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RESEARCH ARTICLE

Healthier Students Are Better Learners: High-Quality, Strategically Planned, and Effectively Coordinated School Health Programs Must Be a Fundamental Mission of Schools to Help Close the Achievement Gap

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ABSTRACT

OBJECTIVE: To discuss implications for educational policy and practice relevant to closing the achievement gap based on the literature review and synthesis presented in 7 articles of the October 2011 special issue of the *Journal of School Health*.

METHODS: Implications for closing the achievement gap are drawn from analyses of current literature.

RESULTS: During the past several decades, school reform efforts to close the achievement gap have focused on various strategies, yielding very limited progress. Educationally relevant health disparities influence students' motivation and ability to learn, but reducing these disparities has been largely overlooked as an element of an overall strategy for closing the achievement gap. If these health problems are not addressed, the educational benefits of other school reform efforts will be jeopardized.

CONCLUSIONS: Healthier students are better learners. School health programs and services that are evidence based, strategically planned to influence academic achievement, and effectively coordinated warrant validation as a cohesive school improvement initiative for closing the achievement gap. National, state, and local responsibilities for supporting school health are outlined, including shared strategies; leadership from the U.S. Department of Education; policy development; guidance, technical assistance, and professional development; accountability and data and software systems; and a research agenda. To date, the U.S. Department of Education has not provided leadership for integrating evidence-based, strategically planned, and effectively coordinated school health programs and services into the fundamental mission of schools. Now is an opportune time for change.

Keywords: child and adolescent health; coordinated school health programs; academic achievement; achievement gap; socioeconomic factors; school reform.

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Elementary and secondary education for American urban minority youth is in crisis. Levels of academic achievement are far too low. A large proportion of youth drop out before completing high school. Too few who do complete high school attend and complete college. The status quo does not bode well for the economic security and quality of life of future generations or for maintaining the vitality of American democracy.

Youth at greatest risk for adverse educational outcomes share many underlying risk factors with youth at greatest risk for adverse health outcomes and largely represent the same segments of the US population. Both educational and health disparities are caused, to a great extent, by a common set of environmental factors. There is compelling evidence that the environment, educational outcomes, and health outcomes are causally related in reciprocal ways and that educational and health disparities independently affect each other. Children's health factors have been implicated as causal mechanisms in the link between low socioeconomic status and educational attainment.

Health disparities affecting youth are shaped by interrelated factors within the social environment. Attacking the underlying causes of educational and

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health disparities—poverty, noxious physical and social environments, inaccessibility of health care and social services, segregation and racism—is a moral necessity. There are no simple solutions to these complex and recalcitrant problems, and schools should not be solely responsible for addressing them.

Nevertheless, investing social resources in schools is one of the most powerful ways to shape the lives of youth. School reform efforts during the past several decades have focused on a variety of strategies, for example, improving teachers' ability to teach, modifying curricula, increasing school financing, and, most recently, establishing academic standards that hold school personnel accountable for students attaining goals as measured by standardized tests. However, to the extent that school improvement efforts do not increase students' motivation and ability to learn, the yield on investments will be limited. Although reducing educationally relevant health disparities can powerfully enhance students' motivation and ability to learn, this strategy has not been explored as a missing link in school reform efforts.

MAKING HEALTH A FUNDAMENTAL PART OF ELEMENTARY AND SECONDARY EDUCATION

No matter how well teachers are prepared to teach, no matter what accountability measures are put in place, no matter what governing structures are established for schools, educational progress will be profoundly limited if students are not *motivated and able to learn*. Health-related problems play a major role in limiting the motivation and ability to learn of urban minority youth, and interventions to address those problems can improve educational as well as health outcomes. This is why reducing educationally relevant health disparities must be a fundamental part of school reform.

Healthier students are better learners. The average citizen would consider this common sense. Recent research in fields ranging from neurosciences and child development to epidemiology and public health provide compelling evidence for the causal role that *educationally relevant health disparities* play in the educational achievement gap that plagues urban minority youth.

School leaders must prioritize how to use scarce resources to address the critical health problems affecting youth. In the analysis presented in this special issue of the *Journal of School Health*, 3 criteria used for establishing priorities were prevalence and extent of health disparities negatively affecting urban minority youth, evidence of causal effects on educational outcomes, and feasibility of implementing proven or promising school-based programs and policies to address the health problem. Based on these criteria, 7 educationally relevant health disparities were selected as strategic priorities: (1) *vision*, (2) *asthma*, (3) *teen pregnancy*, (4) *aggression and violence*, (5) *physical activity*, (6) *breakfast*, and (7) *inattention and hyperactivity*. Many other health problems affecting youth are also important, and the particular health problems deemed most important in a given school or school district will vary.

The health factors specified in this special issue affect a large proportion of American youth. Visual problems have been estimated to affect 20% of youth. Asthma affects an estimated 14% or 9.9 million youth under 18 years old. An estimated 8.4% of school-aged youth, 4.6 million, have received a diagnosis of ADHD, with millions more exhibiting symptoms of inattention and/or hyperactivity that are below established diagnostic criteria but nonetheless adversely affect teaching and learning. One in 3 American female adolescents is expected to become pregnant. Aggression and violence are a pervasive part of daily life for American youth, including at school. The majority of school-aged youth do not meet recommended levels of daily physical activity. Millions of youth do not eat breakfast on any given day. Urban minority youth from low-income families are disproportionately affected by all of these problems. The lowest ''performing'' schools have a particular need to address these health factors as a fundamental part of their mission. If these factors are not addressed, the benefits of other educational innovations will be jeopardized.

Educationally relevant health disparities impede motivation and ability to learn through at least 5 causal pathways: *sensory perceptions*; *cognition*; *connectedness and engagement with school*; *absenteeism*; and *dropping out*. Some health factors influence primarily 1 pathway while others influence multiple pathways. The causal pathways themselves are interrelated: for example, the student who is struggling cognitively is likely to feel less connected and less inclined to attend, which will further undermine educational progress.

The causal connections between *multiple* health factors and motivation and ability to learn will be greater than the effects of individual factors. This is based on the expectation that at least some variance would be additive. However, it is reasonable to believe that the functional effects of reducing multiple impediments to motivation and ability to learn (eg, breakfast, physical activity, sleep) would be not only additive but also synergistic; therefore, school health programs must focus on *multiple* educationally relevant health disparities to maximize the educational yield from investments.

Schools cannot address all of the conditions that cause educational or health disparities, but proven and promising approaches exist and must be applied to help close the achievement gap. Children should receive corrective care to enable them to see well enough to acquire basic academic skills such as reading and mathematics. Children with poorly controlled

asthma deserve in-school monitoring to help ensure that they receive health care consistent with current standards of care, including use of appropriate medications to control symptoms; the right to attend a school that strives to identify and ameliorate allergens, irritants, and pollutants that trigger symptoms; multiple opportunities for daily physical activity; and other aspects of an ''asthma friendly'' school. Children need to learn and practice communication and social skills, such as resisting social pressures, negotiating in ways to minimize interpersonal conflict and maximize teamwork and cooperation, and values such as individual- and mutual-level responsibility, which can reduce risk for various health-compromising outcomes, including unintended pregnancy, HIV, and other sexually transmitted infections. For youth who are sexually active, contraceptive services should be available. For youth who become pregnant, health and social services for unmarried teen mothers and their children are essential if there is to be any hope of interrupting the intergenerational transmission of poverty.

Children have the right to attend a school that is safe, but data unequivocally demonstrate that this is not the case for most urban minority youth. Correcting this is essential and warrants being a top priority in every school in the nation. Progress in this regard will be greatly influenced by the school climate. Measures of school climate should become a norm within measures of accountability—if the school climate is poor, connectedness and engagement in school will be less likely, which in turn will adversely affect educational as well as health outcomes. Youth who exhibit disruptive or aggressive behavior need attention during the early stages of development of these antisocial behaviors. Youth have the right to multiple daily opportunities for physical activity and to daily breakfast. Youth with attention and hyperactivity problems need help in learning ways to improve their mental and behavioral performance and, when parents and pediatricians agree, pharmacological treatment.

CREATING EFFECTIVE AND EFFICIENT SCHOOL HEALTH PROGRAMS

Most schools are already devoting some attention and resources to addressing important health barriers to learning, but these efforts are too often poor quality, not strategically planned to influence educational outcomes, and not effectively coordinated to maximize linkages between different school health components. Social resources for schools should never be squandered on ineffective programs, but, in the context of the current US economy, there is a particular need to ensure that scarce social resources are used effectively and efficiently to improve students' motivation and ability to learn.

High-quality, strategically planned, and effectively coordinated school health programs would be expected to comprise health education curricula, physical education and physical activity programs, nutrition services, physical and mental health services, family and community involvement, and attention to maintain a safe and supportive environment. Many existing resources describe the evidence-based policies, guidelines, standards, and practices that are associated with high-quality implementation of each of these program elements. What has been lacking is a set of strategies for motivating and enabling school leaders, teachers, and educational stakeholders to put high-quality school health models into practice in their schools. After discussing the 3 elements necessary for effective and efficient school health programs—high quality, strategic planning, and effective coordination—national, state, and local strategies for helping schools implement such programs are presented.

High Quality

Decades of investment by the Department of Health and Human Services and other federal and nongovernmental organizations (NGOs) have produced school health programs with proven effectiveness or promising results. But progress in developing and rigorously evaluating school health approaches has been far greater than putting the new knowledge gained into practice to create high-quality health programs in the nation's schools.

Guidelines for school health have been proposed by Division of Adolescent and School Health at the Centers for Disease Control and Prevention (CDC) along with a model for coordinated school health, which includes 8 components: health education; physical education; health services; nutrition services; counseling, psychological, and social services; healthy school environment; health promotion for staff; and family and community involvement (www.cdc.gov/healthyyouth/sher/standards; www.cdc.gov/healthyyouth;www.cdc.gov/healthyyouth/CSHP). The Association for Supervision and Curriculum Development has proposed a ''New Compact for Learning,'' focusing on the whole child and emphasizing the importance of school health as a fundamental mission of schools (www.ascd.org/ASCD/pdf/Whole%20Child/WCC%20Learning%20Compact.pdf). With support from the Health Resources and Services Administration, a group of more than 30 national organizations led by the American Academy of Pediatrics and the National Association of School Nurses, has described health, mental health, and safety guidelines for schools, including guidelines for family and community involvement, health and safety education, physical education, health and mental health services, nutrition and food services, physical environment and

transportation, social environment, and staff health and safety (www.nationalguidelines.org).

The CDC's School Health Index, a self-assessment and planning guide, can help school leaders determine the extent to which schools are implementing evidence-based health policies and practices, identify weaknesses and develop plans for improvement while engaging stakeholders in the process (www.cdc.gov/HealthyYouth/SHI/introduction.htm). This tool would be even more useful if it was linked with a solutions database, especially if the software built in strengths and limitations of available resources. The Health Education Curriculum Analysis Tool (www.cdc.gov/HealthyYouth/HECAT/index.htm) and the Physical Education Curriculum Analysis Tool (www.cdc.gov/healthyyouth/PECAT) can be used to help ensure that curricula are aligned with the characteristics of effective health promotion curricula and the national standards for each of these fields.

There are also several key federal agency repositories of proven or promising school health interventions. These resources can assist school leaders in adopting approaches that are most likely to have a substantial, positive impact on educationally relevant health disparities. The Substance Abuse and Mental Health Services Administration's National Registry of Evidence-Based Programs and Practices includes interventions to prevent as well as treat mental and substance use disorders (http://nrepp.samhsa.gov); the Office of Juvenile Justice and Delinquency Prevention reviews programs and services concerning aggression and violence, among other topics (eg, delinquency, gang activity) (www2.dsgonline.com/mpg); Find Youth Info, an interagency US government Web site (that appears to be under further development and expansion) provides guidance for creating, implementing, and maintaining effective programs for youth, including various proven or promising intervention approaches (www.findyouthinfo.gov); and the CDC links to various registries of programs for reducing youth risk behavior (www.cdc.gov/healthyyouth/AdolescentHealth/Registries.htm). Despite the availability of consensus guidelines and online access to proven or promising school health approaches, it appears that high-quality programs are not being implemented in the nation's public schools serving urban minority youth. For example, federal, state, and local agencies have been investing in school-based drug abuse prevention for decades, but a recent study demonstrated that the majority of schools in the United States were implementing drug prevention programs with no evidence of effectiveness.[1] This was never tenable and, in the current economic climate, squandering limited resources on ineffective programs should be strongly discouraged.

Strategic Planning

Debate about which health problems were prioritized in analysis presented in this special issue and which were not discussed (eg, tobacco, alcohol, and drug use; obesity; ear infections; dental problems; speech impairment; immunizations; and unintentional injuries) is a distraction and far less important than the underlying premise, namely that healthier students are better learners and that the most sensible approach to address educationally relevant health disparities through schools is through an ongoing process. The expectation is not that every urban public school should have the same priorities. Selection of the health factors to be focused upon in a given school system may vary based on geographic variation in distribution of health problems, local leadership priorities, existing school and community resources, and historical efforts and programs, among other factors.

An *ongoing process* is needed to *maximize the yield from investments*. The need for an ongoing process is not only to sustain efforts once initiated, but to adapt priorities as problems and opportunities change. The nature of this process may vary from one school system to another, but would entail ongoing assessment of health problems affecting local youth to identify school health priorities; planning, implementing, and maintaining multiple efforts to address the specified school health problems coherently; and cultivating involvement and capacity for identifying and solving school health problems. The CDC's School Health Index can help schools engage in this process.

Descriptive epidemiological data (eg, prevalence, severity, consequences) are needed to assess the kinds of health problems that are most important to address. Examples of data sources that school leaders can use to help identify the most important health problems affecting local youth include the Youth Risk Behavior Survey (www.cdc.gov/HealthyYouth/yrbs/index.htm) and the Child Trends database (www.childtrends.org) maintained by the Annie E. Casey Foundation, as well as the Federal Interagency Forum on Child and Family Statistics (www.childstats.gov). Indices of crime and violence documented in the Uniform Crime Reports maintained by the US Department of Justice (www.fbi.gov/ucr/ucr.htm) are also applicable.

Once priorities are established, determining which school health approaches are planned and implemented must rely as much as possible on registries of effective programs, outlined above. In some areas (eg, violence prevention), evidence and guidance concerning program development is stronger than for others (eg, follow-up for vision screening). For all of the educationally relevant health disparities proven or promising approaches exist and should be put into use.

One of the most important challenges for strategic planning is cultivating involvement and capacity for identifying and solving school health problems. An

ongoing objective of the strategic planning process is, therefore, to provide opportunities and incentives for involvement and opportunities for professional development. A school health leadership team (or school health council) is a key vehicle to facilitate involvement of school board members, administrators, teachers, and community members to develop and implement school health programs that have local ownership. This will not only help ensure that the school health agenda is central to school improvement plans but that school health efforts are maintained even when there are personnel transitions.[2]

Effective Coordination

In effectively coordinated school health efforts, different groups of people playing different roles are working toward the same goals. While programs and policies may be funded from different sources (eg, agriculture, education, justice), and planned and implemented in ways that address the individual health priorities, these individual efforts should be conceptualized within the context of a larger school health mission established by schools or districts.

Effective coordination is intended to ensure that all of the different school health policies, programs, and services are collectively aimed at achieving a particular set of priorities. Coordination may focus on finding ways to reinforce efforts at the level of outcomes, mediators, implementation, or subgroups of students. For example, coordination focusing on increasing physical activity outcomes would reinforce learning objectives and opportunities for physical activity in multiple ways such as physical education, recess, brief in-class activity breaks, after-school programs, sports and physical activity programs, and events involving physical activity. Coordination focusing on school climate as a mediator would identify all of the opportunities to influence school climate and ensure that these different efforts provided a consistent message to students, for example, that courtesy and respect should characterize all interaction between and among people in the school community.

Coordination is also needed at the level of the individual student. It is important for teachers and the other personnel providing services to particular students to be aware of the different issues a particular student may be dealing with (within a context of respecting privacy). If a screening program identifies a student who needs eyeglasses to learn to read, there must be follow-up to ensure that the student receives an eye exam and eyeglasses, and that s/he wear the glasses while at home and school. Screening is most likely completed by health department personnel, but they are not responsible for follow-up. Parents must ensure that an eye exam is received and corrective lenses are obtained (and replaced if lost or broken) and are used at home. And teachers must ensure that students use their glasses as recommended in the classroom. A disconnect at any of these levels can result in a child struggling to read because s/he cannot see well. Similar circumstances prevail in dealing with students who have a chronic disease such asthma or ADHD.

Leadership at the school and district level is needed to provide oversight and linkages to the different aspects of the school health program, and to form partnerships not only within schools but also between school personnel and family and community resources. Community partnerships will have to be formed, as will liaisons between teachers and health care personnel. Leadership must also facilitate processes to help ensure continuity of care and follow-up.

Given the diverse nature of activities comprising school health, *a school health coordinator* is needed to help ensure synergy resulting from different efforts. As a key member of the leadership team, the school health coordinator can help ensure coherence from the overall effort. The school health coordinator's mission is vitally supported by the work of a school health council (or committee), comprised of representatives of the staff implementing key school health program elements, school administration, parents, students, and community-based organizations. The school health council can provide technical expertise, links to community resources, and a vehicle for obtaining community buy-in for policies and activities designed to address educationally relevant health disparities. The existence of a school health council serves to institutionalize the integration of health promotion into the fundamental mission of the school and increases the chances of health program sustainability. Almost two thirds of the nation's schools already have a school health council or some organized structure that provides guidance on school health program activities. Compared with schools that do not have such councils, schools with such a group are more likely to report having policies and programs related to health, mental health, and social services.[2]

NATIONAL, STATE, AND LOCAL RESPONSIBILITIES FOR SUPPORTING SCHOOL HEALTH

The decentralized nature of education in the United States provides a distinct social context for implementing reforms intended to improve teaching, learning, and educational outcomes. Addressing the educationally relevant health needs of youth through school can be accomplished best if there is alignment of federal, state, and local policies to form a coherent national agenda to close the achievement gap.

Federal policymakers have an increasingly large role in shaping educational reforms, with billions of new dollars and authority to establish accountability

standards derived from the No Child Left Behind legislation. However, most educational policies and funding for schools in the United States still come from states and communities. Local involvement and investment (of time and effort as well as financial resources) will ultimately determine the value of school health efforts.

Shared Strategies for Supporting School-Level Efforts

The first, and most immediate, step that national, state, and local leaders need to take to support the efforts of urban schools to address educationally relevant health disparities is to communicate clearly and powerfully that these efforts are an essential part of educational reform. The importance of using the bully pulpit to influence school-level practices should not be underestimated.

Ultimately, integrating school health efforts into policy mandates and the accountability structure are the most important ways to influence change. Federal and state policies and legislation strongly influence practices at the local level. State and federal policies need to identify the health needs that must be met to provide equal access to educational opportunity; the implementation of programs to address those needs can be supported through grants, technical assistance, and professional development. Health-related measures such as school climate and students' school connectedness warrant inclusion into accountability structures that assess academic outcomes and provide insight about the kinds of school improvement efforts that are needed to affect students' motivation and ability to learn. In addition to financial support, federal, state, and local agencies can support the school health agenda through guidance and technical assistance, data collection, and sponsored research.

Incorporating high-quality, strategically planned, and effectively coordinated programs into the lowest performing schools, where they are needed most, will be particularly challenging. Extra investments in school districts with the lowest local property tax base and the lowest levels of performance on national assessments are needed to help equalize opportunities for learning. Efforts to reduce disparities in educational outcomes cannot succeed without reducing disparities in educational opportunities for learning.

While NGOs cannot establish policy mandates or equalize school funding, voluntary health organizations, professional associations, and foundations do provide instrumental support through program grants, guidance and technical assistance, and support for data collection and research. These NGOs make enormous investments in improving the health of youth but tend to be focused categorically. When multiple private funding sources pool their resources, the nature and scope of efforts that becomes possible expands greatly. Likewise, guidelines and recommendations developed collaboratively by multiple NGOs can help shape a coherent national school health agenda to help close the gap in education and health.

Colleges of education in the United States have a central role to play in preparing the next generation of teachers and school leaders. The knowledge and skills required to implement high-quality, strategically planned, and effectively coordinated school health programs are diverse. Given the lack of attention this topic appears to receive in professional preparation programs for educational leaders and teachers, it is not surprising that many leaders and teachers are not motivated to become deeply involved with school health as a central part of their responsibility. Even those who recognize the significance of students' health as one of the important determinants of the success of teaching and learning may lack the skills to act on their motivation. With rare exception, there has not been any national-level effort among colleges of education to develop consensus about school health programs and policies. This reflects the peripheral place occupied by school health in American colleges of education. As greater expectations are placed upon teachers and school leaders to address health-related needs of youth, professional preparation programs have a responsibility to increase integration of health topics into curricula.

Recommendations. In summary, to support high-quality, strategically planned, and effectively coordinated school health programs, federal, state, and local governments can engage in the following types of activities:

1. Have leaders communicate clearly and powerfully that school health programs are an essential component of school reform.
2. Integrate school health efforts into policy mandates and accountability measures.
3. Provide extra investments in schools with the lowest local property tax base.

To support the efforts listed above:

1. NGOs can explore ways to pool their resources and influence to expand the scope of the programs they support and the impact of the guidelines and recommendations they issue.
2. Colleges of education should integrate health topics and skills in school health program management into their professional preparation programs for education leaders and teachers, and form school—university partnerships to facilitate implementation of programs and policies.

Leadership From the US Department of Education

The US Department of Education (USDOE) is in a pivotal role to influence the health of American

youth and their motivation and ability to learn. The current emphasis on performance standards illustrates its power to influence the nature and scope of teaching and learning in the classrooms and schools across America. However, focusing exclusively on standardized test score outcomes without also emphasizing the kinds of school health (and other) improvements that will influence students' motivation and ability to learn does not provide sufficient guidance to state governmental agencies or to local districts and schools about proven and promising approaches for attaining higher academic achievement standards.

This is an opportune time for change in America's schools. President Barack Obama's investment in America's educational system is unprecedented and stresses consolidation of fragmented and inefficient funding streams that will allow USDOE to fund proven or promising practices while providing greater technical assistance and support to grantees. Major new funding streams include Race to the Top, whose grants afford states substantial discretion in advancing reforms around 4 specific areas identified by USDOE (see below); School Turnaround Grants, which focuses on the 5000 lowest performing schools, many of which serve urban minority youth; and Teacher and Leader Innovation Fund, and Teacher and Leader Pathways, which focus on fostering the development of human capital devoted to education. These funding streams will invest billions of dollars to address 4 priorities, each one of which warrants inclusion of school health initiatives: (1) distribution of highly effective teachers; (2) focusing on the 5000 lowest performing schools; (3) improving longitudinal data systems that will link student-level data and be useful for planning and evaluating school improvement efforts; and (4) assessment and standards. Teacher effectiveness can be enhanced by awareness of health factors that adversely affect motivation and ability to learn, as well as by knowledge and skills that motivate and enable teachers to contribute to the overall school health initiative. The lowest performing schools are likely to have the highest prevalence of educationally relevant health disparities. To invest in school improvement efforts without addressing these problems fails to recognize some of the main impediments to teaching and learning that are amenable to change through implementation of existing proven and promising approaches.

Another new USDOE funding stream proposed by President Obama for fiscal year (FY) 2010 provides 1 vehicle for addressing educationally relevant health disparities. The Promise Neighborhoods program will support the development of comprehensive neighborhood programs designed to combat the effects of poverty by meeting the health, social services, and educational needs of youth who live in low-income communities. Grantees will be encouraged to coordinate their efforts with programs and services provided by other federal agencies. By addressing the health barriers to learning and fostering coordination across funding streams, Promise Neighborhoods has great potential for making an important contribution to reducing the educational achievement gap. However, to have a major impact, this approach will need a much greater investment to follow up the $10 million for planning grants proposed by the president for FY 2010.

The USDOE also needs to begin including student-level, health-related data in its longitudinal tracking systems; this would not only assist with identifying needs and establishing strategic planning priorities, but would also be useful for assessing the extent to which different approaches are resulting in desired improvements. Although school climate and school connectedness are centrally important to improving educational outcomes, they are not currently included in most educational data or assessment systems. Guidance and technical assistance with measurements from USDOE's Institute of Educational Sciences would be extremely helpful to schools as they develop state- and local-level tracking systems.

In the past, the USDOE has supported little research on the role of health in learning. In addition, it has typically not included educationally relevant health measures in its ongoing data systems, such as the Common Core of Data, which provides an annual comprehensive survey yielding comparative data across states, and the Statewide Longitudinal Data System Grant Program, which aims to help state-level personnel develop and use data systems that include linked student records for planning and evaluation.

Recommendations. The USDOE can only fulfill its mission of helping the nation's schools eliminate the educational achievement gap by helping schools eliminate health-related barriers to learning through actions such as the following:

1. Have departmental leadership consistently and passionately articulate in highly visible public forums the reasons why school health must be a fundamental part of school reform efforts.
2. Collaborate with other federal agencies, national NGOs, foundations, and state and local education stakeholders to develop a national strategic plan for supporting school health programs to eliminate educationally relevant health disparities.
3. Provide incentives for school leaders, teachers, and educational stakeholders to get involved with identifying high-priority, educationally relevant health disparities and to develop high-quality, strategically planned, and effectively coordinated school health programs to address these problems.
4. Include efforts to reduce educationally relevant health disparities as required or recommended activities in the huge, new grant programs being established, such as Race to the Top.

5. Ensure that new human capital grant programs, such as the Teacher and Leader Innovation Fund, support efforts to equip the next generation of educators and educational leaders with information about the impact of health problems on educational outcomes, as well as the knowledge and skills they need to implement high-quality, strategically planned, and effectively coordinated school health programs.
6. Integrate critical health-related measures, such as school climate and students' connectedness with school, into existing USDOE data collection systems.
7. Integrate into USDOE research agenda, in a meaningful way, evaluations of school-based efforts to reduce health-related barriers to learning.
8. Collaborate with other agencies to *pool resources*, develop policies, coordinate activities, *integrate data elements into ongoing surveillance systems*, and *create interagency grants* promoting the dissemination, implementation, and maintenance of high-quality, strategically planned, and effectively coordinated school health programs.

Policy Development

Current school health policies are an important indicator of where school health is prioritized within the overall education agenda. Stronger and more comprehensive school health policies are needed at the federal, state, and local levels. They should not only be consistent with laws governing school health and safety, but proactive in promoting health. Policies can encourage, if not require, districts and schools to invest in evidence-based programs and services based on national standards.

Flexibility is important in translating policies and guidelines into practice. To promote lasting change, state- and local-level involvement and flexibility are essential. A frequent reaction of local school administrators and teachers to a new policy is that it is out of touch with the realities of their local context; not compatible with local cultural values and perceived needs and interests; impractical given available versus necessary resources; or inconsistent with local values.

Fit, Healthy, and Ready to Learn, developed by the National Association of State Boards of Education, is a useful guide for state and local education agencies in developing and implementing school health policies (http://nasbe.org/index.php/shs/53-shs-resources/396-fithealthy-and-ready-to-learn-a-school-health-policy-guide). The National Association of State Boards of Education also maintains a database of state school health policies, which can provide reference points for leaders in state and local education agencies and help inform further policy development. The American Academy of Pediatrics' *School Health Policy Guide*[3] is another authoritative and useful guide to policy development and implementation for leaders in state and district education agencies.

Recommendations. Federal, state, and local governments can help schools eliminate health-related barriers to learning by adopting and implementing the following types of policy measures:

1. Require schools to include health goals in their mandated school improvement plans. This is perhaps the single most important policy that can be implemented, because it ensures that schools will be held accountable for their ongoing efforts and the success of their health policies and programs.
2. Ensure an ongoing process to create, implement, and maintain a high-quality, strategically planned, effectively coordinated school health program by, for example, requiring the establishment of a school health council or leadership team and supporting professional development of staff.
3. Ensure that a sufficient amount of curricular time is devoted to health education, with a particular focus on helping youth learn and practice social emotional skills that reduce susceptibility to health-compromising behaviors. The acquisition and maintenance of such skills, including noncognitive skills, requires time and practice. A high-quality health curriculum includes developmentally appropriate teaching and learning activities that have scope and sequence whereby cognitive, affective, and psychomotor objectives are built upon in a step-by-step fashion.
4. Adopt policies to address the educationally relevant health disparities discussed in this special issue. These might include
   - requirements for schools to follow up with students who ''fail'' vision screening to help ensure they receive adequate corrective services;
   - commit curricular time to implementing proven or promising curricula to prevent teen pregnancy, aggression and violence, and promote physical activity;
   - ensure that students with chronic disease such as asthma and ADHD receive health services that are consistent with current standards of care;
   - ensure that youth who become pregnant have support to complete school;
   - ensure multiple opportunities for daily physical activity;
   - provide universal breakfast; and
   - adopt measures designed to create a supportive *school climate*.
5. Address additional critical health needs by, for example, prohibiting all tobacco use in school buildings and on school grounds and establishing

nutrition standards to ensure that only healthy foods and beverages are available on campus.

Guidance, Technical Assistance, and Professional Development

Implementation of what we already know—translating current knowledge into practice—is the greatest challenge to immediate progress in reducing educationally relevant health disparities. Unfortunately, the school personnel who would be responsible for implementing high-quality, strategically planned, and effectively coordinated school health programs typically lack the knowledge, skills, and training needed to manage this work. Many school health program leaders have not been trained to identify evidence-based approaches or on how to adapt them appropriately to fit their communities; furthermore, they lack skills and information needed to stay up to date on the constantly changing research base of proven and promising practices.

Federal, state, and local agencies can meet a vital need by providing school personnel the guidance, technical assistance, and professional development they need to implement high-quality, strategically planned, and effectively coordinated school health programs. Government agency efforts can be complemented by support from NGOs and foundations. Without major efforts in this area, schools are not likely to succeed in reducing educationally relevant health disparities.

Schools and districts also can learn a great deal from each other through the development of *school health learning communities*. This approach to community development, which emphasizes maximizing community involvement and democratic decision making, has the advantage of yielding the most sustainable changes, but the disadvantage of requiring considerable time. While change is needed urgently, such longer term investments are warranted as well.

State-of-the-art professional development opportunities can give teachers the skills needed to implement evidence-based health curricula; identify youth with physical or mental health problems and know when and to whom referrals should be made; help students learn and practice critical social-emotional skills; and relate to students in ways that help them feel valued as people and achieve cognitive learning objectives. It is also critically important to provide professional development opportunities in school health for school principals, whose leadership is particularly important in effecting implementation of school health programs and policies. Principals influence which curricular priorities teachers focus on and model key behaviors that influence the social climate within schools. Professional development for principals can help ensure their appreciation of the health and learning connection, and how different kinds of school health programs and services can be implemented to reduce health-related barriers to students' motivation and ability to learn.

A major aspect of the US Department of Education's investment in the nation's schools is related to professional development. For example, the Teacher and Leader Innovation Fund is intended to support improvements in human capital systems and provide incentives for teachers and school leaders to work in the most challenging schools, and the Teacher and Leader Pathways authority supports alternative routes to certification and strengthening professional preparation programs. Such programs provide excellent opportunities to help both the current and the next generation of school leaders and teachers develop greater interest in and capability for reducing educationally relevant health disparities. This is particularly significant given that a substantial portion of the current teacher workforce will change in the next decade.

For preservice school leaders and teachers, learning opportunities in and out of the classroom are important. The system of apprentice models, whereby students gain experience under the supervision of well-qualified practitioners, is a proven model. Opportunities for school leaders, within and between schools, to network with each other enables them to share ideas and experiences, thereby gaining knowledge, skills, and appreciation of the importance of addressing health factors as prerequisites to achieving other teaching and learning objectives.

Support for training as a school health coordinator with the expectation that graduates will work in schools serving urban minority populations has never existed, but is desperately needed to support human capital development in this crucially important, yet generally overlooked, aspect of school improvement. Pre- and postdoctoral fellowships can provide incentives that enable and encourage talented individuals within the workforce to pursue careers related to school health and expansion of this element of the labor force is greatly needed.

Recommendations. Federal, state, and local governments can help schools eliminate health-related barriers to learning by implementing the following types of activities:

1. Intensive efforts to disseminate the most up to-date, evidence-based guidance, technical assistance, and professional development on all aspects of implementing school health programs to teachers, principals, preservice school leaders, and all other relevant school personnel.
2. Support with skills that local school personnel are likely to lack in areas such as data management and analysis; building a sustainable school health team; identification, tailoring, and implementation of proven and promising approaches; program monitoring and formative evaluation; and ongoing planning and evaluation.

3. Provision of ongoing follow-up consultation and support for school personnel as they experience challenges in implementing school health programs.
4. Providing opportunities for members of the school health teams across a state or region to share problems and strategies that were successful for addressing them in their districts.
5. Integration of professional development opportunities related to school health into the large USDOE human capital improvement systems.
6. Aid programs to support the training of school health coordinators for schools serving urban minority populations.
7. Awards for pre- and postdoctoral fellowship opportunities to expand the school health program workforce.

Accountability and Data and Software Systems

The issue of accountability has been a dominant theme in recent debates about education. Accountability is important given the extent of social resources invested in education and the importance of closing the achievement gap for the future vitality of the nation. Education and learning about health in schools is generally not measured. This is problematic not only because it suggests that such learning is not important, but also because, without such measures, it is difficult to assess which areas within the school health program do and do not need improvement. The inclusion of educationally relevant health factors as part of accountability measures for school improvement efforts is justified in terms of the effects of these factors on educational opportunity.

Measures of accountability for what students should know and be able to do relevant to health at various stages of development have been developed by the Council of Chief State School Officers (ie, Health Education Assessment Process), but these measures have never been widely used. This is telling in terms of the low priority school health has in the current conceptualization of education. At this point, consensus development is needed to conceptualize and operationally define teaching and learning outcomes, and other factors (eg, school climate, student connectedness, and engagement) relevant to school health.

Two data systems collected biennially by the CDC are the School Health Profiles and the Youth Risk Behavior Survey. The former tracks particular school health efforts occurring in the nation's secondary schools. The latter provides prevalence estimates of relevant health behaviors that influence current and future risk of morbidity and mortality among youth. These data systems provide useful measures for both evaluation and strategic planning at the state and district levels. Other relevant, existing data systems include School Health Policies and Programs Study, National Longitudinal Survey of Youth, National Survey of Children's Health, National Survey of Children with Special Health Care Needs, Vital Statistics routinely collected by the National Center for Health Statistics, National Health Interview Survey, National Asthma Survey, State and Local AREA Integrated Telephone Survey, National Health and Nutrition Examination Survey, Uniform Crime Reports, and Indicators of School Crime and Safety.

Development of national surveillance systems are needed relevant to incidence and prevalence of eye disease and vision problems affecting school-aged youth, as well as the extent to which youth receive vision screening and, more importantly, indicated follow-up care. Data systems are also needed to track process measures—intermediary factors presumed to mediate the relationship between school health programs and services and teaching and learning outcomes. These include data describing school climate and school connectedness.

Recent progress has been made in conceptualizing and measuring school climate as well as measures of student connectedness and engagement with school.[4] Such measures should be incorporated into all schools improvement plans, even if the goal is to maintain a supportive school climate and high level of school connectedness. Data systems to track school climate and school connectedness in all of the nation's urban public schools do not currently exist. These data are needed to help assess which schools are succeeding in maintaining a supportive school climate and enhancing student connectedness and engagement with school, which in turn will facilitate teaching and learning to improve students' test scores in mathematics, language arts and science, among other topics.

Software to help conceptualize, implement, and maintain high-quality, strategically planned, and effectively coordinated school health programs do not exist. Given the constantly changing scope of proven and promising approaches, useful software must be maintained on an ongoing basis. Software development, including capacity for linked student records, is an example of a project that requires interagency collaboration to help ensure that it is comprehensive, acceptable to the intended users, and relevant to school leaders' decisions for improving students' motivation and ability to learn.

Such software should be available within the public domain, along with support and technical assistance, to help school health program staff easily estimate the prevalence of behavioral risk factors affecting youth in urban areas; identify proven or promising approaches for given topics and age levels; and link deficiencies identified in self-assessment processes, such as the CDC School Health Index, to a solutions database providing guidance and suggestions that warrant consideration. In addition, software can be developed

to link data systems to inform school improvement decisions. Examples of relevant data to be linked include student emergency contact information; physical and mental health problems (eg, asthma, ADHD); medications, including ones to be taken at school; emergency response needs; vision screening results, whether follow-up care was obtained, and whether recommendations are followed; frequency of participation in physical activity; frequency of participation in breakfast; overall attendance; standardized test scores; grades; student's connectedness with school; teacher's ratings of student's attention/hyperactivity, aggressive, disruptive or violent behavior; disciplinary actions; counseling and psychological services provided; medical and dental care provided; and referrals for additional services and follow up to encourage referrals to be acted upon.

Recommendations. In summary, federal, state, and local governments can help schools eliminate health-related barriers to learning by implementing the following types of activities:

1. Systematically exploring how health-related measures can be integrated into accountability measures for school improvement efforts.
2. Assessing the extent to which existing health data systems are useful for monitoring educationally relevant health problems and can be used to guide national and state strategic planning and evaluation.
3. Supplementing existing data with measures of eye disease and vision problems, school climate, and school connectedness, among other factors, that should be collected routinely to assess needs, monitor changes, and plan and evaluate programs and services.
4. Convening stakeholders to develop a menu of potential health-related metrics that states and school districts could use for accountability.
5. Collaborating to develop software to help conceptualize, implement, and maintain *high-quality, strategically planned, and effectively coordinated* school health programs.

Research Agenda

The highest priority for research is to discover ways to put into practice what we already know. How can high-quality, strategically planned, effectively coordinated school health programs be widely disseminated, implemented, and maintained in the nation's schools serving urban minority youth? At an earlier stage of the research spectrum, the emphasis was on randomized trials designed to demonstrate program efficacy and effectiveness. Now the emphasis must shift toward understanding ways to implement proven and promising program approaches, in a strategic and coordinated way, in the challenging context of urban public schools.

Demonstration programs are needed to show what is possible. There is a large body of rigorous evaluative research demonstrating the efficacy of categorical programs. To date, there has not been any rigorous evaluation research on the potential of high-quality, strategically planned, and effectively coordinated school health programs on educational outcomes. Conducting this work during the coming years with dozens, if not hundreds, of schools can demonstrate the value of school health for enhancing students' motivation and ability to learn, and educational outcomes.

Participatory research is needed that involves school leaders, teachers, parents, and community members. This research should emphasize local significance and external validity. Large-scale funding mechanisms for this kind of research—focusing on multiple rather than categorical problems and specifically directed toward reducing educationally relevant health disparities—are not currently available. But this is precisely the kind of research that should be supported through pooled investments by funding agencies that share mutual goals related to education and health.

Little change in the nation's urban schools serving youth from poor families will occur without substantive and ongoing involvement of school leaders and teachers. The fact that there are virtually no useful data describing relevant characteristics of these stakeholders is telling. Do the nation's teachers believe that these issues are important? Do they feel that it is their responsibility to address health issues? Which health issues are deemed more or less important? Do educational leaders feel prepared to navigate their way through the morass of policies and resources and to conceptualize, implement, and maintain a coordinated and strategic school health program that is aimed at favorably affecting teaching and learning? If not, what kind of training, technical assistance, and other support would be most useful? What are the best ways to help school leaders and teachers design, implement, and maintain ongoing high-quality programs and services?

Other important groups about which little information is available are faculty and administrators in colleges and universities. Have faculty responsible for preparing the next generation of school leaders and teachers embraced the notion of coordinated school health? What are their beliefs about the importance of this versus other topics? To what extent do the presidents and deans at the nation's colleges of education believe that addressing students' health factors is central to the mission of schools? To what extent do curricula in professional preparation programs for teachers and administrators around the United States address the need for and approaches to coordinated and strategic school health?

Nearly all research on interventions to improve health outcomes among youth, mostly funded by the National Institutes of Health, has not measured impact on educational outcomes. At the outset of this special issue, a basic premise was that health and education are causally related in reciprocal ways. While the focus here has been on the ways that health factors adversely affect teaching and learning outcomes, there has recently been increasing recognition of the impact that education has on health status.[5,6] Given the mutual goals shared by social institutions concerned with education and health, greater collaboration is needed in developing investments to support an overall research portfolio for youth development.

Statistical models estimating effect sizes of health factors on educational outcomes are likely to yield underestimates. The data used for deriving these estimates and their relevance to urban minority youth are questionable. It seems likely that these effects are underestimated for a variety of reasons, for example, because they are calculated based on health factors considered *singly* rather than when *synergistically interacting* with each other. Measurement of educationally relevant health disparities in ongoing data systems maintained by the National Center for Educational Statistics that enable the linking of health and education data within individual respondents would be helpful in deriving more accurate effect-size estimates. Intervention research aimed at reducing multiple, educationally relevant health disparities would also provide direct evidence of the effect sizes that can be expected from high-quality, strategically planned, and effectively coordinated school health efforts. Currently, however, there is no empirical basis for estimating the effect size of the *collective and interactive* efforts that address multiple, educationally relevant health disparities simultaneously.

A panel convened by the National Academy of Sciences could be instrumental in evaluating the extent to which current knowledge supports the value of a nationwide investment in high-quality, strategically planned, and effectively coordinated school health programs as part of a national strategy for closing the achievement gap. Recommendations would be an important step in developing a national school health strategic plan and point to priorities that warrant the greatest investment of social resources.

Determining more precisely which federal agencies are allocating school health investments for which health problems and in which localities of the United States would be a useful step in identifying prospects for pooling investments. It is likely that a substantial portion of the current investment is being devoted to school health efforts that are too often low quality, categorical, and fragmented. To the extent that current investments can be reallocated to programs that are high quality, strategically planned, and effectively coordinated, a much better yield from current investment can be achieved.

Recommendations. Federal, state, and local governments can help schools eliminate health-related barriers to learning by implementing the following types of research activities:

1. Collaborating to develop a joint national research agenda that documents the impact of high-quality, strategically planned, and effectively coordinated school health programs on educational outcomes. These studies need to evaluate interventions that focus on multiple rather than individual categorical problems.
2. Conducting formative research to improve understanding about the motivations and skills of school leaders and teachers, as well as of faculty and administrators in the colleges and universities that deliver preservice education for school leaders and teachers.
3. Including educational outcomes as key measures in evaluations of interventions designed to promote the health of young people that are sponsored by health agencies.
4. Developing an empirical basis for estimating the collective and interactive effects of interventions to address multiple educationally relevant health disparities.
5. Documenting the extent and nature of current federal investments in support of school health programs.
6. Conducting research related to the kinds of evidence valued by state legislators with respect to supporting changes in policies and legislation to help ensure adequate educational opportunity by reducing educationally relevant health disparities.

Conclusions

If children cannot see well, if their eyes do not integrate properly with their brain and motor systems, they will have difficulty acquiring the basic and essential academic skills associated with reading, writing, spelling, and mathematics. If their ability to concentrate, use memory, and make decisions is impeded by ill-nourishment or sedentary lifestyle, if they are distracted by negative feelings, it will be more difficult for them to learn and succeed in school. If their relationships at school with peers and teachers are negative, they will be less likely to be connected with and engaged in school, and therefore less motivated and able to learn. If they are not in school, because of uncontrolled asthma or because they are afraid to travel to or from school, they will miss teaching and learning opportunities. If they drop out, perhaps because they are failing or faltering; or because they are socialized to believe that, even if they complete school, there will be no better opportunities; or because

they associate with peers who do not value school; or because they become pregnant and there are no resources in place that enable them to complete school while pregnant and after they have a newborn, it is not likely that they can succeed. If they cannot focus attention and succeed socially, it is unlikely that they will succeed academically.

Healthier students are better learners. Urban minority youth are disproportionately affected by educationally relevant health disparities. A substantial investment in health-related programs and services already exist in the nation's schools, including urban public schools. But because current programs are often low quality, categorical and fragmented rather than high quality (evidence based), strategic, and coordinated, the return on investments is limited. Despite compelling evidence linking health and academic achievement, there is no USDOE initiative to reduce educationally relevant health disparities as part of a national strategy to close the achievement gap. Consequently, the majority of the nation's schools have not implemented strategic or coordinated school health programs and policies. For the nation's schools to address educationally relevant heath disparities in a strategic and coordinated way there must be a fundamental social change in the goals of schools, the way schools are financed, the personnel and services available and accessible, and the amount of time devoted to help youth learn social-emotional skills. Such change will not occur without leadership at the USDOE. Now is an opportune time for such leadership.

Even if health factors had no effect on educational outcomes, they clearly influence the quality of life for youth and their ability to contribute and live productively in a democratic society. These are worthy goals for elementary and secondary education. Indeed, pursuing these goals is a moral imperative.

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