on Cognition, Academic Achievement, and Psychosocial Function in Children: A Systematic Review of Randomized Control Trials." *Prev Chronic Dis* 10: E174.
58. Fitzgibbon, M. L., M. R. Stolley, L. A. Schiffer, C. L. Braunschweig, S. L. Gomez, L. Van Horn, & A. R. Dyer. 2011. "Hip-Hop to Health Jr. Obesity Prevention Effectiveness Trial: Postintervention Results." *Obesity (Silver Spring)* 19(5): 994-1003.
59. Fitzgibbon, M. L., M. R. Stolley, L. Schiffer, L. Van Horn, K. Kaufer-Christoffel, A. Dyer. 2016. "Hip-Hop to Health Jr. for Latino Preschool Children." *Obesity (Silver Spring)* 14(9): 1616-25.
60. Buscemi, J., A. Odoms-Young, M. L. Stolley, L. Blumstein, L. Schiffer, M. L. Berbaum, J. McCaffrey, A. M. Montoya, C. Braunschweig, & M. L. Fitzgibbon. 2014. "Adaptation and Dissemination of an Evidence-Based Obesity Prevention Intervention: Design of a Comparative Effectiveness Trial." *Contemp Clin Trials* 38(2): 355-60.
61. Melnyk, B. M., D. Jacobson, S. Kelly, J. O'Haver, L. Small, & M. Z. Mays. 2009. "Improving the Mental Health, Healthy Lifestyle Choices, and Physical Health of Hispanic Adolescents: A Randomized Controlled Pilot Study." *J Sch Health* 79(12): 575-84.

62. Sallis, J. F., T. L. McKenzie, B. Kolody, M. Lewis, S. Marshall, & P. Rosengard. 1999. "Effects of Health-Related Physical Education on Academic Achievement: Project SPARK." *Res Q Exerc Sport* 70(2): 127-34.
63. Goh, T. L., J. Hannon, C. Webster, L. Podlog, & M. Newton. 2016. "Effects of a TAKE 10! Classroom-Based Physical Activity Intervention on Third- to Fifth-Grade Children's On-Task Behavior." *J Phys Act Health* 13(7): 712-18.
64. Kibbe, D. L., J. Hackett, M. Hurley, A. McFarland, K. G. Schubert, A. Schultz, & S. Harris. 2011. "Ten Years of TAKE 10!((R)): Integrating Physical Activity with Academic Concepts in Elementary School Classrooms." *Prev Med* 52(Suppl 1): S43-50.
65. Mahar, M. T. 2011. "Impact of Short Bouts of Physical Activity on Attention-to-Task in Elementary School Children." *Prev Med* 52(Suppl 1): S60-64.
66. Donnelly, J. E., J. L. Greene, & C. A. Gibson et al. "Physical Activity and Academic Achievement Across the Curriculum (A + PAAC): Rationale and Design of a 3-Year, Cluster-Randomized Trial." *BMC Public Health* 13: 307.
67. Donnelly, J. E., & K. Lambourne. 2011. "Classroom-Based Physical Activity, Cognition, and Academic Achievement." *Prev Med* 52(Suppl 1): S36-42.
68. Hillman, C. H., M. B. Pontifex, D. M. Castelli, N. A. Khan, L. B. Raine, M. R. Scudder, E. S. Drollette, R. D. Moore, C. T. Wu, & K. Kamijo. 2014. "Effects of the FITKids Randomized Controlled Trial on Executive Control and Brain Function." *Pediatrics* 134(4): e1063-71.
69. Tsai, P. Y., W. Boonpleng, B. J. McElmurry, C. G. Park, & L. McCreary. 2009. "Lessons Learned in Using TAKE 10! with Hispanic Children." *J Sch Nurs* 25(2): 163-72.
70. Hollar, D., S. E. Messiah, G. Lopez-Mitnik, T. L. Hollar, M. Almon, & A. S. Agatston. 2010. "Effect of a Two-Year Obesity Prevention Intervention on Percentile Changes in Body Mass Index and Academic Performance in Low-Income Elementary School Children." *Am J Public Health* 100(4): 646-53.
71. Rotter, M., C. R. Nigg, G. A. Renda, & R. Novotny. 2016. "Acculturation Is Not Related to Physical Activity Stage of Change for Children in Hawai'i." *Hawaii J Med Public Health* 75(2): 35-41.
72. Liu, D., & C. K. Alameda. 2011. "Social Determinants of Health for Native Hawaiian Children and Adolescents." *Hawaii Med J* 70(11 Suppl 2): 9-14.
73. Pateman, B., L. H. Irvin, L. Shoji, & K. Serna. 2004. "Building School Health Programs Through Public Health Initiatives: The First Three Years of the Healthy Hawaii Initiative Partnership for School Health." *Prev Chronic Dis* 1(1).
74. Teranishi, K., D. K. Hayes, L. K. Iwaishi, & L. J. Fuddy. 2001. "Poorer General Health Status in Children is Associated with being Overweight or Obese in Hawai'i: Findings from the 2007 National Survey of Children's Health." *Hawaii Med J* 70(7 suppl 1): 16-20.
75. Wilken, L. R., R. Novotny, M. K. Fialkowski, C. J. Boushey, C. Nigg, Y. Paulino, R. Leon Guerrero, A. Bersamin, D. Vargo, J. Kim, & J. Deenik. 2013. "Children's Healthy Living (CHL) Program for Remote Underserved Minority Populations in the Pacific Region: Rationale and Design of a Community Randomized Trial to Prevent Early Childhood Obesity." *BMC Public Health* 13: 944.
76. Ness, M., D. T. Barradas, J. Irving, & S. E. Manning. 2012. "Correlates of Overweight and Obesity Among American Indian/Alaska Native and Non-Hispanic White Children and Adolescents: National Survey of Children's Health, 2007." *Matern Child Health J* 16(0 2): 268-77.
77. Obama, M. 2012. "Let's Move! Raising a Healthier Generation of Kids." *Child Obes* 8(1): 1.
78. Berger-Jenkins, E., J. Rausch, & E. Okah et al. 2014. "Evaluation of a Coordinated School-Based Obesity Prevention Program in a Hispanic Community: Choosing Healthy and Active Lifestyles for Kids/Healthy Schools Healthy Families." *American Journal of Health Education* 45(5): 261-70.
79. Sacheck, J., V. Chomitz, K. Chui, C. Wright, N. Schultz, & C. Economos. 2015. *Active Bodies, Active Minds: A Case Study on Physical Activity and Academic Success in Lawrence, Massachusetts*. Boston: Boston Foundation.
80. National Center for Environmental Health. 2016. "Most Recent Asthma Data." Centers for Disease Control and Prevention. Accessed November 10, 2016. http://www.cdc.gov/asthma/most_recent_data.htm.
81. Cicutto, L., M. Gleason, & S. J. Szeffler. 2014. "Establishing School-Centered Asthma Programs." *Journal of Allergy and Clinical Immunology* 134(6): 1223-30, quiz 1231.
82. Asthma-Related Missed School Days Among Children Aged 5-17 Years. AsthmaStats 2015; https://www.cdc.gov/asthma/asthma_stats/missing_days.htm
83. Basch, C. E. 2011. "Asthma and the Achievement Gap Among Urban Minority Youth." *J Sch Health* 81(10): 606-13.
84. Evans, W. D., L. Patchen, T. E. Pease, J. P. Nestel-Patt, & J. Wallace. 2012. "Teen Pregnancy Prevention Among At-Risk Urban Youth: Improving Parent-Child Connectedness." In *Health Disparities Among Under-Served Populations: Implications for Research, Policy and Praxis*, edited by S. R. Notaro, vol 9, 177-206.
85. Splett, P. L., C. D. Erickson, S. B. Belseth, & C. Jensen. 2006. "Evaluation and Sustainability of the Healthy Learners Asthma Initiative." *J Sch Health* 76(6): 276-82.
86. Levy, M., B. Heffner, T. Stewart, & G. Beeman. 2006. "The Efficacy of Asthma Case Management in an Urban School District in Reducing School Absences and Hospitalizations for Asthma." *J Sch Health* 76(6): 320-24.
87. Bartholomew, L. K., M. Sockrider, & S. L. Abramson et al. 2006. "Partners in School Asthma Management: Evaluation of a Self-Management Program for Children with Asthma." *J Sch Health* 76(6): 283-90.
88. DePue, J. D., E. L. McQuaid, D. Koinis-Mitchell, C. Camillo, A. Alario, & R. B. Klein. 2007. "Providence School Asthma Partnership: School-Based Asthma Program for Inner-City Families." *J Asthma* 44(6): 449-53.
89. Liao, O., T. Morphew, S. Amaro, & S. P. Galant. 2006. "The Breathmobile: A Novel Comprehensive School-Based Mobile Asthma Care Clinic for Urban Underprivileged Children." *J Sch Health* 76(6): 313-19.
90. Webber, M. P., K. E. Carpinello, T. Oruwariye, Y. Lo, W. B. Burton, & D. K. Appel. 2003. "Burden of Asthma in Inner-City Elementary Schoolchildren: Do School-Based Health Centers Make a Difference?" *Archives of Pediatrics & Adolescent Medicine* 157(2): 125-29.
91. Gerald, L. B., D. Redden, & A. R. Wittich et al. 2006. "Outcomes for a Comprehensive School-Based Asthma Management Program." *J Sch Health* 76(6): 291-96.
92. Clark, N. M., S. Shah, J. A. Dodge, L. J. Thomas, R. R. Andridge, & R. J. Little. 2010. "An Evaluation of Asthma Interventions for Preteen Students." *J Sch Health* 80(2): 80-87.
93. Clark, N. M., R. Brown, C. L. Joseph, E. W. Anderson, M. Liu, & M. A. Valerio. 2004. "Effects of a Comprehensive School-Based Asthma Program on Symptoms, Parent Management, Grades, and Absenteeism." *Chest* 125(5): 1674-79.

94. Evans, D., N. M. Clark, & C. H. Feldman et al. 1987. "A School Health Education Program for Children with Asthma Aged 8-11 Years." *Health Educ Q* 14(3): 267-79.
95. Keehner Engelke, M., M. Guttu, M. B. Warren, & M. Swanson. 2008. "School Nurse Case Management for Children with Chronic Illness: Health, Academic, and Quality of Life Outcomes." *J Sch Nurs* 24(4): 205-14.
96. Keehner Engelke, M., M. Swanson, & M. Guttu. 2014. "Process and Outcomes of School Nurse Case Management for Students with Asthma." *J Sch Nurs* 30(3): 196-205.
97. Moricca, M. L., M. A. Grasska, M. BMarthaler, T. Morphey, P. C. Weismuller, & S. P. Galant. 2013. "School Asthma Screening and Case Management: Attendance and Learning Outcomes." *J Sch Nurs* 29(2): 104-12.
98. McWhirter, J., D. McCann, H. Coleman, M. Calvert, & J. Warner. 2008. "Can Schools Promote the Health of Children with Asthma?" *Health Educ Res* 23(6): 917-30.
99. Mosnaim, G. S., H. Li, & M. Damitz et al. 2011. "Evaluation of the Fight Asthma Now (FAN) Program to Improve Asthma Knowledge in Urban Youth and Teenagers." *Ann Allergy Asthma & Immunol* 107(4): 310-16.
100. Gerald, L. B., L. A. McClure, & J. M. Mangan et al. 2009. "Increasing Adherence to Inhaled Steroid Therapy Among Schoolchildren: Randomized, Controlled Trial of School-Based Supervised Asthma Therapy." *Pediatrics* 123(2): 466-74.
101. Cicutto, L., T. To, & S. Murphy. 2013. "A Randomized Controlled Trial of a Public Health Nurse-Delivered Asthma Program to Elementary Schools." *J Sch Health* 83(12): 876-84.
102. Knopf, J. A., R. K. Finnie, & Y. Peng et al. 2016. "School-Based Health Centers to Advance Health Equity: A Community Guide Systematic Review." *American Journal of Preventive Medicine* 51(1): 114-26.
103. Strolin-Goltzman, J., A. Sisselman, K. Melekis, & C. Auerbach. 2014. "Understanding the Relationship Between School-Based Health Center Use, School Connection, and Academic Performance." *Health Soc Work* 39(2): 83-91.
104. Geierstanger, S. P., G. Amaral, M. Mansour, & S. R. Walters. 2004. "School-Based Health Centers and Academic Performance: Research, Challenges, and Recommendations." *J Sch Health* 74(9): 347-52.
105. Foy, J. E., & K. Hahn. 2009. "School-Based Health Centers: A Four Year Experience, with a Focus on Reducing Student Exclusion Rates." *Osteopath Med Prim Care* 3:3.
106. Sanford, C. C. 2001. "Delivering Health Care to Children on Their Turf: An Elementary School-Based Wellness Center." *J Pediatr Health Care* 15(3): 132-37.
107. Lurie, N., E. J. Bauer, & C. Brady. 2001. "Asthma Outcomes at an Inner-City School-Based Health Center." *J Sch Health* 71(1): 9-16.
108. Simon, A. E., P. N. Pastor, C. A. Reuben, L. N. Huang, & I. D. Goldstrom. 2015. "Use of Mental Health Services by Children Ages Six to 11 with Emotional or Behavioral Difficulties." *Psychiatr Serv* 66(9): 930-37.
109. Barbarin, O. A., V. M. McBride, P. Tolan, & S. Graham. 2016. "Development of Boys and Young Men of Color: Implications of Developmental Science for My Brother's Keeper Initiative." *Social Policy Report* 29(3): 2-30.
110. Brindis, C. D., J. Klein, J. Schlitt, J. Santelli, L. Juszczak, & R. J. Nystrom. 2003. "School-Based Health Centers: Accessibility and Accountability." *J Adolesc Health* 32(6 Suppl): 98-107.
111. Cummings, J. R., N. A. Ponce, & V. M. Mays. 2010. "Comparing Racial/Ethnic Differences in Mental Health Service Use Among High-Need Subpopulations Across Clinical and School-Based Settings." *J Adolesc Health* 46(6): 603-606.
112. Zins, J. E., M. R. Bloodworth, R. P. Weissberg, & H. J. Walberg. 2004. "The Scientific Base Linking Social and Emotional Learning to School Success." In: *Building Academic Success on Social and Emotional Learning: What Does the Research Say?*, edited by J. E. Zins, R. P. Weissberg, M. C. Wang, & H. J. Walberg, 3-22. New York: Teachers College Press.
113. American Institutes for Research. 2016. *When Districts Support and Integrate Social and Emotional Learning (SEL): Findings from an Ongoing Evaluation of Districtwide Implementation*. Education Policy Center. <http://www.air.org/sites/default/files/downloads/report/When-Districts-Support-and-Integrate-SEL-October-2016.pdf>. 2016.
114. Paulus, F. W., S. Ohmann, & C. Popow. 2016. "Practitioner Review: School-Based Interventions In Child Mental Health." *J Child Psychol & Psychiatr* 57(12): 1337-59.
115. Paulus, F. W., S. Ohmann, & C. Popow. 2016. "Practitioner Review: School-Based Interventions In Child Mental Health." *J Child Psychol & Psychiatr* 57(12): 1337-59.
116. Rones, M., & K. Hoagwood. 2000. "School-Based Mental Health Services: A Research Review." *Clin Child and Fam Psychol Rev* 3(4): 223-41.
117. Hoagwood, K. E., S. S. Olin, B. D. Kerker, T. R. Kratochwill, M. Crowe, & N. Saka. 2007. "Empirically Based School Interventions Targeted at Academic and Mental Health Functioning." *J Emot and Behav Disord* 15(2): 66-92.
118. Calear, A. L., & H. Christensen. 2010. "Systematic Review of School-Based Prevention and Early Intervention Programs for Depression." *J Adolesc* 33(3): 429-38.
119. Neil, A. L., & H. Christensen. 2009. "Efficacy and Effectiveness of School-Based Prevention and Early Intervention Programs for Anxiety." *Clin Psychol Rev* 29(3): 208-15.
120. Mytton, J., C. DiGiuseppi, D. Gough, R. Taylor, & S. Logan. 2006. "School-Based Secondary Prevention Programmes for Preventing Violence." *Cochrane Database Syst Rev* 19(3): CD004606.
121. Daly, B. P., M. A. Sander, E. G. Nicholls, A. Medhanie, E. Vanden Berk, & J. Johnson. 2014. "Three-Year Longitudinal Study of School Behavior and Academic Outcomes: Results from a Comprehensive Expanded School Mental Health Program." *Advances in School Mental Health Promotion* 7(1): 24-41.
122. Strolin-Goltzman, J. 2010. "The Relationship Between School-Based Health Centers and the Learning Environment." *J Sch Health* 80(3): 153-59.
123. Conduct Problems Prevention Research Group. 2011. "The Effects of the Fast Track Preventive Intervention on the Development of Conduct Disorder Across Childhood." *Child Dev* 82(1): 331-45.
124. Bierman, K. L., J. D. Coie, & K. A. Dodge et al. 2004. "The Effects of the Fast Track Program on Serious Problem Outcomes at the End of Elementary School." *J Clin Child Adolesc Psychol* 33(4): 650-61.
125. Conduct Problems Prevention Research Group. 2007. "Fast Track Randomized Controlled Trial to Prevent Externalizing Psychiatric Disorders: Findings from Grades 3 to 9." *J Am Acad Child Adolesc Psychiatry* 46(10): 1250-62.
126. Bloomquist, M. L., G. J. August, & R. Ostrander. 1991. "Effects of a School-Based Cognitive-Behavioral Intervention for ADHD Children." *J Abnorm Child Psychol* 19(5): 591-605.

127. Stein, M. T., & J. M. Perrin. 2003. "Diagnosis and Treatment of ADHD in School-Age Children in Primary Care Settings." *Pediatr Rev* 24(3): 92-98.
128. Stein, B. D., L. H. Jaycox, & S. H. Kataoka et al. 2003. "A Mental Health Intervention for Schoolchildren Exposed to Violence: A Randomized Controlled Trial." *JAMA* 290(5): 603-11.
129. King, C. A., & D. S. Kirschenbaum. 1990. "An Experimental Evaluation of a School-Based Program for Children at Risk: Wisconsin Early Intervention." *J Community Psychol* 18(2): 167-77.
130. Lochman, J. E., J. D. Coie, M. K. Underwood, & R. Terry. 1993. "Effectiveness of a Social Relations Intervention Program for Aggressive and Nonaggressive, Rejected Children." *J Consult Clin Psychol* 61(6): 1053-58.
131. Guo, J.J., T. J. Wade, & K. N. Keller. 2008. "Impact of School-Based Health Centers on Students with Mental Health Problems." *Public Health Rep* 123(6): 768-80.
132. Iachini, A. L., E. L. Brown, A. Ball, J. E. Gibson, & S. E. Lize. 2015. "School Mental Health Early Interventions and Academic Outcomes for At-Risk High School Students: A Meta-Analysis." *Adv Sch Ment Health Promot* 8(3): 156-75.
133. Murray, N. G., B. J. Low, C. Hollis, A. W. Cross, & S. M. Davis. 2007. "Coordinated School Health Programs and Academic Achievement: A Systematic Review of the Literature." *J Sch Health* 77(9): 589-600.
134. Centers for Disease Control and Prevention. 2016. "QuickStats: Death Rates for Motor Vehicle Traffic Injury, Suicide, and Homicide Among Children and Adolescents Aged 10-14 Years—United States, 1999-2014." *Morbidity and Mortality Weekly Report*. http://www.cdc.gov/mmwr/volumes/65/wr/mm6543a8.htm?s_cid=mm6543a8_w.
135. Horner, S. D. 2004. "Effect of Education on School-Age Children's and Parents' Asthma Management." *J Spec Pediatr Nurs* 9(3): 95-102.
136. Krafft, C. E., N. F. Schwarz, L. Chi, A. L. Weinberger, D. J. Schaeffer, J. E. Pierce, A. L. Rodrigue, N. E. Yanasak, P. H. Miller, P. D. Tomporowski, C. L. Davis, & J. E. McDowell. 2014. "An 8- Month Randomized Controlled Exercise Trial Alters Brain Activation During Cognitive Tasks in Overweight Children." *Obesity (Silver Spring)* 22(1): 232-42.
137. Bailey, E. J., C. J. Cates, S. G. Kruske, P. S. Morris, N. Brown, & A. B. Chang. 2009. "Culture-Specific Programs for Children and Adults from Minority Groups Who Have Asthma." *Cochrane Database Syst Rev* 2: CD006580.
138. Kataoka, S. H., B. D. Stein, & L. H. Jaycox et al. 2003. "A School-Based Mental Health Program for Traumatized Latino Immigrant Children." *J Am Acad Child Adolesc Psychiatry* 42(3): 311-18.
139. Langley, A. K., A. Gonzalez, C. A. Sugar, D. Solis, & L. Jaycox. 2015. "Bounce Back: Effectiveness of an Elementary School-Based Intervention for Multicultural Children Exposed to Traumatic Events." *J Consult Clinical Psychol* 83(5): 853-65.
140. Attendance Works. 2014. Attendance in the Early Grade: Why it Matters for Reading. <http://www.attendanceworks.org/wordpress/wp-content/uploads/2014/03/Attendance-in-the-Early-Grades.pdf>.
141. Becker, K. D., N. E. Evangelista, S. H. Stepha, & B. F. Chorpita. 2013. "A Review of Educational Outcomes in the Children's Mental Health Treatment Literature." *Adv Sch Ment Health Promot* 7(1): 5-23.
142. Hollenbach, J. P., & M. M. Cloutier. 2014. "Implementing School Asthma Programs: Lessons Learned and Recommendations." *J Allergy Clin Immunol* 134(6): 1245-49.
143. Atkins, M. S., K. Hoagwood, K. Kutash, & E. Seidman. 2010. "Toward the Integration of Education and Mental Health in Schools." *Administration and Policy in Mental Health and Mental Health Services Research* 37(1): 40-47.
144. Robinson Jr., L., D. P. Calmes, & M. Bazargan. 2008. "The Impact of Literacy Enhancement on Asthma-Related Outcomes Among Underserved Children." *J Natl Med Assoc* 100(8): 892-96.
145. Flay, B. R., C. G. Allred, & N. Ordway. 2001. "Effects of the Positive Action Program on Achievement and Discipline: Two-Matched-Control Comparisons." *Prevention Science* 2(2): 71-89.
146. Caballero, B., T. Clay, S. M. Davis, B. Ethelbah, B. H. Rock, T. Lohman, J. Norman, M. Story, E. J. Stone, L. Stephenson, & J. Stevens. 2003. "Pathways: A School-Based, Randomized Controlled Trial for the Prevention of Obesity in American Indian Schoolchildren." *Am J Clin Nutr* 78(5): 1030-38.
147. Himes JH, Ring K, Gittelsohn J, Cunningham-Sabo L, Weber J, Thompson J, Harnack L, Suchindran C. Impact of the Pathways intervention on dietary intakes of American Indian schoolchildren. *Prev Med*. 2003 Dec;37(6 Pt 2):S55-61.
148. Trust for America's Health and Robert Wood Johnson Foundation. 2014. *The State of Obesity: Better Policies for a Healthier America*. Obesity Prevention in Black Communities. <http://stateofobesity.org/disparities/blacks/>
149. Soleimanpour, S. & Geierstanger, S.P. Documenting the Link Between School-Based Health Centers and Academic Success. 2014. San Francisco: Philip R. Lee Institute for Health Policy Studies. Available at: <http://healthpolicy.ucsf.edu/sites/healthpolicy.ucsf.edu/files/documents/SBHCs-Academic-Success-CA-Alliance-2014.pdf>
150. Ollove, M. 2015. "With Federal Policy Changes, More Money for School-Based Health Services." *Stateline*, January 22. <http://www.pewtrusts.org/en/research-and-analysis/blogs/stateline/2015/1/22/with-federal-policy-change-more-money-for-school-based-health-services>.
151. Silberberg, M., & J. C. Cantor. 2008. "Making the Case for School-Based Health: Where Do We Stand?" *J Health Polit Policy Law* 33(1): 3-37.
152. Kena, G., W. Hussar, J. McFarland, C. de Brey, L. Musu-Gillette, X. Wang, J. Zhang, A. Rathbun, S. Wilkinson-Flicker, M. Diliberti, A. Barmer, F. Bullock Mann, & E. Dunlop Velez. 2016. *The Condition of Education 2016*. Washington, DC: U.S. Department of Education, National Center for Education Statistics. Available at <http://nces.ed.gov/pubsearch>.
153. Barnett, W. S., D. J. Epstein, M. E. Carolan, J. Fitzgerald, D. J. Ackerman, & A. H. Friedman. 2010. *The State of Preschool 2010*. New Brunswick, NJ: National Institute for Early Education Research Supported by The Pew Charitable Trusts.
154. Bassok, J. M., D. Fitzpatrick, E. Greenberg, & S. Loeb. 2016. "Within- and Between-Sector Quality Differences in Early Childhood Education and Care." *Child Dev* 87(5): 1627-45.
155. Schweinhart, L. J. 2013. "Long-Term Follow-Up of a Preschool Experiment." *Journal of Experimental Criminology* 9(4): 389-409.
156. Ray, K. N., & A. Mehrotra. 2016. "Trends in Access to Primary Care for Children in the United States, 2002-2013." *JAMA Pediatr* 170(10): 1023-25.
157. Langellier, B. A., J. Chen, A. Vargas-Bustamante, M. Inkelas, & A. N. Ortega. 2016. "Understanding Health-Care Access and Utilization Disparities Among Latino Children in the United States." *J Child Health Care* 20(2): 133-44.
158. Berdahl, T. A., B. S. Friedman, M. C. McCormick, & L. Simpson. "Annual Report on Health Care for Children and Youth in the United States: Trends in Racial/Ethnic, Income, and Insurance Disparities over Time, 2002-2009." *Acad Pediatr* 13(3): 191-203.

ABOUT THE AUTHORS



Ninez A. Ponce, MPP, PhD

I am an immigrant from the Philippines, raised by a public school teacher, counselor, and administrator of one of the first multicultural K-12 education programs in the country. I was an advocate for many years serving the constituents of the Berkeley Free Clinic, Vacaville Prison Project, and the Asian and Pacific Islander American Health Forum. Over the last decade, I helped establish and served as founding chair of the board of New Heights Charter School, an elementary school in South Los Angeles dedicated to cultivating social and emotional development, health and wellness, and the arts. The school serves over 90% Black and Latino students, most receiving free and reduced school lunch. I have also served on the board of the California Pan Ethnic Health Network, a multicultural statewide advocacy program that has had a solid 20-year track record of fighting for policies that improve the health of communities of color. In my “day job”, my research centers on understanding and eliminating social penalties that abrade health and fuel racial/ethnic disparities in health and economic wellbeing. I am an academic, trained in applied health economics, health policy and health services research. Much of my work is in partnership with scholars in other disciplines and change agents from community advocacy coalitions and community health center organizations. Projects such as RISE encourage thinking in a way that crosses disciplines and facilitate discovery of efforts that address race/ethnicity and gender. I am still a learner in the intersection of the health and education space, so I thank RISE for the opportunity to delve into this important, (and as we determined), underdeveloped intersection.



AJ Scheitler, EdD

I am the daughter of public school teachers, and have been raised to believe in the ability of a good education to improve one’s life outcomes. I earned a doctorate in Higher Education Administration, and a significant portion of my professional career has also been involved in education policy and working to improve education access and attainment for all students. Upon joining UCLA my career started to involve work in health policy and issues. I am affiliated with both the Center for Global and Immigrant Health and the Center for Health Policy Research, where I have been involved with projects that seek to expose and address health disparities, which are often seen in racial minority groups and are disproportionately prevalent among communities of color. Given the convergence of my work, I approached this project with the expectation that we would identify significant programs targeting improved health outcomes to specifically influence academic performance.



Riti Shimkhada, MPH, PhD

I am the daughter of immigrants from Nepal and being of a minority group in the U.S. contributes to my particular interest in communities of color. I have lived in Los Angeles for about 15 years. I have been involved in numerous projects on health disparities by race/ethnicity and the need for disaggregation of data by race/ethnicity, particularly for Asian American, Native Hawaiian, Pacific Islander (AANHPI), and American Indian and Alaska Native (AI/AN) groups. On a personal note, I am also actively involved in various school-based activities at my local elementary school ranging from participating in health education sessions during the science fair to working on transportation safety, including safe walking to school. I believe these aspects of my background have led me to be particularly interested in learning more on the literature regarding the effectiveness of school based physical activity and nutrition programs on improving health and education outcomes. After having done work in the area of health disparities, I came into this project with the expectation there would be a large body of evidence on disparities and a smaller body of evidence on interventions.



Michelle Ko, MD, PhD

I am the daughter of immigrants from Taiwan, and they encouraged activism throughout my childhood, as a means to counter their own experiences of poverty, martial law, and political oppression. I received my medical degree from the UCLA/Drew Medical Education Program, which trains medical students in with a commitment to underserved communities. As part of this program, I completed my clinical training in South Los Angeles, working in a predominantly African American and Latino community that has suffered from some of the most socially, economically, and health disadvantaged communities in Los Angeles. I became an academic to better understand and ultimately shed light on the intersection of social inequalities and our healthcare system. My training was formally in health services research, but built around sociology, policy, and economics. I have spent the better part of my research career exploring issues of diversity, racial and ethnic disparities in access to healthcare, and the influences of residential segregation and income inequality. I very much appreciate the opportunity from RISE to expand my learning into the intersections of health and education policy. My interest in education stems partly from my work in medical education, my community work as an advocate and mentor to first generation college students, and more recently, as an organizer for families of English-language learners in my daughter's elementary school. I came into this project with the hope that there would be greater evidence of health and education collaboration that was specifically targeted to boys of color.

RISE is a joint initiative co-led by Equal Measure and
Penn GSE Center for the Study of Race and Equity in Education.



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