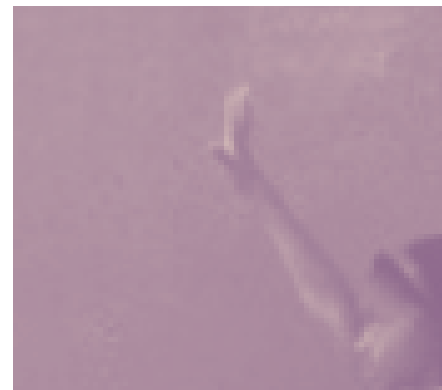
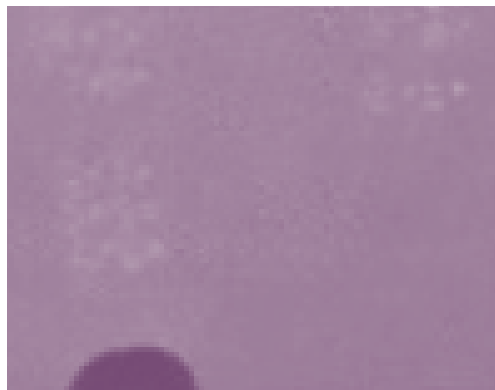


How Much Does It Cost?



Richard Rothstein
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October 2011

How Much Does It Cost?



**+ Achievable
Affordable** Providing Comprehensive Educational
Opportunity to Low-Income Students

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Executive Summary

Our nation's inability to narrow the achievement gap stems to a large extent from school reform initiatives that neglect the specific conditions in the lives of low-income students that contribute heavily to inadequate school performance. A new consensus is emerging that a more effective approach would be to prevent the achievement gap from emerging in the first place. This strategy would start with high-quality early childhood experiences and include adequate health care and high-quality after-school and summer programs, as well as school improvement.

This analysis estimates the cost of public policies to substantially narrow the achievement gap, if these policies begin early in the development cycle and build on previous success, rather than attempting to remediate past failures. The report models appropriate investments in prenatal, neonatal, infant, and early childhood development, followed by appropriate investments later to sustain the effects of such early interventions. It assumes that such a strategy could significantly inhibit development of the achievement gap in the first place, making it easier to sustain greater equality in outcomes through the school years. The full program covers a span of 18½ years, from the beginning of the second trimester of pregnancy to 18 years of age. It would take 18½ years to implement fully, because as each cohort matures, new services are added in each year. And each year, a new cohort is added to the model.

The model is comprised of the following components: The prenatal period is devoted to ensuring that all underprivileged pregnant women receive adequate prenatal and obstetric care, increasing the likelihood that each child is born with capacity to flourish. Family (parental support) services also begin in the prenatal period and continue throughout the full 18½ years of the child's development cycle. These services include visiting nurses from the second trimester of pregnancy until the child's third birthday, parent access to continuing education from the neonatal and infancy year until the child's 18th birthday, visiting home literacy coaches for low-income children ages three, four, and five, and school-based comprehensive service coordinators.

The neonatal and infancy year of the model, covering newborns to one year of age, introduces high-quality early childhood care and education that continues through age two. The model provides prekindergarten for ages three and four. Also introduced in the neonatal and infancy year is routine and preventive pediatric care, and routine and preventive dental and vision care are added soon thereafter. The program models all of these costs as provided in a school-based health clinic and continuing until the child's 18th birthday, which the model assumes occurs at the end of the normal senior year of high school. The model also provides for high quality after-school and summer programs from age five (kindergarten) to age 18.

The model assumes that the children eligible for these services are those who are eligible for the federally subsidized lunch program. In 2008, approximately one-third of all children in New York State were in such households. For each underprivileged family and child in New York City that takes advantage of all services recommended and modeled in this report, the estimated cumulative lifetime (to age 18) cost is about \$290,000, or an average annual per child cost of about \$15,700. If these costs were converted to New York State dollars, the lifetime per child cost would be approximately \$256,000 and the average annual per child cost would be about \$13,900. Assuming conservatively that each child would access 75% of the available services, the New York City annual cost would be approximately \$11,800 per child and the New York State cost approximately \$10,400.

This report is based on a November 2008 report prepared for the Campaign for Educational Equity at Teachers College, *Narrowing the Achievement Gap for Low-Income Children: A 19-Year Life Cycle Approach*, by Tamara Wilder, Whitney Allgood, and Richard Rothstein. The present report corrects some errors in the previous report and recalculates values in that report from national 2005 dollars to New York City 2010 dollars. Aspects of the model in the previous report have also been modified, based on recommendations of a task force convened by the Campaign for Educational Equity. Comments should be directed to riroth@epi.org. The authors are grateful to the Smart Family Foundation, the James and Judith K. Dimon Foundation, and the Robert Sterling Clark Foundation for support of this research. (References appear in the text as numbered endnotes and refer to the bibliography on p. 43; letters indicate footnotes.)

Skills beget skills, success breeds success, and the provision of positive experiences early in life is considerably less expensive and more effective than the cost and effectiveness of corrective intervention at a later age.

The cognitive and noncognitive performance of disadvantaged children (racial minority and those from low-income households) is consistently below that of middle-class children, with the gap ranging from 0.5 to 1.0 standard deviations, varying by the domain and age at which children were measured.² To close this achievement gap, educators have attempted a variety of compensatory policies, some quite expensive: among them have been reducing the size of classes and schools serving disadvantaged children; seeking to attract higher quality teachers to such schools; holding schools and teachers accountable for higher test scores and imposing penalties where test scores are low; issuing charters to organizations claiming innovative approaches; issuing vouchers for private schooling to disadvantaged children; providing additional time and tutoring for remediation; offering greater transfer rights for disadvantaged children to schools with higher average achievement; and providing special education resources to disadvantaged children to remediate learning disabilities. Yet none of these innovations has made much of a dent in the achievement gap. Although the mathematics achievement of black and white elementary school students has improved considerably since 1990, the gap in their achievement has not substantially narrowed.^a

This failure to substantially narrow the achievement gap stems from two related shortcomings. First, policymakers have placed nearly exclusive emphasis on reforming schools, when the specific conditions of lower-class existence contribute heavily to inadequate school performance. Low-income children often have no routine or preventive medical, dental, or optometric care, resulting in more school absences as a result of illness and even an inability to see well enough to read. Children in low-income families are more prone to asthma, resulting in more sleeplessness, irritability, and lack of exercise, as well as poorer attendance.³ Children born to low-income mothers have lower birth weight as well as more lead poisoning and iron-deficiency anemia, each of which leads to diminished cognitive ability, more behavioral problems, and more special education placement.⁴ Their families frequently fall behind in rent and move, so children switch schools more often, losing continuity of instruction.⁵ Poor children are, in general, not read to aloud as often or exposed to complex language and large vocabularies in their homes, so they begin school far behind in verbal ability, reasoning skills, and reading readiness.⁶ Their parents have low-wage jobs and are more frequently laid off, causing family stress that often leads to more arbitrary discipline at home and “acting out” in school.⁷ The neighborhoods through which these children walk to school and in which they play have more crime and drugs and fewer adult role models with professional careers.⁸ Children with poorly educated mothers are more often in single-parent families and so get less adult attention.⁹ They have fewer cross-country trips, visits to museums and zoos, music or dance lessons, and organized sports leagues to develop their ambition, cultural awareness, and self-confidence.¹⁰ Each of these disadvantages makes only a small contribution to the achievement gap, but, cumulatively, they explain much of it.¹¹

A second and related shortcoming has been policymakers' insufficient attention to the cumulative nature of academic failure and poor socialization. The achievement gap is present before children enter school. Thus, school interventions are necessarily compensatory — catch-up efforts to offset pre-existing inadequacy. An alternative and more effective approach would be to prevent the achievement gap from emerging in such magnitude in the first place. This insight has been promoted by Nobel laureate (in economics) James Heckman and by a National Academy of Sciences study on the neurobiology of early childhood development, *From Neurons to Neighborhoods*, by Jack P. Shonkoff and Deborah Phillips.¹² Heckman, Shonkoff, and their colleagues put it this way, as we cited in our head note: “[S]kills beget skills, success breeds success, and the provision of positive experiences early in life is considerably less expensive and more effective than the cost and effectiveness of corrective intervention at a later age.”¹³

^a Black 4th graders' scores on the NAEP Main Assessment were 188 in 1990 and 222 in 2009; white 4th graders' scores were 220 in 1990 and 248 in 2009 (data from NAEP Data Tool at <http://nces.ed.gov/nationsreportcard/>).

The foundations for learning both academic and behavioral knowledge and skills are best acquired early in life. Children whose development is healthy in the prenatal and early years are able to build on prior skill levels to develop increasing levels of competence. High quality early childhood programs also have power to alter lifelong outcomes.¹⁴ Research in cognitive science, such as the Shonkoff and Phillips volume, stresses the interdependence of environmental and genetic factors, and demonstrates that children's potential is less limited if healthy development begins early.

Heckman, Shonkoff, and their colleagues note that both academic and noncognitive achievement follow “hierarchical rules”:

Later attainments build on foundations that are laid down earlier... . [C]ognitive, linguistic, social, and emotional competencies are interdependent; all are shaped powerfully by the experiences of the developing child... . Although adaptation continues throughout life, human abilities are formed in a predictable sequence of sensitive periods,¹⁵

with prenatal development and early childhood the most influential. Heckman notes further that

[b]y the third grade, gaps in test scores across socioeconomic groups are stable by age, suggesting that later schooling and variations in schooling quality have little effect in reducing or widening the gaps that appear before students enter school...

At current levels of resources, society overinvests in remedial skill investments at later ages and underinvests in the early years.¹⁶

Although investments in older disadvantaged individuals realize relatively less return overall, such investments remain necessary. “[T]he advantages gained from effective early interventions are sustained best when they are followed by continued high-quality learning experiences.”¹⁷

National and state education policies have typically ignored both accumulated experience and careful research that confirms this insight. Policies have expected school reform alone to close the achievement gap. But the failure of the federal law, *No Child Left Behind*, to effect significant achievement gains for disadvantaged children has led many policymakers to re-examine their assumptions about the possible efficacy of isolated school reform. A new consensus is emerging. In January 2007, a group of educators and policymakers led by Vincent Ferrandino (executive director of the National Association of Elementary School Principals) and including Milton Goldberg (executive director of the commission that produced the Nation at Risk report in 1983) and Christopher Cross (assistant secretary of education in the George H.W. Bush administration), issued a report calling for a new “comprehensive, seamless approach to learning that values the distinct experiences that families, schools, afterschool programs, and communities provide for children.”¹⁸ In June 2008, Heckman joined with a group of prominent social scientists and policymakers from across the political spectrum in calling for a “Broader, Bolder Approach to Education.”¹⁹ They asserted that an effective strategy should start with high quality early childhood experiences, and include adequate health care and high-quality after-school and summer programs, as well as school improvement. And Heather Weiss and colleagues at the Harvard Family Research Project, in a report for the Center on Education Policy, have summarized the research findings and similarly called for policy to address the need for family support and high quality after school and summer programs for disadvantaged youth.²⁰

To support this emerging consensus, the analysis that follows undertakes to estimate the cost of public policies to substantially narrow the achievement gap, if these policies begin early in the development cycle and build on previous success, rather than attempting to remediate past failures. This report models appropriate investments in prenatal, neonatal, infant, and early childhood development, followed by appropriate investments later to sustain the effects of such early interventions. This report assumes that such a strategy could significantly inhibit the achievement gap from opening in the first place, making it easier to sustain greater equality in average outcomes through the school years. It is more expensive, and less effective, to attempt to remediate, later in childhood and adolescence, the failure to lay a firm foundation early in life.

Description of the Model

The full program covers a span of 18½ years, from the beginning of the second trimester of pregnancy to 18 years of age. To the extent possible, all costs have been expressed in dollars with New York City metropolitan area purchasing power in July 2010. For each disadvantaged family and child that take advantage of all services recommended and modeled in this report, the estimated cumulative lifetime (to age 18) cost is about \$290,000, or an average annual per child cost of about \$15,700. New York City costs are higher than state-wide costs. If these figures were converted to dollars with New York State purchasing power, the lifetime per child cost would be approximately \$256,000 and the average annual per child cost would be about \$13,900.^b

The model assumes that the children in New York State eligible for its services are those who are eligible for the federally subsidized lunch program. In 2008, approximately one-third of all children in New York State were in households whose income was less than 185% of the federal poverty line. The model further assumes that children who receive its services attend schools where all children are eligible for the services. In practice, there would be additional costs and organizational challenges presented by the need to deliver services to disadvantaged children who are not in such schools, and by the necessity of delivering services to children whose families had incomes above 185% of the federal poverty line but who attended schools where most children were from families with incomes below that cut-off.

As discussed below, all estimates in this report are of the total costs of recommended programs; they are not estimates of net new expenditures. Because many recommended programs may already be in place, either in whole or in part, net new expenditures could be less than the total cost modeled here. For example, Belfield and Garcia find that in New York City, approximately \$6,000 per capita annually may already be appropriated to fund services for low-income children similar to those recommended in this report.²¹ Calculations of the net new funding required for the services recommended here are not included in this report.

We use the term “disadvantaged children” to describe those for whom the recommended services should be provided, but the term is imprecise; “disadvantage” covers a wide range of challenges, some more serious than others. Thus, it is not possible to model a single set of services that would be appropriate for each child who now suffers from an achievement deficit attributable to his or her family's socioeconomic circumstances. The interventions and services required by the most severely disadvantaged children may not be required by those who are disadvantaged but not extremely so. For example, services required for children in foster care, or from households far below the poverty line, are more extensive than those required for children who are from borderline poor families. It is not practical in this report to create separate models for each of the many possible subgroups within the category of “disadvantaged.” Therefore, the model in this report is intended to substantially narrow the achievement gap for children who were in households whose income was between 75% and 185% of the federal poverty line and who take full advantage of all the resources recommended in this model. About 20% of all New York State children are from families with incomes in this range.

Although the resources recommended in the model are also needed by, and intended for, children whose households had income below 75% of the federal poverty line (about 14% of all children in New York State), it is not expected that these resources alone would suffice to substantially narrow the achievement gap, even if children took full advantage of all resources modeled in this report. Thus, for example, the model estimates the costs of providing family support services (nurse-home visitors in the very early years, and school social workers later) for children whose families have incomes below 75% of the poverty line, as well as for those whose families have incomes between 75% and 185% of poverty. For the former group, however, the family support services required to substantially narrow the achievement gap would likely be

^b The New York State Education Department has created an index of regional costs throughout the state, based on the relative wages of professionals in the various state regions. The most recent calculation is for 2009, and we have used this index for purposes of converting NYC to NYS dollars. See NYSED 2009. The statewide index number was provided to the authors by NYSED.

more intensive and more costly than the family support services modeled in this report.

If policymakers were to adopt the recommendations of this report, it would take 18½ years to implement the program fully, because as each cohort matures, new services are added in each year. And each year, a new cohort is added to the model.

In the first half-year of such gradual implementation, service would be provided only to one cohort of children in prenatality, and their mothers, and only for the last six-months of pregnancy. Following childbirth, the costs would grow, because services would then be provided in neonatality and infancy to the first cohort, plus prenatal services provided to the second cohort. By the last year of implementation, with all cohorts in the development cycle having benefited from necessary services for all 18½ years, we should expect a narrowing of the achievement gap, attributable to those children and families who took full advantage of the services offered, and especially for the 20% of children whose families have incomes between 75% to 185% of poverty.

Compensatory expenditures would still be required for cohorts that began their life cycles before the implementation of the model and that had not benefited from the earlier investments. These compensatory expenditures (not estimated in this report) would be in addition to the model's cost. Each year, however, as fewer cohorts who had not benefited from the earlier investments were moving through the development cycle, such compensatory costs should decline until, in the last year of the model, they were minimized to the greatest extent feasible.

Compensatory expenditures would also still be required for children who, although eligible, did not take advantage of services offered in the model. Further, to the extent the share of nonutilizers was significant, the impact of the model on children and families who used the services would be diminished; this is because one cause of low achievement of disadvantaged children is the concentration of such children in schools where low-achievement by most children is mutually reinforcing. Thus, for example, if large numbers of disadvantaged children in a school do not take advantage of the enriched experiences offered in an after-school program, the achievement of children who do take such advantage will still be partially influenced by their nonparticipating peers.

If in the first year of the program, all pregnant mothers in New York State, from households with incomes of less than 185% of the poverty line, received the recommended services during their second and third trimesters the total statewide cost would be approximately \$0.8 billion. In the second year of the model, if all neonatals and infants in New York State from households with incomes of less than 185% of the poverty line received the recommended services, the statewide cost for these services would be approximately \$4.1 billion, plus an additional \$0.8 billion for a new pregnancy cohort, for a second year total cost of \$5.0 billion. In the third year of the model, if all one year olds in New York State from households with incomes of less than 185% of the poverty line received the recommended services, the statewide cost for these services would be approximately \$2.7 billion, plus an additional \$0.8 billion for a new pregnancy cohort, and an additional \$4.1 billion for a new neonatal and infant cohort, for a third year total cost of \$7.7 billion. And so on.

Once the full 18½-year cycle has been completed, the annual New York State budgetary cost for serving all 19 cohorts simultaneously would be \$21.4 billion.

These estimates of budgetary cost, however, assume take-up rates for each of the services of 100%. However desirable this might be, this is not a realistic assumption. Not all children will attend after-school programs, and those who do may attend irregularly, reducing the need for staff in after-school programs. Not all eligible children will use a public clinic, rather than private physicians or rather than avoiding recommended care. Not all women will enroll for prenatal care, and not all parents will accept nurse home visitors or literacy coaches. Some children, although their families fall in the income-eligible group, are already receiving the services from private providers and will not move to public providers even if public services Winsurance and who would not use the services of a school health clinic.

Of course, to the extent children and families in need of these services fail to use them, this model program will fail to substantially narrow the achievement gap.

Some children and families will not utilize services even though they might benefit from them. For example, with intensive outreach efforts, prekindergarten programs implemented under the Abbott rules in New Jersey had a goal of enrolling 90% of all eligible children, and have succeeded in enrolling 82% after ten years of the program.²² The Abbott program begins for three year olds; the percentage would likely be much lower for programs, such as those modeled in this report, that offer early childhood care and education from birth. A survey of “quality” after-school and summer programs, conducted by Public/Private Ventures and by The Finance Project, found that 79% of elementary and middle school participants attended all of the time, and 64% of teen participants attended all or most of the time.²³ However, the survey makes no effort to estimate the share of eligible youth in a community who enroll as participants, nor is it possible to say how these shares might increase with intensive recruitment. Current private providers of after-school programs report that only about 50% of eligible youth enroll in these programs even where they are freely available, and, of those that enroll, few attend on every day that programs were offered.^c There is no way to know how this share might increase with intensive recruitment.

A realistic budget impact estimate, therefore, would assume less than 100% participation. If, for example, the average participation rate for all programs in the model was 75%, the first, second, and third year total budgetary costs would be \$0.6, \$3.7, and \$5.8 billion, respectively, and once the full 18½-year cycle had been completed, the annual budgetary cost for serving all 19 cohorts simultaneously would be \$16.1 billion.

Note that our estimate of the average annual per-child cost for this model when fully scaled up after 18½ years of about \$15,700 in New York City, and about \$13,900 in New York State as a whole, is below econometric estimates made of the cost of substantially narrowing the achievement gap for disadvantaged children.²⁴ This is plausible because, as we discussed above, it is less expensive to prevent the achievement gap from opening in the first place, with appropriate early childhood investments, than it is to attempt to remediate children’s academic and social shortcomings after these shortcomings have become well established.

These are also not net new costs to the city and state. The city and state, as well as private social welfare agencies and employers, each already expend substantial sums on the services provided in this model. Medicaid is perhaps the largest example. State and city social welfare agencies are another. After-school programs, such as those offered by the Children’s Aid Society, are another. Private employers of low-wage workers may provide health insurance to reimburse some of these expenditures.

Furthermore, if the model is successful, savings in current expenditures will also be realized. For example, providing high quality early childhood care and education to disadvantaged infants, toddlers, and preschoolers should lead to reduced identification of students as in need of special education services, leading to significant savings. Educators now generally agree that is essential to maintain higher teacher to pupil ratios in the primary grade classrooms of disadvantaged children. If, however, these children come to school ready to learn at grade level, these excess teacher costs may no longer be necessary. Likewise, educators now propose teacher salary bonuses to induce experienced teachers to work in school serving disadvantaged children. Again, if these children come to school prepared for grade-level work, it may not be necessary to offer such additional inducements to teachers, or, at least, the inducements may need to be significantly smaller.

^c A task force convened by the Campaign for Educational Equity reviewed an earlier draft of this report. The task force included representatives of private providers of after-school programs in New York City; this estimate was offered by these members.

This report, however, makes no attempt to put a precise figure on such savings. This report is only concerned with estimating the total costs of providing a full 18½-year cycle of appropriate services, without regard to the extent to which these costs are net new costs. For illustrative purposes, however, in Appendix A, we do explore the issue of the extent of savings that might be realized in reduced special education costs if the model were to be adopted.

Throughout this report, we refer to program years mostly by the age of children eligible in that year, but readers may sometimes find it helpful to convert these references to the model year, or to the school grade of eligible children. Because the model's resources become available in the year before birth, program years are two years greater than children's ages. Table 1 will assist readers in following the chronology of the model.

Table 1. Age and Grade Table for Model		
Age of Child	Model Year	Grade of Child
Prenatal	1 (0.5)	
Neonatal and Infancy	2	ECCE*
1	3	ECCE
2	4	ECCE
3	5	Pre-k
4	6	Pre-k
5	7	k
6	8	1
7	9	2
8	10	3
9	11	4
10	12	5
11	13	6
12	14	7
13	15	8
14	16	9
15	17	10
16	18	11
17	19	12

* ECCE = Early Childhood Care and Education

It will also be helpful to keep in mind that when we refer to services provided for children from a younger age “to 18 years of age,” we are referring to a group whose oldest members are children who are 17 years old. For simplicity, the model necessarily assumes that all children are born at the beginning of the second model year, and continue to receive services until their 18th birthdays, at the end of the 19th model year.

Components of the Model

The model is comprised of the following components:

The prenatal period is devoted to ensuring that all disadvantaged pregnant women receive adequate prenatal and obstetric care. Such care would make healthy births to their children more likely, but still not as certain as for middle-class women, because healthy births are predicted not only by adequate prenatal and obstetric care but also by conditions that are more difficult to influence, such as freedom from stress.²⁵ Nonetheless, the prenatal year program could make more likely the delivery of children with capacity to flourish.

Family (parental support) services also begin in the prenatal period. Such services continue throughout the full 18½ years of the child's development cycle. These services take the form of visiting nurses from the second trimester of pregnancy until the child's third birthday, parent access to continuing education from the neonatality and infancy year until the child's 18th birthday, comprehensive service coordinators beginning for three year olds and continuing until the child's 18th birthday, and visiting home literacy coaches for children ages three, four, and five.

The neonatality and infancy year of the model, covering newborns to children one year of age, introduces high-quality early childhood care and education (ECCE). The model continues to provide ECCE until children's fifth birthday. ECCE for three and four year olds may also be referred to as pre-kindergarten.

Also introduced in the neonatality and infancy year is routine and preventive pediatric care. The program models these costs, which soon also include routine and preventive dental and vision care, as provided in a school based health clinic. (If provided elsewhere, the costs would not be significantly different.) The services of school-based health clinics continue until the child's 18th birthday, which the model assumes occurs at the end of the normal senior year of high school.

For five year olds (children in kindergarten), the model provides for high quality after-school and summer programs. The cohort should also continue to benefit from such programs until its 18th birthday.

In the following pages, we estimate the per-child cost of each of these resources. As noted above, as resources for subsequent years accumulate, we estimate a total cost for the full 18½-year developmental cycle, concluding with a child's 18th birthday, assumed to be equivalent to the time of graduation from high school.

Beginning in the year following the model's initial implementation, prenatal costs begin for a new cohort, and this pattern continues for each year of the model. All resource costs are duplicated for each succeeding cohort. Table 2 displays the model components, and the ages at which their services are provided.

Table 2. Summary of 18½-Year Plan to Narrow the Achievement Gap

Child's Age	Intervention
Prenatal	● ●
Neonatal and Infancy	● ●
1	● ● ●
2	● ● ●
3	● ● ●
4	● ● ●
5	● ● ● ●
6	● ● ● ●
7	● ● ● ●
8	● ● ● ●
9	● ● ● ●
10	● ● ● ●
11	● ● ● ●
12	● ● ● ●
13	● ● ● ●
14	● ● ● ●
15	● ● ● ●
16	● ● ● ●
17	● ● ● ●

- Adequate Prenatal Care
- Family Support
- High Quality Early Childhood Care and Education
- Routine and Preventive Pediatric Care
- High Quality Before- and After-School and Summer Programs

Summary of Component Costs

The approximate costs, in 2010 New York City dollars, for each program component of the model are

1. Adequate prenatal and obstetric care for mothers in the prenatal year: approximately \$17,000 per mother, or \$900 per child as an average annual cost for 18½ years.
2. Family support services,
 - a) beginning with nurse-family partnerships for mothers for 3½ years, beginning for the last six months of the prenatal year (i.e., the second and third trimesters of pregnancy) and continuing until the child's third birthday: an average annual cost per child of \$7,700 for 3½ years, or less than \$1,500 per child as an average annual cost for 18½ years;
 - b) providing the opportunity for parents to supplement their own education during all 18½ years of the program, because greater parental education can contribute to children's achievement: \$1,100 per child as an average annual cost for 18½ years, assuming that one parent per child enrolls each year in further education;
 - c) continuing with school comprehensive service coordinators, beginning with the child's third

birthday and continuing until the child's 18th birthday: an average annual cost per student of \$500 for 15 years, or \$400 per child as an average annual cost for 18½ years;

- d) and providing home literacy coaches for families of children three, four, and five years of age: an average annual cost per child of \$5,800 for three years, or \$900 per child as an average annual cost for 18½ years;

Considering all family support services together – nurse-family partnerships, parental education, school comprehensive service coordinators, and home literacy coaches, the average annual cost for 18½ years for family support services is \$4,400 per child.

3. High quality early childhood care and education for one year olds and continuing to the children's fifth birthday, including prekindergarten for three and four year olds: an average annual cost per child of \$18,600 for five years, or \$5,000 per child as an average annual cost for 18½ years.
4. Routine and preventive health care for newborns, infants, children, and their parents for each year of the program, beginning with newborns: an average annual cost per child of about \$500 beginning after the first six (prenatal) months of the program.
5. High quality after-school and summer programs, beginning for five year olds and continuing for each additional year of the program: an average annual cost per student of about \$5,400 for 13 years, or \$4,500 per student as an average annual cost for 18½ years.

Additional Limitations of and Cautions Regarding the Model

The practical utility of the specific amounts represented by the model is further limited by the following considerations:

a) No account is taken of possible later savings. As Heckman, Shonkoff, and their colleagues point out, we presently not only underinvest in early years, but overinvest in later years. The model described in this report only estimates the cost of appropriate investments in the early years and of investments needed to sustain the effects of the earlier programs. It does not estimate savings that might also accrue if the later years' overinvestment could be reduced once the model program was implemented. For example, we expect that special education costs would be reduced as children with healthy experiences in the prenatal months and in neonatality, infancy, and early childhood have fewer developmental, behavioral, and cognitive disabilities. Compensatory education expenditures for older youth during the regular school day might be less necessary if these students participated in high quality after school and summer programs. Perhaps class sizes could be increased to more typical levels once a cohort was better prepared earlier in life to benefit from education in school.^d Perhaps it would be easier and thus less expensive to attract and retain skilled teachers for the later grades at schools serving disadvantaged children, once a cohort was more adequately prepared for grade level work. We should also expect other governmental expenditures to be offset. For example, the costs of controlling crime (including prisons) and of welfare should fall if disadvantaged youth had better cognitive and noncognitive skills. More productive workers should generate higher tax receipts. Such savings have been estimated previously, and especially in a volume edited by Clive Belfield and Henry Levin summarizing an earlier symposium of the Campaign for Educational Equity.²⁶

^dIn 2007-2008, the average elementary school class size in New York State was 18. The average classroom teacher salary was \$62,332. There were 102,626 elementary school teachers. (NCES 2009, Tables 65, 67, and 79). Thus, the average savings in teacher salary for classroom teachers of disadvantaged students for each one-pupil increase in statewide average class size would be approximately \$3,500. However, not all class sizes could be increased as a result of this program, but only those serving disadvantaged children whose need for compensatory class size reduction was diminished. There would be no comparable savings for nonclassroom teachers. And there would be some offsetting additional costs – capital costs for increased classroom space. As an order of magnitude only, we estimate an overall statewide savings of over \$100 million in reduced compensatory class size reduction costs.

Although the cost estimates in this report have not been reduced by possible savings, for illustrative purposes, Appendix A to this report discusses reductions in special education expenditures that could occur if the model described in this report were implemented.

b) No account is taken of existing partial public implementation of some model elements. Some of the resources this model proposes are already provided, entirely or in part, in some places, and some of their costs are already embedded in public budgets. For example, some disadvantaged women and children presently receive health services whose provision is reimbursed by Medicaid, S-CHIP, and other public health programs. Some schools serving disadvantaged children already have health clinics that provide some or all of the services proposed in the model.⁹ Some disadvantaged children already benefit from high quality early childhood care and education programs (including some Head Start programs) or from high quality after-school and summer programs, particular beginning at age three.

This report makes no attempt to subtract from its cost estimates what the public already spends on these adequate programs. For illustrative purposes, however, Appendix B explores the extent to which existing Medicaid policies might cover health costs that are included in the model. Without the ability to precisely identify existing expenditures, wherever they may exist, it cannot be possible to estimate the net new cost of implementing an adequate prenatal to 18 years-of-age model program. However, because of these expenditures already committed, the new public money required to implement this program fully should have less than the budgetary impact set forth in this model.

c) No provision is made for recapture of displaced private spending. In presenting this model, we also acknowledge that some of its required public expenditures could displace private spending, also resulting in less net new total (public and private) spending than the model implies. For example, some excellent after-school programs are presently provided by organizations such as the Children’s Aid Society, the YMCA, the Boys and Girls Clubs, and others through philanthropic funding. Some low-income families use private primary care physicians for routine and preventive health care for their children, paid for by employer-provided private insurance. The model makes no adjustment for such private spending, nor do we propose any strategy for recapture of private spending that could be withdrawn if the model were implemented and private funds were replaced by public funds.

d) Estimates of ongoing compensatory spending for earlier cohorts are not included in cost estimates. As noted briefly above, if the model presented here were to become policy, remedial and compensatory spending would continue to be required for earlier cohorts who were still proceeding through childhood and adolescence, without having benefited from the model program’s components early in life that would have prepared these youths to succeed in school. The cost estimates set forth in this report do not include the funds presently spent on attempting to remediate at later ages the absence of adequate resources spent on development at earlier ages. If policymakers were to adopt the model proposed here, applying it to new birth cohorts, they would be obligated to continue to spend inefficient funds on remediation of earlier cohorts. Thus, for the first 18 ½ years of policy implementation, a declining level of compensatory spending would exist side-by-side with the costs of the model. Spending during this period would exceed the estimates of the model, until the model was fully implemented and savings could be realized.

e) No assumption is implied that existing middle class education is adequate. This report only estimates the costs of an 18½-year program to narrow the achievement gap – in other words, to bring disadvantaged children closer to the cognitive and noncognitive achievement levels presently reached by typical middle class children. The costs we estimate are not the full costs of an “adequate education,” but only the incremental costs of bringing disadvantaged children to the existing middle class level. Thus, we do

⁹ For example, as of 2002, there were approximately 1,500 health clinics in schools nationwide, providing primary care either by on-site physicians, nurse practitioners, or physician assistants, or by nurses with electronic connections to primary care physicians. In 1994, there were only 600 such clinics. In 31 states, primary care by nurse practitioners was Medicaid-reimbursable in 2002 (Health in Schools 2002).

not consider the additional costs of making a typical middle-class education more adequate.

f) Model resources might still be insufficient for children who are most severely at risk of failure. The model estimates costs of services for children from families with incomes of less than 185% of poverty. But the theoretical focus of the model is children from families with incomes of from 75% to 185% of poverty; we expect that the services provided in the model would give these children a meaningful opportunity to significantly narrow the achievement gap. Nonetheless, this focus – children from households with income between 75% and 185% of the poverty line – must be artificial, because most prior research on which this report relies has not attempted to specify the appropriateness of services for this slice of the disadvantaged child population. Some research demonstrating the effectiveness of particular interventions, such as early childhood and home visiting programs, has concerned extremely poor children, and some research demonstrates that the interventions proposed are more effective with the most severely disadvantaged children.²⁷ Nonetheless, children from households with incomes below 75% of poverty are more likely to have unique problems (e.g., foster care, homelessness, dysfunctional family life, neglect, infrequent parental or guardian employment) that require added services whose inclusion would add great complexity to this model. It is appropriate to begin this project by costing out services that would enable children who are close to the poverty line to substantially narrow the achievement gap. Such children are eligible for free and reduced-price lunch programs. Modeling the cost of the additional services required for more severely disadvantaged children could be a subsequent step – with a probable goal more modest than substantially narrowing the achievement gap.

Table 3 summarizes the income to poverty ratios of New York State households with children in 2008. Data in column 4 refer to the children for whom services in this report should be expected to substantially narrow the achievement gap. The costs calculated in this report are generally those that would be incurred by an effort to provide recommended services to all children counted in column 5. Note that the share of children in New York State living in households with incomes of less than 185% of the poverty line, 34%, is virtually identical to the share of children nationwide living in such households.

Table 3. Children in Low-Income Households, U.S. and New York State, 2008

% of Children, 0-18 Years, in Households with Income to Poverty Ratio of						
	Total # of Children, 0-18 Years	(1) Less than 100%	(2) Less than 75%	(3) From 75% to 125%	(4) From 75% to 185%	(5) Less than 185%
U.S.	72,825,003	18.2%	12.7%	9.3%	21.5%	34.2%
N.Y. State	4,345,364	19.1%	14.2%	8.6%	19.5%	33.7%

Source: U.S. Census Bureau, American Community Survey (ACS) 2008

More recent data are now available and would show a significantly larger proportion of children from families with low incomes. However, it is more appropriate to use 2008 data for the estimates in this report, because more recent data are inflated by the effects of the current economic recession. Although poverty data for any year necessarily combines data for families who are episodically poor and data for families who are permanently poor, the necessity of the services modeled in this report are most essential for the latter group. Data for 2009 and 2010 include a much larger proportion of cyclically poor families, relative

to structurally poor families. Even the 2008 data show a poverty rate inflated to some extent by the current recession.²⁸ Of course, if the recession continues for a long period, the structurally poor group will grow.

g) The model falsely assumes that the real resources (personnel and capital) required to implement the model are available or can be developed within the 18½-year time frame. The model we present is an idealized one. It imagines a gradual implementation over the course of 18½ years. In practice, however, it would likely take considerably more than 18½ years to implement such a model because of resource constraints. For example, establishment of health clinics in schools may be constrained by the availability of facilities or by the supply of nurse practitioners and other medical professionals, making it unlikely that the model could be implemented within the 18½-year time frame we propose.

In estimating the cost of the model, we use existing compensation levels for qualified professionals in New York City. We do not estimate the additional compensation that would be required to substantially expand the supply of such professionals. Thus, the model's cost estimates may be understated in this respect.

h) All costs have been converted to real dollar values. The research upon which this model relies was conducted in various years, and some of it was conducted in other states. All cost estimates have been adjusted to reflect average New York City costs for 2010. There is no precise way to convert dollars in other locations to New York City values, and no precise way to estimate the inflation over time of particular resources used in the model. Our initial cost data for salary levels were developed from those reported by the Bureau of Labor Statistics' (BLS) Occupational Employment Statistics for the New York City metropolitan area. To make New York statewide estimates, we utilized a regional cost index, developed by the New York State Education Department (NYSED), based on relative salary levels of professional workers in various regions of the state.²⁹ To convert estimates from models developed for other states, we utilized a state-by-state comparative wage index commissioned by the National Center for Education Statistics (NCES).³⁰ Both the NYSED and NCES cost adjustments are based only on the relative salary levels of professional workers. Although professional workers are the predominant resource in our model, the model also includes paraprofessionals, clerical workers, supplies, equipment, and capital expenditures. The assumption that the intrastate and interstate relationships of these resources are similar to those of professional workers is unsupported at this time. Further, the NYSED index was last calculated in 2009, and the NCES index was last updated for 2000. The assumption that the relativity of costs by regions has been unchanged since these times is unsupported, but no more recent data are available.

An interactive Excel workbook accompanies this report and provides detail regarding sources for each element in the table.^f In cases where no sources are provided, the best judgment of the authors was used.

i) Capital costs (or their rental equivalence) are inconsistently included in these calculations. The costs of school-based health clinics estimated in this model include capital facilities because we assume that existing schools cannot accommodate clinics without extensive construction and renovation. Capital costs have also been included for the early childhood care and education program and for after-school and summer programs. In the latter case, such programs can typically use existing school facilities, so new construction would not be required. However, proper accounting would apportion an appropriate share of capital costs for schools to this after-school program. In the case of other elements of the model, however, capital costs have not been included. For example, existing school facilities may or may not be able to provide office space for the coordination of nurse home visitors, of home literacy coaches, or of comprehensive service coordinators. If they cannot do so, then the lack of an estimate for capital facilities for these services represents an underestimate.

^f For a copy of this workbook, please contact the first author.

j) No attempt has been made to account for the possible savings that may result from service integration or other service delivery collaborations that actual implementation of the model might engender. So that costs can be estimated, this model program is based on current systems for delivering services; however, as a result of current funding mechanisms and other factors, current service delivery tends to be segregated within a single child service area, which can result in a lack of coherence in how people are served, duplication of effort, and discontinuity of service. It is likely that, as additional public funding becomes available to phase in the types of services provided through the model, new opportunities and incentives will arise for collaboration and coordination to improve efficiency and effectiveness in the delivery of services to children and families. We do not attempt to adjust costs to capture these potential changes to service delivery systems that might make them more efficient.

Model Components

Prenatality: Adequate Prenatal Care

Disadvantaged women are less likely to get adequate prenatal care.⁹ Inadequate prenatal care increases the risks for maternal, neonatal, and infant mortality as well as low birth weight and premature births.³¹ Low birth weight also predicts poorer educational outcomes later in life.³² To avoid these negative outcomes, pregnant women should routinely see a physician during pregnancy.

The American College of Obstetricians and Gynecologists (ACOG) and the American Academy of Pediatrics (AAP) recommend that regular doctor visits should be scheduled at one month increments with the onset of pregnancy, every two weeks in the 7th and 8th months of pregnancy and weekly in the 9th month. During these visits, doctors should also provide guidance regarding adequate nutrition (daily intake of all essential vitamins and minerals, and additional iron and folic acid) for pregnant women, and should urge mothers to avoid the dangers of lead exposure, smoking and alcohol consumption during pregnancy. Recommended tests for complications, such as the Rh factor and congenital abnormalities, and ultrasound examinations to monitor fetal development, are also components of adequate prenatal care. At least one postpartum doctor's visit is also recommended.³³

Even with this comprehensive program, healthy birth may still be at risk due to factors that medical care cannot easily manipulate — such as stress. However, adherence to the model of adequate prenatal care outlined here can make a significant positive impact on the life chances of children born to economically disadvantaged mothers.

Obstetricians typically bundle the costs of prenatal care and delivery in a single fee. The estimate we use in this model is based on average costs for recommended prenatal care and delivery services. We calculated the median costs of the recommended services from a study of a sample of 106 claims of women covered under the Maryland Health Insurance Plan (MHIP) in 2006. The MHIP program provides health insurance to high risk women and its payment levels are consistent with other commercial insurance plans in Maryland.^{h34} The high-risk sample, and MHIP's use of ACOG- and AAP-recommended care levels, distinguish this study from others and make it the most suitable from which to derive an estimate for our model.³⁵

The median cost is estimated for uncomplicated pregnancy and vaginal delivery and uncomplicated C-section delivery. Most pregnancies result in a vaginal delivery but about 30% result in a C-section.³⁶ To

⁹In previous work (Rothstein and Wilder, 2005, pp. 26-27), we reported that 25% of black mothers get no prenatal care during the first trimester of pregnancy, while 11% of white mothers get none. For black mothers, 6% get no prenatal care at all (or get it only during the last trimester, when it is almost too late) but only 2% of white mothers, one-third the number of blacks, get no or too-late care.

^hMHIP defines "high risk" as individuals "who cannot obtain health insurance coverage...[either] because of pre-existing medical conditions...[or] the benefits [of private insurance] are limited because of your health condition" (State of Maryland, 2008, p. 2). Pregnancy is one of the qualifying medical conditions, making all pregnant uninsured Maryland residents eligible for MHIP.

estimate the median cost of prenatal care for all types of deliveries, the cost estimates for each type were weighted by the national frequency of each type of delivery.

The estimate is of allowable charges actually paid by MHIP, not billed charges, because the true cost of prenatal care is what doctors and hospitals receive for their services. In addition to allowable charges, the model includes out-of-pocket costs, estimated from the cost of deductibles, co-insurance payments, and co-payments in traditional health plan policies. Out-of-pocket costs vary by type of delivery, with pregnancies resulting in uncomplicated vaginal births having a median out-of-pocket cost of about \$1,300, or about 15% of the total costs, and pregnancies resulting in C-section deliveries having out-of-pocket costs of about \$2,000, or about 18% of the total costs. Based on these data, and after adjusting the Maryland 2006 data for 2010 New York City metropolitan area prices, the model estimates a total cost of adequate prenatal and obstetric care to be about \$17,000. The estimate does not include expenditures for a small proportion of cases with complications (e.g., gestational diabetes, HIV-transmission, extreme prematurity, etc.). Table 4 describes these calculations in more detail.

Table 4. Prenatal Year: Prenatal Care	
Allowed Insured Cost (\$2006, Maryland)	
Prenatal Care	545
Vaginal Delivery	9,115
Cesarean Delivery	11,908
Out of Pocket Expenses (\$2006, Maryland)	
Vaginal Delivery	1,455
Cesarean Delivery	2,244
National Incidence	
Vaginal Delivery	70%
Cesarean Delivery	30%
Average Cost (\$2006, Maryland)	12,201
Average Cost (\$2010, Maryland)	13,970
Average Cost (\$2010, NYC)	17,020

From Birth to 18 Years of Age: Family Support

a) During Pregnancy, and for One and Two Year Olds: Nurse-Family Partnerships

Pregnant women, particularly those with low levels of education and economic hardship, require additional support beyond that provided by good medical care. To estimate the cost of this additional support, the model relies upon the program specifications of the Nurse-Family Partnership (NFP), a model program for parent education during and following pregnancy. The NFP provides registered nurses (RNs) who make routine home visits to disadvantaged mothers during pregnancy and for at least two years subsequent to delivery. Typically, visits begin early in the second trimester at weekly increments for the first month, and then every other week for the duration of pregnancy. The frequency of visits increases to once each week during the first six weeks following delivery, and is then reduced to every other week from the 6th week to the baby's first birthday. Visits continue every other week until the baby is 20 months of age. Monthly visits then continue for another four months, until the child's second birthday.³⁷

The model of this report extends NFP to include home visits for an additional year, up to the age of three. It is logical to do so, because the model (see below) proposes new family support services that are attached to preschool, beginning at age three. Extending the NFP for two year olds avoids a lapse in family support services between the usual end of nurse home visiting programs for one year olds and the beginning of family support services for three year olds in preschool. We have no authorities upon which to rely for determination of the frequency of visits during this gap year, but, for the purposes of cost calculations, we assume that during this final year of nurse-family support services (for two year olds), nurses should make monthly home visits.

During pregnancy, visiting RNs help mothers complete 24-hour diet histories, plot weight gains, coordinate visits with physicians, assess use of cigarettes, alcohol, and illegal drugs, and, if necessary, devise behavioral-change strategies to reduce use of such substances. Nurses educate women on the symptoms and signs of complications, encourage women to discuss potential complications with their doctors, and facilitate compliance with treatment. Nurses concentrate their efforts on conditions associated with poor birth outcomes, such as urinary tract infections, sexually transmitted diseases, and hypertensive disorders of pregnancy.

After childbirth, the nurses' goal is to help mothers improve the physical and emotional care of their children. RNs teach parents to recognize signs of illness, take temperatures, and communicate with doctors' offices about their children's illnesses before seeking care.

The nurses also work to enhance parent-child interactions. Nurses help parents to understand their infants' and toddlers' communicative signals, enhance parents' interest in playing with their children in ways that promote emotional and cognitive development, and help to create safer households for children. Nurses also help women establish and clarify their own goals, to solve problems that may interfere with their educations, finding work, and planning future pregnancies.

High-quality evaluations of the NFP have found significant positive effects on pregnancy outcomes, child health and development, and family economic self-sufficiency.³⁸ Specifically, randomized field trials of the NFP in several geographic locations found improved prenatal health, fewer subsequent pregnancies, increased maternal employment, and increased intervals between births for mothers; and fewer childhood injuries and improved school readiness for children.³⁹

The NFP also produces benefits that persist over time. By age 15, children have experienced a 48% reduction in abuse and neglect, a 59% reduction in arrests, and a 90% reduction in adjudications as persons in need of supervision for incorrigible behavior.⁴⁰ By the time their children were 15, mothers who had

participated in the NFP had 61% fewer arrests, 72% fewer convictions, and 98% fewer days in jail.ⁱ⁴¹

The model's estimate for this family support program assumes that nurses can visit an average of four families a day. We assume that NFP nurses are operating in neighborhoods where there is a high concentration of low-income women, so four visits a day are feasible. If more extensive travel time between visits were required, this assumption might not be valid. The model also provides one nurse supervisor and one data entry/support person for every four nurses. Other costs include office and medical supplies (including literature for parents), and mileage costs for nurses. The estimate also includes costs of ongoing professional training for nurses and program technical support.

The per family costs of a nurse home visiting program similar to the NFP, an annual average of \$7,707 for 3½ years, are displayed in Table 5. Our model assumes that these are per-child costs, although in families that have more than one child younger than three years of age, the per-child costs would be reduced.^j

Table 5. During Pregnancy, and for One and Two Year Olds: Nurse-Family Partnership				
Nurse-Patient Load (Visits per Week)	20			
Annual Nurse Visits	920			
Compensation (estimated, \$2010, NYC)				
Nurse	\$100,668			
Nurse Supervisor	\$142,303			
Clerical Support	\$47,307			
Child's Age	Prenatality	Infancy	One Year Olds	Two Year Olds
Visits per Child	15	29	21	12
Costs per Child				
Personnel	4,675	9,150	6,689	3,786
Supplies, Materials, Administrative Costs	364	713	521	295
Personnel Training and Education	150	294	215	122
Total per Child (\$2010, NYC)	5,189	10,157	7,425	4,203
Average Annual Program Cost (3½ Years): \$7,707				

ⁱAlthough this report makes no systematic attempt to estimate long-term savings from the model (see endnote 25 for some discussion of cost-benefit ratios), NFP generates long-term public savings. Every dollar invested in the NFP results \$5.70 in benefits for the highest-risk participants (Karoly, Kilburn, and Cannon, 2005). Every dollar invested in the NFP for the entire participant pool, including the highest-risk participants, results in a \$2.88 benefit (Aos et al., 2004).

^jTo use its scarce resources most efficiently, the Nurse Family Partnership organization only makes its services available to first-time mothers, hoping that mothers will carry over their learning from the nurses to their subsequent pregnancies and childrearing. We do not estimate savings from eliminating this service for mothers who have older children. Certainly, there will be some carry-over learning, but it will not be total, and subsequent children may present different challenges to mothers.

b) For Parents of Children from Birth to 18 Years of Age: Parent Education

There is a strong positive relationship between parental involvement in children's education both in school and at home, and children's educational outcomes, their positive attitudes, and their avoidance of truancy and dropping out.⁴² This is a widely and long-accepted view; the Parent-Teacher Association was established in 1910 to institutionalize these positive relationships between parents and schools.⁴³

Positive parental involvement includes "parenting," the everyday things parents do in the home that support children as students, such as making sure they are fed before school and get enough sleep at night; "communicating," the home-to-school and school-to-home dialogues about school programs and children's progress; "volunteering" in the classroom and at school, helping teachers, administrators, students, and other parents; "learning-at-home" activities such as help with homework and other curriculum-related activities; "decision making" in which parents function as school-community leaders; and "collaboration," outreach to community resources and services to strengthen school programs.⁴⁴

Student achievement is also strongly associated with parents' own educational attainment. Perhaps parents with more education place a higher value on educational success, and communicate this to their children.

Our model includes an instructional program to develop parents' capacity to engage in a range of parenting and other educational activities. The model is influenced by the Parent Academy, a program of the Miami-Dade County Public Schools that has been successful with such instruction. It offers courses at higher education facilities throughout Dade County on topics such as "Early Literacy," "Parenting for Drug Prevention," "Help Your Child Succeed in Math," "Story-telling," "Financing Your Child's College Education," "Achieving the Dream: Owning Your Own Home," and "Workforce Readiness."⁴⁵

The model assumes that one parent in each family enrolls in the equivalent of six community college credits each year. Although the participation rate will not be this great, the model does include visiting nurses for mothers and children up to the age of three, home literacy coaches (see below) for three, four, and five year-olds, and school comprehensive service coordinators (see below) for families of children from three to 18 years of age, all of whom can encourage parents to enroll in educational courses and assist them in doing so. This encouragement could cause enrollment to rise. However, our model also includes some duplication of services, which could reduce the costs. Part of the responsibilities of visiting nurses for mothers and children up to the age of three, and of home literacy coaches (see below) for three, four, and five year olds, is to teach parenting skills such as those covered in some of the Miami-Dade courses described above. Parents in these years still may enroll in courses covering other topics.

For an estimate of the cost of a course, we take the 2009-2010 tuition-and-fees rate charged by Kingsborough Community College and assume that a single two-semester course represents six credits.^k Results are displayed in Table 6.

Table 6. Education for Parents of Children from Birth to Age 18

Community College Tuition and Fees 2009-10, NYC

For 6 credits over 2 semesters	\$1,264
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^k An alternative method for estimating the cost of parental education is to consider the courses developed especially for parents by the Philadelphia school district through its "Parent University." The costs of these courses are as follows: \$500 per parent per semester for academic classes, e.g., GED, reading, and math; \$375 per parent for nonacademic classes, e.g., health and wellness, parenting, and computer training; and \$200 per parent for cultural enrichment, which includes trips and museums. The courses are actually provided free of charge to parents of Philadelphia school children, but the cost to the system in 2009-10 for a parent who took one of each of these courses in a year was \$1275 (2009-2010 Philadelphia dollars), approximately the same amount as yielded by the calculation in the main text (The School District of Philadelphia, 2011; private communication, Karren Dunkley, Deputy Chief, Office of Parent, Family, Community Engagement & Faith-Based Partnerships, School District of Philadelphia, Nov. 15, 2010).

c) Years 5–19: School Comprehensive Service Coordinator

To encourage parent involvement in schools and to provide parents with information about school services and those provided by other social service agencies and institutions of youth development, comprehensive service coordinators can serve as bridges between homes and schools, and be available to answer parents' questions about school policies, events, and rules.¹ Comprehensive service coordinators should be knowledgeable about services provided by other family support institutions and institutions of youth development, and maintain relationships with community groups that can supplement school and home resources. Coordinators also work with the director of the school health clinic (see below) to ensure that parents follow-up with referrals and recommended medical treatments and that children maintain their regularly scheduled clinic visits for routine and preventive care.

Parent coordinators are sometimes found in schools serving low-income families today, but most often these are paraprofessionals whose role is primarily to engage parents in schooling and who are not qualified to make judgments leading to formal referrals to other institutions. These paraprofessionals have recently been added to school staffs, either because the schools never had fully qualified social workers, or because these professionals had been eliminated in previous budget cuts. In New York City, each school now has a parent coordinator, required to have a college degree and two years of community experience, or a high school degree and six years of such experience. Their duties are primarily to encourage parent participation in their children's schooling, although they also may incidentally refer families to other agencies for assistance.⁴⁷

To provide the full range of services disadvantaged families need for their children to succeed, our model provides a professional comprehensive service coordinator (usually a social worker or public health professional), with knowledge of school and community resources as well as outreach and organization skills, and the ability to teach parent education classes. The model assumes that this comprehensive service coordinator is compensated comparably to the average teacher and has a caseload of 200 families. (In New York City, parent coordinators are paid comparably to paraprofessionals and are assigned one per school regardless of school size.⁴⁸)

The model assumes that these social work, health, and parent coordination services would begin for prekindergarten students. Costs would not be significantly affected if prekindergarten classes were physically located in or away from an elementary school. A comprehensive service coordinator can divide his or her time between facilities where the various students in his or her caseload of 200 are located.

The School Social Work Association of America recommends one school social worker for 400 students, but adds that “in situations where a large percentage of the school social worker’s caseload is comprised of students with heightened levels of needs or risk (e.g., physically challenged, developmentally delayed, economically disadvantaged students, or at-risk students), a significantly lower staff-to-student ratio is required in order for the school social worker to effectively deliver needed services.”⁴⁹ Because our model attempts to focus on economically disadvantaged students, and without further guidance from the School Social Work Association of America, we use a social worker to student ratio of 1:200.ⁿ

A source of inefficiency in the model is that school enrollments are not necessarily divisible by 200. In cases where they are so divisible, or approximately so, comprehensive service coordinators can divide their time. For example, two nearby schools, each with enrollments of 300, can share the services of three comprehensive service coordinators. This, however, is unlikely to be so neatly true in many cases, resulting in some comprehensive service coordinators having a student load of more or fewer than 200.

¹The role of school comprehensive service coordinators differs from that of family literacy coaches (in model years 5-7). In our model, literacy coaches attempt to improve parents' abilities to help their children with reading and to make the home environment conducive to literacy development, whereas school social workers/health/parent coordinators have a broader responsibility to both the parents and the school.

ⁿThe appropriate caseload does not only depend on problems parents experience at home and in their communities. It also depends on the extent to which comprehensive service coordinators are able to help schools create a culture that promotes positive adult interactions for student development and that decreases behavior and performance problems (Comer 2008).

As with literacy coaches for younger children, the per-student costs of comprehensive service coordinators would be less in cases where disadvantaged families have more than one child in grades K-12. The model makes no adjustment for this possibility.

Table 7 shows that the average annual per disadvantaged student cost of this comprehensive service coordinator for children ages 3 (beginning prekindergarten) to 18 is about \$500 annually for 15 years.

Table 7. Ages 3-18: School Comprehensive Service Coordinator	
Cost (\$2010, NYC)	
Compensation, School Comprehensive Service Coordinator	\$67,294
Compensation, Half-time Clerical Support	22,068
Supplies, Materials, Administrative Costs	6,959
Personnel Training and Education	2,873
Service Ratio (Student : Professional)	70%
Costs per Disadvantaged Child (\$2010, NYC), Annually for 15 Years	496

d) Three, Four, and Five Year Olds: Early Childhood Literacy Support

Outreach to parents, specifically home visits, remains important as children near the age of school entry. However, the nature of home visits changes for three year olds, as services of the nurse-family partnership are replaced with home visitors who emphasize literacy support for parents. Home visits in the model for three, four, and five year olds are modeled on the Home Instruction Program for Preschool Youngsters (HIPPPY). The HIPPPY program consists of biweekly home visits by trained paraprofessionals who have been recruited from the local community. During the visits, the paraprofessionals supply parents with educational books and toys, instruct parents in how to teach their children and how to make home environments conducive to learning, and assist both parents and children with the transition to kindergarten. Parents also attend group meetings every other week.⁵⁰

HIPPPY is cost effective as an early intervention program.⁵¹ After participating, parents spend more time reading to their children, more time talking to their children about books, and more time teaching them the alphabet. The parents also have greater knowledge about the way children develop and learn.⁵² Children of HIPPPY parents are more likely to perform at or above grade level on standardized vocabulary tests, to have higher grades, to have better classroom behavior, and to have lower levels of school suspensions than other children; these positive effects persist through the sixth grade.⁵³ Cost-benefit studies of HIPPPY estimate that the return to each dollar spent on HIPPPY is \$1.80.⁵⁴

For our model, we assume that these paraprofessionals, working half time, are paid comparably to K-12 teacher assistants. Teacher assistants typically have two-year degrees from a community college, but the BLS salary data for the New York City metropolitan area, used here, do not distinguish degreed from nondegreed teacher assistants. Each paraprofessional, or home visitor, has responsibility for literacy coaching with ten families. We assume that a program coordinator oversees six paraprofessionals, and this coordinator is compensated comparably to a regular elementary school teacher. We assume that each program coordinator has half-time clerical support.

The per child costs of this literacy support program, similar to HIPPPY, an annual cost of \$5,898 for each

of three years, are displayed in Table 8. These calculations assume that there is one eligible child per family. In cases where families have more than one child in this three-, four-, and five-year-old age group, costs would be lower, but the model makes no adjustment for this possibility.

Table 8. Early Childhood Literacy Support for Three, Four, and Five Year Olds		
Home Visitor Load (Families)		10
Home Visitor Load (Visits per Week)		6
Home Visitor Load (Group Meetings per Week)		0.5
	Number (per 60 Families)	Compensation (\$2010, NYC)
Home Visitor (Paraprofessional)	6	33,894
Program Coordinator	1	85,910
Clerical Support	0.5	44,135
Home Visits per Family		26
Group Meetings per Family		26
Costs per Child (\$2010, NYC)		
Personnel		5,189
Supplies, Materials, Administrative Costs		517
Personnel Training and Education		192
Total per Child (\$2010, NYC)		5,989

From Infancy to Age Five: High Quality Early Childhood Care and Education

Existing high quality early childhood care and education (ECCE) programs include both exemplary programs and large-scale publicly funded programs (i.e., Head Start). Although characteristics of high quality early childhood care and education programs vary, exemplary programs tend to be of even higher quality than high quality large-scale public programs. In general, exemplary programs employ more highly qualified staff, engage in closer supervision by child development experts, have higher staff-to-child ratios, and smaller group sizes than large-scale publicly funded programs. Consequently, exemplary programs are more expensive and produce more significant educational gains than large-scale publicly funded programs.

The model we estimate relies upon components with proven effectiveness in evaluations of exemplary programs. Early childhood experts frequently cite three exemplary programs: the High Scope/Perry Preschool Project, The Abecedarian Project, and the Chicago Child-Parent Centers (CPCs). Each of these has demonstrated both short- and long-term positive benefits. All three programs increase children's IQs for the years immediately following participation, result in fewer special education referrals, increase the likelihood of high school graduation and college attendance, and result in higher employment rates when participants reach their twenties. Two programs (Perry Preschool and Chicago CPCs) also reduce criminal behavior. The Abecedarian program and the Chicago CPCs enhance the quality of parent-child interactions, and improve parental involvement in education.⁵⁵

The three programs vary in intensity, curricula, and other programmatic details. However, all three share key components: Each targets disadvantaged children; begins serving children no later than age three; employs educated, well trained, and adequately compensated teachers; maintains high teacher-child ratios; and includes a parental outreach/home visitation component. Because there is strong evidence of the effectiveness of each program across multiple outcomes, our model employs these shared features as the chief characteristics of the early childhood care and education program.ⁿ

Evaluations of the three programs conclude that the intensity of service is crucial; high intensity programs, beginning in infancy and enrolling children in full-day and full-year programs, are the most effective.⁵⁶ Therefore, the model includes the cost of a full-day and full-year early childhood care and education program beginning for infants at six months of age.

Our model's early childhood care and education program follows the guidelines for high quality early childhood programs set forth by the National Institute of Child Health and Human Development and the National Association for the Education of Young Children (NAEYC).⁵⁷ The early childhood care and education program employs one qualified teacher with some postsecondary education (certification or a college degree in child development, early childhood care and education, or a related field) for every three children from the ages of six to 18 months, one similarly qualified teacher for every four children from the ages of 18 months to two years, one teacher for every seven two year olds, and one teacher for every eight children from the ages of three to five. NAEYC's standards also include a program director and administrative support staff person for every 60 children served.

The model also includes costs of administrative and support staff, overhead, supplies, transportation, food, and capital depreciation and interest. The model estimates that the average annual per child cost for five years of ECCE is \$18,576. Table 9 displays the detail underlying this result.

From Birth to 18 Years of Age: Routine and Preventive Pediatric Care

Low-income children have inadequate access to health services, inhibiting their healthy physical and cognitive development.⁵⁸ Although many children not presently insured will gain coverage when the federal insurance mandates become effective, insurance coverage alone will not address low-income children's lack of routine and preventive care. Poor children are less likely than nonpoor children to utilize health services even when coverage exists,⁵⁹ partly because of the absence of sufficient numbers of primary care physicians in low-income neighborhoods. Even where neighborhood providers are present, low-income parents typically are employed at hourly paid jobs where time off is not granted to take children to appointments for routine and preventive care. Low-income parents are less frequently available to spend time monitoring their children's general health and their health records, and low-income parents' own poorer physical or mental health renders them less able to monitor routine children's health needs.⁶⁰ A few measurable differences in children's health and in the health of their mothers (particularly, the frequency of depression) accounts for approximately 25% of the black-white achievement gap.⁶¹

Insured low-income children typically get treatment for emergencies or more serious illnesses at neighborhood clinics or emergency rooms, but not the routine and preventive care that middle class children generally receive. As a result, there are large disparities between low-, middle-, and high-income children in birth weight, immunization status, and the incidence of lead poisoning, asthma, anemia, ear infections, hearing loss, and stunted growth.⁶² The greater frequency of nonserious illnesses among low-income children results in greater absenteeism rates.⁶³ The school attendance gap alone explains part of the achievement gap.

ⁿ The model does not include the cost of parental outreach/home visitation as part of ECCE, because these costs have already been included in the NFP and HIPPPY model components.

There are also gaps between middle class and low income children in optometric and dental care. Again, the problem is not only insurance, but access to routine and preventive care. Children covered by Medicaid are almost twice as likely to have untreated dental decay as children with private insurance.⁶⁴

For these reasons, the model includes school-based clinics that provide routine and preventive pediatric, dental, and vision care in schools serving disadvantaged children from kindergarten through the 12th grade (i.e., ages 5-18, or years 7-19 of the model). School-based clinics can provide routine and preventive care without the necessity of parents taking time off from work. School-based clinics, working cooperatively with school comprehensive service coordinators, can also ensure that children are seen on a regular and recommended schedule for such care, without the necessity of parent initiative for appointments.

Because of the association of low student achievement with poor maternal health, the school-based clinics should also provide for routine and preventive care for parents, with referrals to other providers for nonroutine care. Healthier parents are better able to provide developmentally nurturing environments.

The model's school-based clinics also provide for routine and preventive care for young children before they enter school – that is, from birth to age five. In practice, providers of this medical care may be located away from schools and in communities, or parents may bring their young children to school clinics for routine and preventive care. If, in practice, routine and preventive care for infants and toddlers is provided at facilities away from the school site, the costing-out of such care is similar to the costing-out of care for older children, taking account of the fact that recommended intervals for routine care vary by age. Thus, the model provides routine and preventive care for all children from birth to 18 years of age in a single model component (school-based clinic), without necessarily implying a recommendation that very young children should, in practice, receive their routine and preventive care at local elementary or secondary schools.

School-based health clinics provide access for children at school sites to medical professionals who schedule routine visits with children (e.g., seven neonatal and infant visits, three visits for one year olds, biannual visits for children from ages two to ten, and annual visits for children from ages 11 to 17), conduct basic health screenings, ensure proper and timely immunizations, maintain children's health records, provide vision and hearing screenings, provide routine dental care, conduct mental health assessments, and make referrals to specialists when appropriate.

Empirical research on the link between school-based health clinics and academic achievement is limited. The methodological challenges facing many educational program evaluations, such as defining and measuring the treatment and outcomes, access to student level treatment and outcome data, and establishing clear treatment and control groups, plague the research on the effect of school-based health clinics on academic achievement.⁶⁵ Outcomes vary with treatment definitions (presence of a clinic, registration with a clinic, or frequency of clinic visits). If the measured treatment is presence of a clinic, outcomes could be more modest than if the treatment is frequency of visits.

Further, it is easier to measure the direct effects of school-based health clinics on behavior that may be achievement-related, than on the indirect effects on academic achievement itself. For example, a reduction in chronic illness-related absences due to routine and preventive services provided by a school-based clinic positively influences academic achievement by increasing the amount of time students are in class. Thus, the more rigorous research on the academic effects of school-based health clinics finds positive influences on attendance and tardiness.⁶⁶ Other positive indirect academic effects found in one or two studies are grade promotion,⁶⁷ lower dropout rates,⁶⁸ and higher educational aspirations and greater credit accumulation.⁶⁹ School-based clinics also positively affect health care utilization rates,⁷⁰ mental health and sexual behavior⁷¹— all factors that influence academic achievement. In sum, school-based health clinics have the potential to raise academic achievement for disadvantaged children, and thus narrow the achievement gap.⁷²

The model's school-based health clinics include site-based medical professionals (doctor, nurse practitio-

Table 9. From Six Months to Five Years Old: High Quality Early Childhood Care and Education

Compensation (\$2010, NYC)					
Teacher	84,073				
Program Director	105,284				
Clerical Support	44,135				
Child's Age	Six Months to One Year	One Year Olds	Two Year Olds	Three Year Olds	Four Year Olds
Children per Teacher	3	3.5	7	8	8
Costs per Child					
Personnel	30,515	26,511	14,501	12,999	12,999
Supplies, Materials, Administrative Cost	1,409	1,409	1,409	1,409	1,409
Personnel Training and Education	981	852	466	418	418
Total per Child (\$2010, NYC)	32,905	28,772	16,376	14,826	14,826
Average Annual Program Cost (5 Years): \$18,576					

ner, or physician's assistant; registered nurse; qualified mental health provider; dentist; dental hygienist; and optometrist who schedule routine visits with students at age appropriate intervals throughout the year, conduct basic health screenings, ensure proper and timely immunizations, and maintain children's health records.

Our model estimates the costs of some components in part by relying upon a report from the State of Oregon.⁷³ Oregon's School Based Health Centers Program has produced the most reliable, comprehensive cost study of school-based health clinics to date. However, some elements of our model of school-based health clinics are not included in Oregon's cost study, such as dental care and annual physical examinations for parents. Therefore, the model supplements the Oregon estimates to generate its cost estimate for a comprehensive school-based health clinic.

We include staff salaries and benefits; utilities; office, program and medical supplies; medication; information technology; staff training and education expenses; and start-up capital costs.^o Because personnel compensation comprises the biggest share of costs, we disaggregate by personnel type the comprehensive health services provided in the school-based health clinics.

Although the model does not generally include the costs of prescriptions resulting from diagnoses, there is one exception. The model includes the cost of corrective lenses prescribed in an optometric exam. Although there are no available data on the prevalence of visual impairment correctible by lenses for children under the age of 12, nationally about 9% of children aged 12-19 have such visual impairment. The rate is from two to three times greater for low-income children.⁷⁴ As an estimate of the disadvantaged child population from

^oThe model amortizes start-up costs over 30 years, with a 4% interest rate. Start-up costs include building renovation, furniture, electronic, office, and medical equipment, as well as an additional quarter time administrative staff member for the first two years and the development of a business plan. Because data on dental and optometric equipment cost were not available, these are not included.

age five to 17 with correctible visual impairment, we use 20%. Nationwide, children under the age of 18 with diagnosed correctible visual impairment spent an average of \$63 on glasses or contact lenses in 2006.⁷⁵ We have no information that would suggest how this figure should be adjusted for disadvantaged children, so we use it in the model.

The model's school-based health clinics provide year-round care to students and their parents. The frequency of visits with a primary pediatric care giver (physician, nurse practitioner, or the professional used in the model: physician's assistant [PA]) decreases as children mature. Based on recommendations of the American Academy of Pediatrics, the model provides for infant visits at ages of two weeks, four weeks, and two, four, six, nine and 12 months. The model provides for one year olds seeing a PA three times, at 15, 18 and 24 months. Children from the ages of two through ten should have biannual visits with the PA. Students from the ages of 11 to 18 and the parents of all children should have annual visits with a primary care professional.⁷⁶ A qualified mental health professional should be available to work with children and parents needing such services for weekly one hour sessions for three month increments. Based on an estimate of the Surgeon General, the model assumes that about one-fifth of children will be in need of mental health services over the course of a year.⁷⁷ It is probable that this ratio will be higher for the at-risk population for whom this model is intended, but we know of no data that would permit us to make a more precise estimate.

Beginning at age three, and continuing through age 17, the model provides for a routine biennial optometric exam.

The model provides for biannual dental visits, including dental hygiene treatment, for all disadvantaged parents and children, beginning for parents of infants and for children after their first birthday.

The model also includes the costs of a quarter-time director and three-quarters time clerical worker in each clinic – in other words, the model assumes that each clinic director can supervise four clinics, with the assistance of three clerical workers.

The model provides for a clinic director, a pediatrician, to coordinate the health professionals who provide the services. New York State law provides that a physician in a licensed clinic may supervise up to six physician assistants. In our model, in addition to supervising four physician assistants, the clinic director also coordinates other providers (dental, optometric, mental health) in the clinic. The clinic director also receives assistance from the school comprehensive service coordinator, described in the text explaining Table 7; this comprehensive service coordinator works with the clinic director to ensure that children are scheduled for routine visits and that those in need of follow-up care are referred to the appropriate providers and obtain the necessary care.

The space and equipment requirements of a clinic are unique; we cannot assume that existing school facilities can find such space without extensive renovation. Therefore, the model also includes an estimate of amortized capital costs for a clinic.

Because of varying needs at different points throughout children's development, the model estimates of the per child cost of a school based health clinic differ by year. As Table 10 shows, the average annual per-disadvantaged-child cost (including the cost of routine and preventive care for parents) of a clinic serving children throughout the 18-year development cycle following birth is about \$542. Table 10 displays this result.

Table 10. Birth to 18 Years of Age: Routine and Preventive Pediatric Care

Personnel		Compensation (\$2010, NYC)				
Physician's Assistant		112,685				
Nurse (LPN)		60,925				
Dentist		184,762				
Dental Hygienist		93,076				
Qualified Mental Health Professional		65,855				
Optometrist		143,073				
Clinic Director (Pediatrician)		193,020				
Administrative Support		46,296				
Child's Age	Neonatal and Infants	One Year Olds	Two Year Olds	Three to Ten Year Olds	Eleven to 17 Year Olds	
Per Child Costs						
Children						
Medical Care	297	127	85	85	42	
Mental Health				24	24	
Dental Care				112	112	
Optometric Care				9	9	
Parents						
Medical Care	42	42	42	42	42	
Mental Health	24	24	24	24	24	
Dental Care	112	112	112	112	112	
Optometric Care	9	9	9	9	9	
Administrative (Medical)	105	45	30	30	15	
Clinic Costs, per Child						
Personnel	590	360	302	447	389	
Supplies, Materials, Equipment, Bus, Operations, Admin. Costs	89	89	89	89	89	
Prescription Eyeglasses				16	16	
Personnel Training and Education	5	5	5	5	5	
Amortized Capital Expenditures	15	15	15	15	15	
Costs, per Disadvantaged Child (\$2010, NYC)	698	468	411	572	514	
Average Annual Program Cost (18 Years): \$542						

From Three to 18 Years of Age: High Quality Before- and After-School and Summer Programs

Children spend most of their time outside of school, making out-of-school programs an essential aspect of efforts to narrow the achievement gap. What happens outside of school has direct impact on school outcomes.

The positive adult-child interaction that occurs during after-school and summer programs is important not only for what it provides, but also for what it might prevent. Students without adult supervision in the after-school hours are at significantly greater risk for pregnancy, arrest, truancy, stress, poor grades, substance abuse, and other risk-taking behaviors. Students are most likely to become perpetrators or victims of crime in the first few hours after school; the juvenile crime rate triples between the hours of 3:00 and 6:00 p.m.⁷⁸ Out-of-school programs promote avoidance of these risks.⁷⁹

Children whose out-of-school time includes 20-30 hours each week of constructive learning activities, such as discussions with knowledgeable adults or peers, reading, writing, and problem solving games, do better in school than those whose out-of-school time does not include such activities.⁸⁰

Low-income children are less likely to have access to quality after-school and summer programs.⁸¹ Their parents, having less time, money, and education, are less able to extend their children's learning outside of school. Less-educated parents are less able to help their children with homework; the achievement gap may be sustained or widened because schools have assigned increasing amounts of homework in recent decades.⁸²

While many children may experience some summer learning loss, the loss is more severe for low-income children than for middle- and high-income children.⁸³ Specifically, the reading skills of very young low-income children remain stagnant during the summer, perhaps because they are less likely to be read to by adults during the summer than are children from high-income families.⁸⁴ Families in low-income communities have less access to public libraries and to retail stores selling books for children.⁸⁵ During the summer, math skills of low-income children also decline.⁸⁶ As middle- and high-income children do not experience summer skills stagnation or declines similar to those experienced by low-income children, the achievement gap widens during the summer months.⁸⁷ "About two-thirds of the total [achievement gap between high SES and low SES children] traces to summer learning differences over the elementary years. The low SES group actually gains a bit more during the corresponding school years than does the high group (5.2 points, not a significant difference), but this favorable showing while in school is more than offset by their summer shortfall!"⁸⁸

Because participation in after-school and summer programs is usually voluntary (except where academic remediation is required for grade promotion in some grades and in some school districts), rigorous empirical evaluations of these programs' effectiveness are limited.⁸⁹ However, a comparison of low-income students attending structured after-school programs, with similar students having other types of after-school care (maternal care, self-care, informal adult supervision), finds that students attending structured after-school programs perform better in math, reading, and other subjects and receive better conduct ratings than students with more informal after-school arrangements.⁹⁰ Children attending high-quality after school programs perform better than peers on social and emotional adjustment, school conduct, grades, attendance, homework completion, achievement test scores, peer relations, and other measures.⁹¹ There are similar positive links between student outcomes and participation in youth development activities sponsored by organizations other than schools.⁹²

These many research findings have recently been summarized not only by Heather Weiss and colleagues in their review for the Center on Education Policy, but in reviews by Beth Miller for the Nellie Mae Education Foundation.⁹³

There are insignificant cost implications for locating after-school and/or summer programs at school sites or at separate facilities. Our model assumes that these programs would be located at school sites,

but it is not necessary that this be the case. An advantage of school-based after-school and summer programs is the potential to foster continuity between school and out-of-school time. After-school and summer programs can ensure a focus of time and resources on academic activities that are aligned with school curricula and goals, and that are responsive to student need in relation to those goals.⁹⁴ But a danger of school-based programs is that they may become too heavily focused on academic remediation or extended academic time, and give insufficient attention to developing the organizational, athletic, and cultural traits that middle-class students typically develop in the after-school hours. After-school and summer programs should provide activities that are not simple reiterations of school-day activities, but instead offer students the opportunity to choose from a variety of enrichment and recreational opportunities not typically available during the school day.⁹⁵ Program staff should possess an adequate level of literacy to help children with learning and be diverse enough in their own interests and talents to develop and lead students in enrichment and recreational activities.⁹⁶ High-quality programs should have access to facilities and other resources necessary to offer this wide array of activities.⁹⁷

High-quality school-based programs generally employ one staff member for every 10-15 students, with a site coordinator, or program director, to oversee the operations of the program and work with the school principal to coordinate school and program goals and activities.⁹⁸ High-quality after school and summer programs may be in operation for as many if not more hours as regular school, have professional or paraprofessional staff as large as those of regular school, and have activities and curricula as diverse as those of regular school. Our model, therefore, assumes that site coordinators would have qualifications similar to those of school administrators (principals and assistant principals).

One-on-one tutoring should be part of an after-school or summer program.⁹⁹ It can increase reading achievement and other academic outcomes in the early grades, most notably when it employs certified teachers as tutors.¹⁰⁰ Therefore, our model includes the cost of one hour per student per week of one-on-one time with a qualified academic tutor. The model assumes that this tutor would be a paraprofessional, with a two-year degree, with qualifications and compensation similar to the visiting home literacy coaches described in Table 8 for three, four, and five year olds.^p The model also provides supervision of tutors by regular teachers, in a 1:10 teacher-to-tutor ratio, who diagnose learning deficits, choose materials, design tutoring curriculum, and otherwise guide the tutors.

One to two hours a week of tutoring has beneficial effects, but research demonstrating these effects has concerned pull-out tutoring during the regular school day, not after-school or summer tutoring.¹⁰¹ Many middle class children get more than one hour a week of after school academic support (such as help with homework) from educated parents. The tutoring supplied under No Child Left Behind's "supplemental education services" component (usually delivered in small groups, not to individuals) can often approximate an average of one hour per week per student outside the regular school day. Yet some highly regarded after school programs today offer less individual tutoring. The After School Corporation's model program prescribes one certified teacher or teacher's aide for 90 minutes, three days per week, for 30 children, or an average of 15 minutes per week of tutoring per child.¹⁰² In the absence of definitive research, our model's one hour of tutoring per week per child seems to be a reasonable minimum.

Some cost estimates in our after-school model rely upon data from the Boston-based organization, Parents United for Child Care, which convened a working group of parents, public school educators, out-of-school time providers, and representatives from health care, juvenile justice, business, child welfare, mental health and local, state, and federal government agencies, to develop and cost-out a year-round, out-of-school program.¹⁰³ The model program operates for four hours after school for 5-13 year olds, for five

^p BLS data do not distinguish between the compensation of paraprofessionals (teacher assistants) with two-year post-secondary degrees and those who have only high school degrees or less. Consequently, our estimate of compensation for teacher assistants with a post-secondary degree may be understated, because we use the BLS figure for all teacher assistants.

Table 11. Five to 17 Years of Age: Before- and After-School and Summer Programs

Personnel	Compensation (\$2010, NYC)
Site and Assistant Site Coordinators (Average)	135,560
One-on-One Tutors	33,894
Tutoring Supervisor	84,073
Enrichment Teachers (Paraprofessionals)	33,894
Enrichment Supervisor	84,073
Clerical Support	44,135
Per Student Personnel Costs	
Site Coordination (Program Directors)	271
One-on-One Tutors	802
Tutoring Supervision	199
Enrichment Teachers	2,712
Enrichment Supervision	673
Clerical Support	153
Before, After School, and Summer Program per Student Costs	
Personnel	4,745
Supplies, Materials, Administrative Costs	1,087
Rent, Utilities, Maintenance	449
Personnel Training and Education	153
Total per Student (\$2010, NYC), Annually for 13 Years	6,434

hours after school for 14-17 year olds, and for five hours on Saturdays for all school-age children for the 38 weeks of the school year. For the other 14 weeks of the year, holidays and school vacations, the program operates for ten hours a day. The program employs one adult direct care staff member for every ten children. We adopt these guidelines, with the assumption that, in addition to the tutoring program described above, a fully trained teacher would supervise ten paraprofessionals who, in turn, would guide cultural, organizational, athletic, academic, and other enrichment activities.

The survey of after school programs conducted by Public/Private Ventures and by The Finance Project found that “quality” programs for elementary and middle school students operate for an average of 3.7 hours per day during 181 days of the school year and operate for teenagers for 3.8 hours a day during 150 days of the school year. The survey found that for elementary and middle school students these programs operate for an average of 8.7 hours during 44 days in the summer and operate for teenagers for 6.4 hours a day during 35 days in the summer.¹⁰⁴ These are averages of the programs surveyed, so the highest quality programs operated for somewhat longer hours than the average, perhaps closer to the hours described in the Boston-based Parents United model.

Based in part on advice of a task force convened by the Campaign for Educational Equity to consider an earlier draft of this report, the model of this report costs-out programs that operate for elementary, middle, and high school students for four hours per day, six days per week during 38 weeks of the school year, and for eight hours per day, six days per week, during ten weeks of the summer.

The model assumes a school-based after school and summer program, located in elementary and middle schools with enrollment of 500, and in high schools with enrollment of 1,000. The model's cost estimates include compensation for site coordinators and administrative staff, food, educational and administrative supplies, transportation for field trips, occupancy costs, liability insurance, other administrative costs and rental equivalence.⁹ As Table 11 shows, the model estimates that the average annual cost for 13 years of providing such an after-school and summer program is about \$6,434 per student.

Summary

Table 12a summarizes the results. For disadvantaged students, an average annual expenditure of about \$15,905 for each year of the 18½-year development cycle is the most efficient way of permitting their acquisition of skill to build upon prior skill. For those coming from families with incomes of less than 185% but more than 75% of the federal poverty line, such expenditure should give young people a meaningful opportunity to significantly narrow the achievement gap with middle class students.

Table 12a summarizes data in previous tables, all of which were expressed in estimated New York City costs for 2010.

Taking into account differences in the purchasing power of the educational dollar between New York City and New York State overall, we also provide an estimate of these per-pupil costs, on average for New York State. This estimate is displayed in Table 12b. It shows that for disadvantaged students, an average annual expenditure of about \$14,030 for each year of the 18½-year development cycle is the most efficient way of permitting their acquisition of skill to build upon prior skill.

As a very rough estimate, if these services were provided nationwide, by applying the interstate and intrastate cost adjustments used elsewhere in the report, the average annual cost for 18½ years in current national dollars would be approximately \$12,504.

Table 13 summarizes the costs to the New York State budget of providing these services over the full 18½-year cycle. In \$2010 (NYS), for a mother and child who had completed the full 18½-year development cycle and received appropriate services in each year, the total lifetime per child cost would be approximately \$260,000.

For appropriate services for all children (i.e., pregnant women) statewide in the six months, when prenatal services only to the first cohort are provided during the second and third trimesters of pregnancy, the total budgetary cost is \$0.8 billion. Once the full 18½-year cycle has been completed, the annual New York State budgetary cost for serving all cohorts simultaneously would be \$21.4 billion. Again, keep in mind that these are total costs, not net new costs, which would be considerably less.

The bottom row of Table 13 displays the total budgetary costs of the model for New York State if services are provided only to 75% of eligible children. Here, the first-cohort total budgetary cost is \$0.6 billion, and once the full 18½-year cycle has been completed, the annual total New York State budgetary cost for serving all cohorts simultaneously would be \$16.1 billion. Again, these are total costs, not net new costs.

⁹ The model's estimate for the per child cost of site administration, assuming site enrollment of 500 at the elementary and middle school level and 1,000 at the high school level is not consistent with the model's assumption of site size for clinics. For the estimate of the per child cost of administration of routine and preventive pediatric, dental, and optometric care, the model uses the average clinic enrollment from Nystrom and Matthews (2007) of 858. The differing site sizes, although not consistent, are close enough for our purposes. Other than site administration for health clinics and after-school and summer programs, no other costs in the model are dependent on the enrollment size of the unit through which services are delivered.

Table 12a. Summary: Model Costs per Child, by Year (\$2010, NYC)

Year of Developmental Cycle

Age of Child	Prenatal	0-1	1-2	2-3	3-4	4-5	5-6	6-7	7-8	8-9	9-10	10-11	11-12	12-13	13-14	14-15	15-16	16-17	17-18
Grade of Child		ECCE	ECCE	ECCE	Pre-K	Pre-K	K	1	2	3	4	5	6	7	8	9	10	11	12
Model Years	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19

Program Costs per Child (\$NYC, 2010)

Prenatal Care	17,020																		
Family Support																			
Nurse Family Partnership	5,189	10,157	7,425	4,203															
Parent Education		1,264	1,264	1,264	1,264	1,264	1,264	1,264	1,264	1,264	1,264	1,264	1,264	1,264	1,264	1,264	1,264	1,264	1,264
Comprehensive Service Coordinator					331	331	331	331	331	331	331	331	331	331	331	331	331	331	331
Literacy Support					5,898	5,898	5,898												
Early Childhood Care and Education		32,905	28,772	16,376	14,826	14,826													
Health Care (School Clinic)		698	468	411	572	572	572	572	572	572	572	572	514	514	514	514	514	514	514
Before, After, and Summer School Programs							6,434	6,434	6,434	6,434	6,434	6,434	6,434	6,434	6,434	6,434	6,434	6,434	6,434
Total Model Costs by Year (\$NYC, 2010)	22,210	45,024	37,930	22,253	22,890	22,890	14,498	8,600	8,600	8,600	8,600	8,600	8,543	8,543	8,543	8,543	8,543	8,543	8,543

Average Annual Cost for 18½ Years (\$NYC, 2010): \$15,702

Table 12b. Summary: Model Costs per Child, by Year (\$2010, NYS)

Year of Developmental Cycle

Age of Child	Prenatal	0-1	1-2	2-3	3-4	4-5	5-6	6-7	7-8	8-9	9-10	10-11	11-12	12-13	13-14	14-15	15-16	16-17	17-18
Grade of Child		ECCE	ECCE	ECCE	Pre-K	Pre-K	K	1	2	3	4	5	6	7	8	9	10	11	12
Model Years	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19

Program Costs per Child (\$NYS, 2010)

Prenatal Care	15,014																		
Family Support																			
Nurse Family Partnership	4,578	8,960	6,550	3,707															
Parent Education		1,115	1,115	1,115	1,115	1,115	1,115	1,115	1,115	1,115	1,115	1,115	1,115	1,115	1,115	1,115	1,115	1,115	1,115
Comprehensive Service Coordinator					292	292	292	292	292	292	292	292	292	292	292	292	292	292	292
Literacy Support					5,203	5,203	5,203												
Early Childhood Care and Education		29,026	25,381	14,445	13,078	13,078													
Health Care (School Clinic)		616	413	362	504	504	504	504	504	504	504	504	454	454	454	454	454	454	454
After School and Summer Program							5,675	5,675	5,675	5,675	5,675	5,675	5,675	5,675	5,675	5,675	5,675	5,675	5,675
Total Model Costs by Year (\$NYS, 2010)	19,592	39,717	33,459	19,630	20,192	20,192	12,789	7,586	7,586	7,586	7,586	7,586	7,536	7,536	7,536	7,536	7,536	7,536	7,536

Average Annual Cost for 18½ Years (\$NYS, 2010): \$13,851

Table 13. Summary: Cumulative Model Costs per Child, and Total

Services for Children from Families with Incomes of Less than 185% of the Federal Poverty Line

Age of Child	Prenatal	0-1	1-2	2-3	3-4	4-5	5-6	6-7	7-8	8-9	9-10	10-11	11-12	12-13	13-14	14-15	15-16	16-17	17-18
Grade of Child		ECCE	ECCE	ECCE	Pre-K	Pre-K	K	1	2	3	4	5	6	7	8	9	10	11	12
Model Years	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Per Child (NYC)	22,210	67,233	105,163	127,417	150,307	173,197	187,695	196,295	204,895	213,496	222,096	230,696	239,238	247,781	256,323	264,866	273,408	281,951	290,493
Per Child (NYS)	19,592	59,308	92,767	112,397	132,589	152,782	165,571	173,157	180,743	188,330	195,916	203,502	211,038	218,573	226,109	233,645	241,180	248,716	256,251
Total (NYS) (\$Billions), 100% Participation	0.8	5.0	7.7	9.4	11.1	12.8	13.8	14.5	15.1	15.7	16.4	17.0	17.6	18.3	18.9	19.5	20.1	20.8	21.4
Total (NYS) (\$Billions), 75% Participation	0.6	3.7	5.8	7.0	8.3	9.6	10.4	10.8	11.3	11.8	12.3	12.7	13.2	13.7	14.2	14.6	15.1	15.6	16.1

Appendix A. Will Implementation of This Model Reduce Special Education Expenditures?¹

This report states that “children born to low-income mothers have lower birth weight as well as more lead poisoning and iron deficiency anemia, each of which leads to diminished cognitive ability, behavioral problems and more special education placement.” We project that the implementation of this report’s model for early childhood, family support, and health programs for disadvantaged children could reduce special education costs “as children with healthy experiences in the prenatal months and in neonatal, infancy and early childhood have fewer developmental, behavioral and cognitive disabilities.” This report notes that programs such as the High Scope/Perry Preschool Project, The Abecedarian Project, and the Chicago Child-Parent Centers (CPCs) “increase children’s IQs for the years immediately following participation, and result in fewer special education referrals.”

Important factors predicting the disparity by income in the proportion of students identified with a disability are likely differential family and home environments and differential access to quality healthcare. Middle- and high-income families are better able to provide their children with the resources necessary to avoid being identified with a disability. It is these resources that the 18½-year developmental cycle proposal provides to children living at and around the poverty level. With these resources, it is probable that the disparity in identification of disabilities between low- and middle-income children would shrink. The identification of fewer low-income children with disabilities will result in lower costs to educate these children, because many supplemental services will no longer be necessary.

This appendix provides a very rough “back-of-the-envelope” estimate of the savings from such reductions in special education costs that result from implementation of the 18½-year program described in the main report. We estimate that New York State would save approximately \$200 million annually in special education costs that would be avoided if the 18½-year program were implemented.

We arrive at this estimate in two ways. Precise data are not available, so in each case, very rough approximations were used.

First, we estimate the savings that would accrue if the special education identification rates of low-income children could be reduced to the rates of middle class children. For these purposes, we consider low-income children to be those from families with 2009 incomes of from \$20,000 to \$35,000, and middle class children to be those from families with 2009 incomes of from \$68,000 to \$100,000.

If the special education identification rates of low-income children in New York State could be reduced to the rates of middle class children, we estimate savings of \$199 million. Of this, approximately \$33 million would be saved in federal special education funds for New York State, and \$166 million would be saved in state-funded costs.

Second, we estimate the savings that would accrue if the special education identification rates of African American children could be reduced to the rates of white children. We estimate that these savings would total \$262 million, of which \$44 million would be saved in federal funds and \$218 million from state funds.

That both of these estimates are comparable gives us confidence that the estimate is of the correct order of magnitude. It is not possible to be more precise.

¹We are grateful to University of Wisconsin graduate student Rachel Fish for assistance in preparing this appendix.

Estimates Using Family Income Data

In 2005, the U.S. Department of Education published 2001 national special education identification rates by family income. Table A1 summarizes these data.

Table A1. Percentage of Children with Disabilities in Families by Income, 2001		
	Families with Income of	Ages 6-17
a	\$15,000 or less	15.2%
b	\$15,001 to \$25,000	14.4%
c	\$25,001 to \$50,000	12.2%
d	\$50,001 to \$75,000	10.8%
e	\$75,001 or more	6.6%
f	All Families	11.4%

Source: Authors' calculations from OSEP 2005, Figures 1-23 and 1-24.

Similar data have not since been published. There is no precise way to convert this to New York State 2009 dollars; for an approximation, we adjusted for inflation, using the Consumer Price Index for All Urban Consumers (all items), and adjusted for regional cost differences using the Comparable Wage Index by state.¹⁰⁵ And, of course, this adjustment cannot account for any changes in special education identification rates since 2001.

Table A2 displays the results, after making the adjustments described above.

Table A2. Percentage of Children with Disabilities in Families by Income, 2009, New York State (Estimated)		
	Families with Income of	Ages 6-17
a	\$20,000 or less	15.2%
b	\$20,001 to \$35,000	14.4%
c	\$35,001 to \$68,000	12.2%
d	\$68,001 to \$101,000	10.8%
e	\$101,001 or more	6.6%
f	All Families	11.4%

Source: Authors' calculations from OSEP 2005, Figures 1-23 and 1-24.

In 2009/2010, the federal poverty level for a family unit of four is \$22,050. This is slightly higher than the category *a-b* dividing line of \$20,000 in New York State purchasing power, or approximately \$17,825 in national purchasing power. In national dollars, category *b* includes family units of four with incomes of from 81% of poverty to 141% of poverty, a group we would roughly identify as “low income.” Category *c* includes family units of four with incomes of from 141% of poverty to 275% of poverty, and category *d* includes family units of four with incomes of from 275% of poverty to 408% of poverty. We have no data that reports, and we have not attempted to estimate a special education identification rate for categories *c* and *d* combined, a group we would roughly identify as “middle class.”

We estimated the number of children in New York State in 2009 in families in each of the adjusted income categories reported in Table A2, using data from the U.S. Census Bureau’s American Community Survey.¹⁰⁶ This procedure is also very approximate, because the income categories in the ACS do not correspond exactly to those in the inflation- and region-adjusted Table A2, and because the ACS provides data only on families in each income category, not on children in families in each income category. Inasmuch as family size can vary by income category, our method provides only an approximate estimate in this respect as well.

A recent census report surveyed state and federal revenues for special education. In 2008, New York State spent approximately \$3.3 billion of its own funds, and \$700 million in federal funds on special education.¹⁰⁷ We made no effort to adjust this for a more recent year, because special education spending variation is likely to be affected as much by policy variation as by inflation. By dividing these numbers by the ACS 2009 estimate of the number of 6-17 year olds in New York State, and then multiplying by the percentage of children in special education in category *f* of Table A2, we estimated that the average per pupil special education cost in New York State is approximately \$9,400. This calculation also is very rough, because some special education funds are spent on children under the age of six and from the ages of 18-21.

Finally, we applied the special education identification percentage for middle class children in category *d* of Table A2 to the estimated number of low-income children in the category *b* of Table A2, to calculate what special education expenditures on this category of low-income children would be if their identification rates were similar to those of middle class children. The difference between this number and the actual expenditures on special education for children in the category *b* is the estimate of \$199 million in savings. These savings would be reduced somewhat if we used a “lower middle class” category such as *c* instead of the more typically middle class category *d*.

We presume that there would also be savings from a reduction of special education identifications as a result of reduced identifications for children in the category *a* of Table A2. Perhaps it would be reasonable to expect that the savings from implementation of the model would result from children in income category *a* now having special identification rates similar to those in category *b*. This amount, not estimated, should be added to the \$199 million estimate.

Estimates Using Race and Ethnic Data

We also estimate the savings from a reduction in special education expenditures that would be realized if the identification rates of African-American children could be reduced to those of white children. Again, this is a very rough way of estimating the order of magnitude of savings from implementation of the 18½-year program. There is overlap between the categories of black vs. white, and the categories of low income vs. middle class, but not nearly enough to make this a reliable estimate.

An examination of Table A3 shows that the categories in which black identifications are much greater than white identifications are mental retardation (black to white ratio of 2.6), emotional disturbance (2.1) and

Table A3. Disability Type by Race/Ethnicity for Children Age 6-21, 2007

	Mental Retardation	Hearing Impairments	Speech or Language Impairments	Visual Impairments	Emotional Disturbance	Orthopedic Impairments	Other Health Impairments	Specific Learning Disabilities	Deaf-Blindness	Multiple Disabilities	Autism	Traumatic Brain Injury	Developmental Delay	Total
American Indian or Alaska Native	1.01%	.14%	2.49%	0.05%	1.11%	0.10%	1.26%	7.09%	0.00%	0.26%	0.30%	0.06%	0.51%	14.38%
Asian or Pacific Islander	0.39%	0.13%	1.34	0.04%	0.18%	0.08%	0.34%	1.60%	0.00%	0.13%	0.51%	0.02%	0.09%	4.85%
Black, Non-Hispanic	1.56%	0.12%	1.76%	0.04%	1.27%	0.09%	1.12%	5.32%	0.00%	0.28%	0.36%	0.04%	0.20%	12.15%
Hispanic	0.59%	0.13%	1.67%	0.04%	0.41%	0.11%	0.52%	4.55%	0.00%	0.14%	0.25%	0.03%	0.07%	8.51%
White, Non-Hispanic	0.60%	0.10%	1.74%	0.04%	0.62%	0.09%	1.07%	3.42%	0.00%	0.20%	0.43%	0.04%	0.13%	8.47%
Total	0.74%	0.11%	1.72%	0.04%	0.66%	0.09%	0.94%	3.88%	0.00%	0.20%	0.39%	0.04%	0.13%	8.93%
Ratio, Black to White Rate	2.6	1.2	1.0	1.2	2.1	1.0	1.0	1.6	0.8	1.4	0.9	1.0	1.5	1.4

Source: OSEP 2008

Table A4. Disability Type by Race/Ethnicity for Children Age 6-21, 2007

	Mental Retardation	Hearing Impairments	Speech or Language Impairments	Visual Impairments	Emotional Disturbance	Orthopedic Impairments	Other Health Impairments	Specific Learning Disabilities	Deaf-Blindness	Multiple Disabilities	Autism	Traumatic Brain Injury	Developmental Delay	Total
Ratio, Black to White Rate	2.6	1.2	1.0	1.2	2.1	1.0	1.0	1.6	0.8	1.4	0.9	1.0	1.5	1.4
Marginal Cost (\$2001, US)	\$848	\$9,436	\$4,402	\$12,255	\$7,591	\$8,437	\$6,673	\$4,002	n/a	\$13,539	\$12,234	\$9,986	n/a	\$5,969

Source: Chambers et al., 2003

specific learning disabilities (1.6). These are the categories of disability that we would most likely expect to decline if the full services modeled in the main report were provided.

Using a similar methodology to that described above for special education identifications by family income groups, we estimate the savings to New York State if the overall rates of special identification for black children (now 12.15%) could be reduced to the rate for white children (now 8.47%). We estimate these savings to be about \$262 million, of which \$44 million would be saved in federal funds and \$218 million from state funds.

Both the family income-based estimate of savings and the race-based estimate of savings rely upon an assumption that the marginal cost of all special education identifications can be applied to these reduced rates of identification for low-income and minority students.

Table A4 summarizes the marginal costs of special education placements, by disability, along with the ratios of black to white special education identifications displayed in Table A3. These marginal cost data from 2001 are the most recent available.

This table shows that the category from which the most savings can be realized, specific learning disabilities, with 5.3% of all black children so identified (from Table A3), had slightly lower marginal costs in 2001 (\$4,002) than the average marginal cost (\$5,969). But the other categories in which the black-white identification ratios are greatest, mental retardation and emotional disturbance, are more costly, though less prevalent. Although we cannot assume that these considerations will offset each other precisely, these data do give us yet further confidence that our order-of-magnitude estimates of savings are reasonable.

Appendix B. Are Services Provided in This Model Already Covered by Medicaid?

As noted in the main report, our model's ingredients-based estimate of the per-child cost of a school-based health clinic is similar to that of the Children's Aid Society (CAS), which estimates a cost (in \$2009) of \$498 for a clinic in an elementary school, \$560 for a clinic in a middle school, and \$640 for a clinic in a high school; a weighted (by grade levels) average of \$550 in New York City dollars for 2009. Making an adjustment for \$2010 (NYC), the Children's Aid Society weighted estimate would be about \$556

Unlike this report's estimate, the CAS estimate does not include capital expenditures for facilities. The services provided in CAS clinics also differ from those in this report's model. This report's model includes substantial health services for parents, and for infants and toddlers, not included in the CAS clinics. Approximately half of the costs of the school-based health clinics in this report's model are attributable to parents and another 5% are attributable to infants and toddlers. The CAS clinics include substantial health education services for adolescents and teens, as well as reproductive health services for sexually active youth, not included in this report's model, in part because we consider that health education programs should be part of the regular school curriculum, not separately provided by health clinic staff.

The costs of a school-based health clinic in this report's model seem to be fully reimbursable by Medicaid. Indeed, because school-based health clinics provide health services more efficiently and less expensively than private providers, Medicaid reimbursement rates exceed the costs of providing these services in a school-based clinic by nearly 30%.

We developed this estimate by calculating the specific billable services modeled in this report's school-based health clinic at current national average Medicaid reimbursement rates.⁹ For example, the model provides that children should receive biennial routine and preventive physical examinations. Medicaid's existing national average reimbursement rate for a 30-minute office visit for a "new patient, low complexity"¹⁰⁸ was \$62.59 for 2008. Medicaid's existing national average reimbursement rate for a 25-minute office visit for an "established patient, moderate complexity"¹⁰⁹ was \$56.12 in 2008. Calculations assume that a child is a "new patient" in infancy and then again at the beginning of elementary school, middle, and high school.¹¹⁰

Using such assumptions, we estimate that Medicaid reimbursements total approximately \$700 (in \$2008) for the services provided in the model for children and their parents, sufficient to cover the services in the model.

There are, however, practical considerations that deviate from this ideal. Medicaid may require service to be rendered by physicians in preferred provider organizations; in others, services must be provided by designated providers.¹¹¹ In such cases, Medicaid may not accept billings from school-based health clinics, although in many cases there are avenues for qualifying. Another consideration is that although this report's model is designed for children from families with incomes below 185% of the poverty line, not all children from such families are enrolled in Medicaid. Immigrant children, for example, are not eligible for Medicaid. Although they are eligible for S-CHIP insurance coverage, S-CHIP does not presently accept billing from school based-health clinics. It is unclear how this will work under the new national health care regulations. Similarly, some children of low-income workers are covered by private insurance from their parents' employers, yet private insurance companies may not accept billing from school-based health clinics.¹¹² Therefore, although Medicaid reimbursements may exceed the cost of providing services for Medicaid-eligible children, the excess reimbursements may not fully cover the cost of providing services for children not enrolled in Medicaid.

⁹ Detailed calculations are available from the Campaign for Educational Equity at Teachers College.

In New York, additional public funds are available to cover the costs of school-based health clinics under the state's Child Health Plus program. Some states use tobacco settlement money for this purpose. Others have specific appropriations for school-based health clinics, over and above Medicaid reimbursements.

Another method for estimating Medicaid reimbursements to school-based health clinics is less precise, but nonetheless instructive. In FY2006, the average national Medicaid cost for children was \$2,279, and for adults, \$3,346.¹¹³ In this report's model, approximately half of the costs of a school-based health clinic are attributable to services for children, and the other half for parents, so this estimate, adjusted for the child population of this report's model, should be about \$2,800. Adjusted for medical care inflation, the number is approximately \$3,100 in \$2010, national. This number, however, includes not only the routine and preventive care modeled in this report, but also treatment for serious illness, emergency room visits, hospitalizations, and so on.

Dimon (2009) estimates that Medicaid reimbursements for other-than routine and preventive care average \$1,000 per child. If this estimate is valid, Medicaid reimbursements to school-based health clinics could average \$2,100 (\$2010, national) for the children's portion, or approximately five times as much as our ingredients-based estimate of the school-based health clinics' cost of providing services to children (approximately half of the \$570 (\$2010, NYC) annual cost of providing services to children and their parents). This seems like much too high a multiple, and we can only speculate as to why – perhaps, for example, the \$1,000 estimate for other-than routine care is too low. But in any event, it seems likely that Medicaid reimbursements are sufficient to cover school-based health clinic services.

Other programs specified in this report's model, besides the school-based health clinic, may also have elements that are Medicaid reimbursable. These include obstetric services provided for pregnant women in the first year of the cycle, and services provided for infants and children to their fourth birthday in the Nurse-Family Partnership program. These expenditures could partly support the Dimon estimate.

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110. National average Medicaid reimbursement rates for Table 1 are from Zuckerman, Williams, and Stockley (2009a), Appendix Table 1, except for reimbursement for dental services, which come from Zuckerman, Williams, and Stockley (2009b), Table 8.
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112. Telephone conference with Katherine Eckstein and Beverly Colon of the Children's Aid Society, November 3, 2009.
113. Smith, 2008, Appendix Table 1.

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