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Abstract

This article summarizes the results from a 2013 online survey with 408 principals and assistant principals in New York City public elementary and middle schools. The survey assessed three primary areas: health issues in the school, health issues perceived as barriers to learning for affected students, and resources needed to address these barriers. Eighteen of the 22 health conditions listed in the survey were considered a moderate or serious issue within their schools by at least 10% of respondents. All 22 of the health issues were perceived as a barrier to learning by between 12% and 87% of the respondents. Representatives from schools that serve a higher percentage of low-income students reported significantly higher levels of concern about the extent of health issues and their impact on learning. Respondents most often said they need linkages with organizations that can provide additional services and resources at the school, especially for mental health.

Keywords

educational administration, leadership and policy, education, disparities, attendance, academics, schools

Introduction

While it might seem intuitive that a child who is free of health problems will be more able to perform optimally in school, research has only recently begun to elucidate the dimensions of this relationship, particularly for low-income children who experience a greater number of health problems relative to more affluent children.

It is clear from the 2013 New York City (NYC) Independent Budget Office report on the NYC Public Schools that income-related academic achievement gaps are prominent. Academic achievement, especially since the passage of the No Child Left Behind legislation of 2001, is generally assessed by scores on standardized reading (language arts) and mathematics tests. In many instances, these test scores have also become the standard by which teachers, schools, and state education systems are evaluated (No Child Left Behind, 2004; U.S. Department of Education, 2002). The steep decline in the percentage of elementary school students meeting or exceeding proficiency levels for reading and math based on student poverty status is shown in Figure 1.

These data underscore the importance of placing additional focus on children in poverty and schools serving a higher proportion of low-income students when examining health conditions that may interfere with optimal school performance (“health barriers to learning”). Despite the fact that children from low-income families and neighborhoods are more likely to experience health disparities and academic challenges, there has not been sufficient study of their relationship (Fiscella & Kitzman, 2009).

When medical, mental health, and psychosocial conditions are effectively prevented, identified, managed, and/or treated, children have the greatest likelihood of fulfilling their potential in school and life. Conversely, unmanaged medical and psychosocial issues are more likely to interfere with optimal brain growth (especially in infancy and early childhood), cognitive development, and academic achievement (Shonkoff et al., 2012). Compared with more affluent children, children in low-income families and neighborhoods experience higher rates of acute and chronic medical conditions and of learning and behavior problems. They also frequently face barriers to health care access that are associated with worse health outcomes (Larson & Halfon, 2010). This suggests that these same health issues may become health barriers to learning and that schools with the largest proportion of low-income children may have an increased burden of student health issues.

Although the connections among psychosocial and neighborhood-level stressors, chronic illness, and academic performance are complex, there is a growing body of evidence supporting the link between health status and

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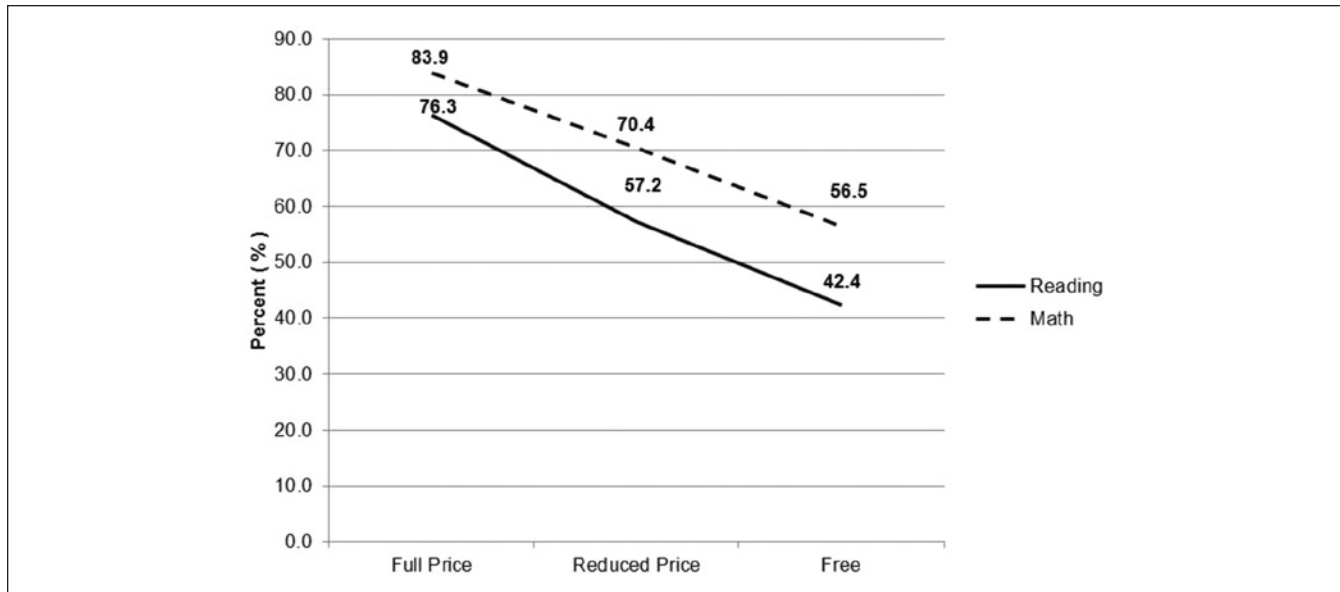


Figure 1. Academic proficiency and FRPL eligibility, NYC public schools, 2011-2012 school year at Grade 3.

Source: Independent Budget Office.

Note: FRPL = free or reduced price for lunch; NYC = New York City.

educational outcomes. In a comprehensive literature review, Grant and Brito (2010) discussed the evidence linking chronic health conditions with academic performance. They concluded that effective treatment of chronic illness improves a child's opportunities to learn through better health status and reduced absenteeism. Moreover, the review offers evidence that effective asthma management (especially that which reduces nocturnal symptoms that disrupt the child's sleep) positively influences readiness to learn in school the next day. A direct relationship to learning was also found for developmental and psychiatric disorders. There was not, however, sufficient evidence to show that chronic disease management improves academic performance, which is also influenced by multiple factors. Reviewing similar issues, a 2012 report from The Healthy Schools Campaign, Trust for America's Children described the link between health and learning in terms of healthy children experiencing better school attendance and readiness to learn. The authors recommended school-based initiatives to promote child health and wellness.

Several other reports have begun to elucidate the existence of these health issues that interfere with educational success and potential solutions to address them. Basch (2010) suggested a list of priority health issues in the educational context: vision problems, asthma, teen pregnancy, aggressive and violent behavior, inattention and hyperactivity, lack of opportunities for physical activity, and whether students have had breakfast. These issues were suggested because of their higher prevalence among low-income children, evidence of worse health outcomes in minority and low-income populations, evidence of impact on learning, and amenability to school-based interventions. Basch concluded his report with the

recommendation that school officials at all levels increase their focus on student health.

Study Location and Purpose

New York City, which is home to more than eight million people, has the largest public school system in the United States. More than one million children in NYC were enrolled in non-charter public elementary, middle, and high schools as of December 31, 2012 (NYC Department of Education, 2013b). As in most large urban school systems, a high proportion of NYC Public School students are from low-income families and are members of minority racial-ethnic groups, as reflected in the differences between the public school and citywide child population demographics (NYC Independent Budget Office, 2013).

With the goal of determining the degree to which school leaders in NYC public schools are focused on and perceive their students are affected by health barriers to learning, a not-for-profit health organization (Children's Health Fund [CHF])¹ partnered with an education union (the Council of Supervisors and Administrators [CSA])² to develop a survey targeted at school officials. The purpose of this survey was to identify (a) the type and extent of health issues perceived to be a problem in schools, (b) the perceived impact of these problems on students' ability to learn, and (c) the resources needed to address these health problems. In addition to identifying these issues, the study was also designed to examine whether schools that serve a higher proportion of children from low-income families report a greater number or impact of health barriers to learning.

Methods

The survey format and content were developed by the authors with input from CSA members and school leadership representing schools in Manhattan, Brooklyn, the Bronx, and Queens. The final survey (available on request) included four sets of items.

The first set of items included a drop-down list of 22 health, mental health, and developmental conditions selected based on an extensive literature review and input from CSA members, with open-ended options to identify conditions not listed. Respondents were asked to rate the degree to which each issue was a problem in their school, using a 4-point Likert-type scale from *not a problem* to *serious problem* with the opportunity to indicate “don’t know if this is a problem.” For mental health problems, a distinction was made between externalizing symptoms (disruptive behavior and attention deficits) and internalizing symptoms (depression, anxiety, and stress).

The second item set included the same conditions but asked respondents to rate the degree to which the issue posed a barrier to learning for affected children. This question set also used a 4-point Likert-type scale, ranging from *no impact on learning* to *major impact on learning*, with an option for “not applicable.”

The third set of items asked respondents to choose from 13 potential resources from a drop-down list (with open-ended options) that could help them to better address student health issues in school. These resources ranged in type from additional support with managing particular conditions, to more assistance with obtaining information, to more access to school-based health professionals. Respondents were asked to review the list and then to select the top five resources that they thought would be the most helpful to them.

The fourth set of items elicited school information including the percentage of children identified as U.S. Department of Agriculture (USDA) eligible for free or reduced price for lunch (FRPL), community school district, school population (elementary, middle, or high school), how many days per week a school nurse was on-site; and availability of mental health services at the school. In addition, respondents had the option of providing their school’s District Borough Number (DBN), a unique school identifier used by the NYC Department of Education.

In mid-May, 2013, CSA sent out an email (developed in consultation with the CHF team) inviting one administrative representative (principal or assistant principal, as applicable) from each of the 1,700 public elementary, middle, and high schools in NYC to participate in this survey. The survey took approximately 10 minutes to complete and was filled out online via Survey Monkey. CSA sent multiple email reminders to each principal and assistant principal at intervals shortly before and during the 3-week period when the survey was online and available for completion (May 20 to June 7, 2013).

As is typical in education studies, the students’ assessed eligibility per USDA guidelines for free or reduced price school breakfast and lunch was used as a proxy for poverty status (FRPL). USDA eligibility for “free” lunch is assigned for children with family incomes at or below 130% of the federal poverty level (FPL); USDA “reduced price” for children with near-poverty family income (131%-185% FPL); and USDA “full price” for children with household income >185% FPL (U.S. Department of Agriculture Food and Nutrition Program, n.d.).

There were no incentives for participating or sanctions for not participating in the survey. This study was approved by the Western Institutional Review Board (IRB).

Data Analysis

A total of 821 respondents began the survey. Of these, 626 completed the survey for a response rate of 36.8% and adequate power for analyses conducted (Survey Monkey Help Center, n.d.). Respondents were relatively evenly divided between principals (52%) and assistant principals (48%) representing 340 elementary schools, 121 middle schools, and 161 high schools in the NYC public school system. Data were unavailable for 4 of the schools.

This article analyzes responses from school leadership representing elementary and middle schools. Analyses were restricted to these schools because they represented the majority (74.1%) of the sample, and health issues are more homogeneous in elementary and middle schools compared with high schools, where there is typically an additional emphasis on family planning and reproductive health (Fothergill & Fiejoo, 2000). Comparisons were made between respondents in higher versus lower poverty schools, to focus on children who are likely to experience both academic challenges and health disparities. These inclusion criteria resulted in a final analytic sample of 408 completed surveys, which excluded high schools and schools for which the percent of students receiving FRPL was unavailable.

Respondents were categorized as representing a higher or lower poverty school based on their FRPL percentage, with a cut point of 70%. This cut point was chosen because the mean for NYC schools citywide was 69%, with the analysis reflecting schools with FRPL greater than versus equal to or less than the citywide mean (NYC Department of Education, 2013a). Sensitivity analyses were conducted on the group of respondents with 70% or higher FRPL rates. There were no statistically significant differences among the three FRPL groups: 70% to 79%; 80% to 89%; and 90% and above. Citywide student data show that the majority of children represented in the FRPL percentage are identified as USDA free (family income at or below 130% FPL), supporting that this analytic method was sensitive to the representation of children in poverty in the schools (NYC Independent Budget Office, 2013). The dichotomous variable created was “higher poverty” (320 schools, 78% of the analytic sample) versus

Table 1. Health Problems and Health Barriers to Learning Within NYC Public Schools, as Indicated by Principals and Assistant Principals.

Health issue	% reporting issue as barrier to learning	% reporting issue as problem
Learning disability	87	75
Disruptive behaviors (e.g., hyperactivity, attention deficit disorders, oppositional behavior, etc.)	86	74
Depression, anxiety, or stress	63	39
Asthma	63	71
Vision problems	57	36
Fatigue/falling asleep in class	56	26
Poor diet (e.g., sugary drinks, unhealthy foods, etc.)	55	59
Hunger (e.g., coming to school without eating breakfast)	53	37
Bullying	48	32
Problems with getting health care (e.g., no insurance, no regular doctor, etc.)	45	38
Lack of exercise or physical activity	41	41
Contagious illnesses (e.g., flu, strep throat, stomach viruses, etc.)	40	32
Obesity or overweight students	36	42
Self-injurious behaviors (e.g., cutting, etc.)	28	13
Hearing problems	28	7
Substance abuse (e.g., drugs, alcohol, tobacco, etc.)	23	9
Diabetes	18	10
Non-food allergies	18	17
Food allergies	18	28
Eating disorders	18	8
Dental pain	17	11
Pregnancy	12	3

Note. NYC = New York City.

“lower poverty” (88 schools, 22% of the analytic sample). There were few low poverty schools in the analytic sample, with only 7% of school officials having reported less than 20% FRPL.

The analyses presented in this article focused on these survey items: (a) “Do you consider [health issue] to be a problem in your school?” (b) “For students that have [health issue], do you think this problem impacts their ability to learn?” and (c) “What kinds of resources do you need to address the health problems in your school?”

As is typical for analysis of Likert-type scale data, the two responses that endorsed the health issue as a moderate or serious problem in the school or barrier to learning were aggregated as a positive response (Boon & Boon, 2012). This dichotomous variable was used in the analyses.

Descriptive statistics were used to analyze responses to the survey questions of interest, and Pearson chi-square tests were used to determine significance based on higher/lower poverty school status. Comparative analyses were limited due to cell size of lower poverty schools. All analyses were completed using SAS V 9.3 statistical software.

Results

Analysis of the FRPL characteristics of the survey respondents revealed a response bias toward higher poverty schools,

with higher mean and median percentages of USDA free and reduced price eligible students in the survey sample compared with the NYC public schools ($M = 80\%$ in survey sample vs. 69% in NYC public schools; median = 86% vs. 74% ; NYC Department of Education, 2013a). The survey results over-represented higher poverty schools.

Health Issues and Health Barriers to Learning

Table 1 summarizes the rank order and percentages of respondents identifying each of the 22 health conditions included in the survey as a problem within the school and as a perceived barrier to learning. For the 408 respondents in the final analytic sample, 18 of the 22 health conditions were considered a moderate or serious issue within their school by at least 10% of the respondents. All 22 were considered health barriers to learning by more than 10% of the respondents. The health conditions for which there was overlap in terms of highest frequencies of report as a problem in the school and as a barrier to learning were learning disability; disruptive behavior; asthma; poor diet; depression, anxiety, or stress; problems accessing health care; hunger; and vision problems.

Further analyses explored the relationship between the respondents' perceptions and the poverty level of the school population, with a probability value of $<.05$ indicating

Table 2. Health Barriers to Learning as Reported for Higher Compared With Lower Poverty Schools.

Health issue	Higher poverty group ≥70% FRPL (n = 320)		Lower poverty group <70% FRPL (n = 88)	
	%	n	%	n
Learning disabilities	88	265	81	62
Disruptive behaviors (e.g., hyperactivity, attention deficit disorders, oppositional behavior etc.)*	88	264	76	62
Asthma*	67	200	47	36
Depression/anxiety/stress	65	185	55	41
Fatigue/falling asleep in class*	62	180	35	25
Vision*	60	174	42	30
Poor diet (e.g., sugary drinks, unhealthy foods, etc.)*	60	174	38	29
Hunger*	59	167	29	21
Problems accessing care*	50	143	26	19
Bullying	50	143	39	30
Lack of exercise or physical activity*	44	129	28	21
Contagious illnesses (e.g., flu, strep throat, stomach viruses, etc.)	39	112	44	33
Obesity or overweight students	38	112	27	21
Hearing problems	31	84	20	14
Self-injurious behaviors (e.g., cutting, etc.)	30	79	24	17
Substance abuse (e.g., drugs, alcohol, tobacco, etc.)	24	62	20	14
Diabetes	20	55	11	8
Dental pain*	20	54	7	5
Eating disorders	20	52	10	7
Non-food allergies	19	52	15	11
Food allergies	18	52	16	12
Pregnancy	14	36	6	4

Note. FRPL = free or reduced price for lunch.

*Difference between <70% FRPL and ≥70% FRPL significant at the $p < .05$ level.

statistically significant differences. Significantly more respondents from higher poverty compared with lower poverty schools reported the following to be problems in their school: learning disabilities; disruptive behaviors; asthma; poor diet; obesity or overweight students; lack of exercise; hunger; problems accessing health care; depression, anxiety, or stress; fatigue (falling asleep in class); vision problems; and bullying. There were no significant differences based on school poverty status for contagious illnesses such as flu as a problem in the school. For the other conditions (diabetes, substance abuse, eating disorders, hearing problems, and pregnancy), the number of respondents indicating that these were or were not issues was too small for potential statistically significant differences to emerge.

Similarly, there were significant differences between respondents for higher compared with lower poverty schools for identification of health barriers to learning. Significantly more respondents from higher poverty considered the following to be health barriers to learning: disruptive behavior; asthma; fatigue (falling asleep in class); vision problems; poor diet; hunger; problems accessing care; and lack of exercise. These data are summarized in Table 2.

Resources

Nearly all respondents (98%) reported that their school had a nurse who is physically present at the school 5 days a week. Only 17% reported that mental health services were available and adequate to meet their schools' needs, while 19% reported mental health services were available but not adequate. The remaining 64% reported that mental health services were not available at their school.

Among all respondents, the needed health resources identified with the greatest frequency were linkages with organizations that can provide services and resources at the school (64%), resources to promote family involvement (63%), consultation to train and assist school staff in managing difficult behavior (62%), and mental health services (62%). Significant difference between higher and lower poverty schools were reported for the following: resources needed to promote family involvement with the school (66% in higher poverty schools vs. 49% in lower poverty schools), need for mental health services (65% vs. 49%), need for a school-based health center (43% vs. 26%), and additional resources to support vision screening follow-up services (38% vs. 25%). These data are summarized in Table 3.

Table 3. Type of Resource Needed as Reported for Higher Compared With Lower Poverty Schools.

Types of resources needed to address the health problems	Higher poverty group ≥70% FRPL (n = 320)		Lower poverty group <70% FRPL (n = 88)	
	%	n	%	n
Links with organizations that can provide services and resources at school	67	213	57	50
Resources to promote family involvement*	66	212	49	43
Consultation services to train and assist staff in managing difficult behaviors	61	194	67	59
Mental health services*	65	209	49	43
Training for school staff	51	162	51	45
School-based health center*	43	138	26	23
Resources to support vision screening or follow-up services*	38	123	25	22
Health education for students	33	104	31	27
Access to info on whether student has access to health care	26	83	24	21
Support with managing asthma in school	25	79	24	21
Assistance with obtaining info on students' health problems	25	81	22	19
Resources to support hearing screening or follow-up services	20	63	16	14
School-based health professionals	15	47	13	11

Note. FRPL = free or reduced price for lunch.

*Difference between <70% FRPL and ≥70% FRPL significant at the $p < .05$ level.

Discussion

This survey, the first of its kind in NYC, revealed that school leaders who responded have a broad conceptualization of “health” that is not restricted to traditional medical issues. Moreover, they see a wide range of health issues among their students and perceive that many health issues are interfering with student learning. Health barriers reported by the respondents include medical, mental health, developmental, and psychosocial issues. These findings are consistent with several of Basch’s previously summarized priorities (vision problems, asthma, aggressive and violent behavior, inattention and hyperactivity, lack of opportunities for physical activity, and whether students had breakfast; Basch, 2011).

The importance of the findings from the present study lie not simply in the order in which health barriers were reported but in the degree to which almost all of the options were selected. All 22 of the health issues on the survey were perceived as a barrier to learning by between 12% and 87% of all respondents.

Among the health barriers reported were many conditions that are readily identifiable and treatable with appropriate screening and follow-up protocols. Vision problems (rated by 57% of respondents as a health barrier to learning), hearing problems (rated by 28% of respondents as a health barrier to learning), and dental pain (rated by 17% of respondents as a health barrier to learning) should all be relatively straightforward to identify and treat with comprehensive screening and follow-up. Moreover, asthma, contagious diseases, obesity, diabetes, and allergies are all generally highly manageable conditions with comprehensive pediatric primary care. Other conditions, including depression, anxiety, and stress; fatigue; self-injurious behavior; substance abuse;

and eating disorders often require more complex multidisciplinary interventions but can generally be investigated and managed in health care settings to help the child function at a significantly improved level.

Although all of the conditions examined in the study are health-related, potential solutions for each must also be conceptualized in the context of their social and political environments. Asthma and vision and hearing problems are perhaps the easiest to screen for and address in a more traditional health care model; however, as the survey data show, access to health care is perceived as a problem, especially by those serving lower income schools.

Mental health issues generally require coordinated care with a primary care provider and often a mental health provider/team. In many areas of NYC, and across the nation, mental health services are not consistently available or accessible to children in need (Thomas & Holzer, 2006). The degree to which respondents reported having inadequate mental health resources indicates the importance of improving school-based mental health services and access to community-based services. When accessing community services, additional issues may arise with coordination of care across sectors.

Schools may be able to at least partly address issues relating to hunger, obesity, and poor diet by making nutritious breakfast and lunch available to students. There are also opportunities to control the kinds of snack food that are available during the school day (e.g., through improved vending machine choices) and to provide additional opportunities for physical activity.

The analyses revealed that many of the health barriers to learning were reported at significantly higher rates by the leadership of higher poverty schools. The parallel patterns of

the achievement gap, health disparities, and access barriers all work against students in higher poverty communities. This highlights the need to focus on the ways that these factors intersect, influence, and exacerbate each other. Focusing on health barriers in the context of learning may be an effective way to do this.

The principals and assistant principals who responded to the survey indicated that many types of resources were needed to address health problems in their schools. Although 98% of the respondents in the analytic sample reported that their school had a nurse who was present 5 days per week, the level of need for health care services during the school day may far exceed what one professional can manage. The number of survey respondents endorsing the need for additional support, training, and health/mental health resources underscores this additional need.

Study Limitations

Despite its strengths, this study has the limitations that are typical for survey research. Although the survey was sent to representatives of all 1,700 NYC public schools, the final response rate, although adequate for an online survey, included school leaders from only 36.8% of those schools. The survey sample over-represented leadership from higher poverty schools, and those principals and assistant principals reported a higher degree of concern about health issues. This suggests that a motivation to participate in the survey was related to the respondents' degree of concern about the issue addressed and their role as health barriers to learning. As is also typical for survey research, the responses represent the impression or perception of the respondent. All percentages reported should be understood to represent the percent of schools in the analytic sample, not of students within those schools.

Because of the bias toward higher poverty children in the NYC public schools and in the analytic sample, caution must be exercised in generalizing these findings to diverse public school systems. The higher proportion of respondents from higher poverty schools, and significant differences between their responses and those from lower poverty schools suggests that these results are representative of principals and assistant principals in schools in which a strong majority of students were in families with annual incomes <185% FPL. For a more general understanding of health barriers to learning in schools, a respondent sample serving more socioeconomically diverse students would be necessary.

Conclusion

The results of this study suggest that NYC public school leadership is aware of the presence of health problems in its schools, and it is making a connection between many health conditions and their potential to affect student learning.

Those involved in efforts to engage schools, gain buy-in, and identify solutions should consider the fact that health-related barriers are already likely to be “on the radar” of principals and assistant principals, and that these school leaders will likely be ready to participate in generating solutions and willing to help effectuate change.

There are strong perceptions among NYC public school principals and assistant principals that health problems, many of which should be readily preventable, identifiable, and effectively managed or treated, are creating significant barriers to learning for their students—particularly in schools with the highest percentage of poor children. School leaders report inadequate resources to meet those needs, a need for resources to support increased parental engagement, and feel their students would benefit from stronger partnerships with medical and mental health providers and other community health support systems.

There is a need for further research into the most impactful and cost-effective ways for this to happen. This study highlights the need and opportunity for more emphasis to be placed on ensuring that potential health barriers to learning are effectively identified, prevented, managed, and/or treated wherever possible. The first step is to increase and improve comprehensive screening for medical, mental health, and psychosocial conditions. This should be a national priority, especially directed toward the most economically disadvantaged children. Increasing collaboration between the health and education communities and the engagement and empowerment of parents can help ensure that children are given every opportunity to meet their full potential.

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Declaration of Conflicting Interests

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Notes

1. Working with hospital and health center partners, Children's Health Fund (CHF) operates a national network of programs, most of which are school-linked, that provide health care to medically underserved children.
2. The Council of Supervisors and Administrators (CSA) is a membership and collective bargaining organization of New York City (NYC) school principals, assistant principals, and other supervisors and administrators.

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Roy Grant is Senior Director of Research at Children's Health Fund. After a three year term on the Editorial Board of *American Journal of Public Health* he began as a Department Editor for the Journal in January 2014. Mr. Grant is a psychotherapist and child development specialist with early childhood specialization.

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