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# Early Childhood Health Problems and Prevention Strategies: Costs and Benefits

Studies Show Lasting Societal Benefits from Investments in the Health of Young Children



*Do investments in children's health programs reap benefits beyond the costs? In this paper, Dr. Bernard Guyer and his colleagues at Johns Hopkins University examine the costs of four specific types of young children's health problems—exposure to tobacco smoke, unintentional injury, mental health problems, and obesity—and review over 300 studies of a range of interventions to address them. While results vary for each health issue, the bottom line is that investing in early childhood health makes economic sense.*

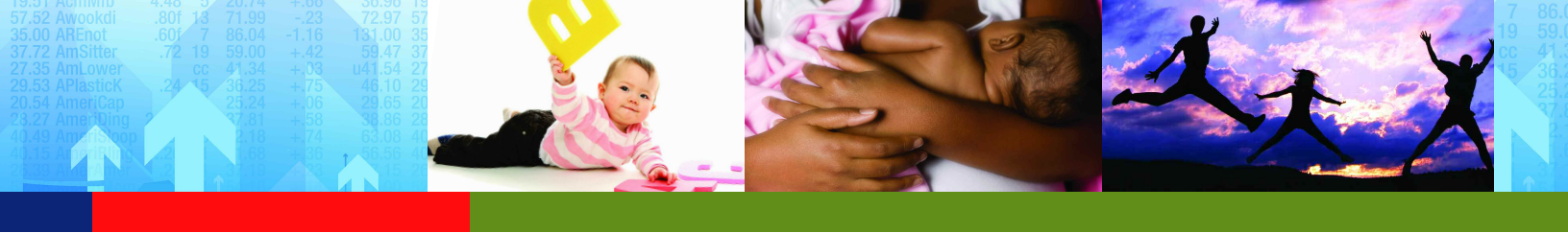
According to the authors, our society has failed to take an investment approach to the health of young children, despite the logic of doing so and despite the evidence available that these investments are beneficial. Exposure to tobacco smoke, unintentional injury, mental health problems, and obesity represent serious threats to young children's health. Additionally, all of them—if not prevented or addressed early in children's lives—can have lifelong consequences.

Based on an extensive review of studies on these four health issues, this report lays out the costs to society of *not* treating these conditions and assesses the economic benefit to society of doing so. While the precise net benefits of treatments are often uncertain, many are clearly cost-effective.

## Treatable Health Problems Affect Many U.S. Children\*

- One in seven preschool children is obese—nearly triple the rate of just three decades ago
- As many as one in five has mental health problems that cause at least mild functional impairment
- Nearly half a million children are born each year to a mother who smoked during pregnancy, and up to 50% of children are exposed to tobacco smoke in the home
- Each year, one child in six suffers a serious unintentional injury

\* Data are from the most recent year available.



## Exposure to Tobacco Smoke:

**“There is considerable evidence that many anti-tobacco interventions are effective, can improve child health, and save health care dollars.”**

Despite the substantial evidence of the harm it causes, nearly half a million U.S. children are born each year to mothers who smoked while pregnant, and 25-50% of all children are exposed by household members to environmental tobacco smoke (ETS). Prenatal exposure is associated with increased odds of a variety of illnesses—premature delivery, low birth-weight, and sudden infant death syndrome (SIDS) among them—as well as attention deficit hyperactivity disorder in childhood. Low birth-weight, in particular, has been linked to delays in children’s later development and progress in school. Further, exposure to ETS is linked to various respiratory ailments, including asthma, allergies, and acute lung and ear infections.

These are expensive problems. The extra costs for prenatal care and complicated births among women who smoke during pregnancy are more than \$4 billion a year.<sup>1</sup> Care for childhood illnesses resulting from exposure to tobacco smoke costs nearly \$8 billion a year. As a result, reducing parental smoking can produce substantial economic benefits for society. One study estimates that if smoking prevalence dropped among pregnant women by just 1%, the nation would save \$21 million in direct medical costs the first year alone. If it continued to drop by 1% each year, we would save \$572 million in these direct costs over seven years. Another report estimates that, given the high costs associated with childhood ETS exposure, reducing parental smoking by 15% could save \$1 billion in direct medical costs at the prenatal and neonatal levels and into childhood.

The authors’ survey of interventions and their effectiveness in this area is encouraging. Over the last decade, smoking prevention and cessation programs have become more sophisticated. A wide variety of proven interventions is now available, which are especially effective when used in combination.

Among the findings on these programs:<sup>2</sup>

- Even short counseling sessions by trained providers can reduce risks to the fetus and, thus, the need for neonatal intensive care. A study by the CDC estimates that one intense smoking cessation counseling session of at least 10 minutes, which costs \$30 and can reasonably be expected to result in an 18% quit rate, would produce a benefit-cost ratio of 3.5:1.
- One meta-analysis of the effectiveness of disseminating smoking cessation materials to pregnant women suggests a benefit-cost ratio of 12:1. The analysis estimates that if all pregnant smokers received these materials and if only 4% stopped smoking, the intervention would yield \$77 million in savings in the first year.

## Combating Childhood Obesity:

**“Childhood overweight is a significant and growing problem in our society, having tripled over the past twenty years.”**

Despite the public focus on overweight and obesity in the United States and their costs to the individual and society, until recently their growing prevalence among young children had been largely overlooked.

However, this has changed in recent years. In 2006, about 14% of preschool children, 18% of children ages six to 11, and 17% of adolescents ages 12 to 19 were overweight, with rates among children from certain ethnic minorities even higher. **This is of particular concern, since overweight preschool children are five times more likely than their healthy-weight peers to be overweight at age 12. Also, obesity persists into adulthood for 50 to 80% of overweight children and teens.**

Like smoke exposure, overweight and obesity present both health and economic costs. The numerous health problems associated with being overweight include orthopedic complications, metabolic disturbances, type 2 diabetes, disrupted sleep patterns, poor immune function, endocrine problems, impaired mobility, and high blood pressure. A recently-published, large-scale



study based on Danish schoolchildren concludes that childhood overweight is associated with an increased risk of heart disease in adulthood, especially for boys, even if the overweight does not persist. There are also psychosocial consequences, such as alienation and depression. Among pregnant women, being obese is linked to substantially higher odds of difficult deliveries, morbidity, and mortality. In addition, their fetuses are at increased risk of becoming dangerously large and of having birth defects. Economic costs are substantial:

- Between 1979 and 1999, obesity-related hospital costs for children ages six to 17 increased almost four-fold, from \$44 million to \$160 million.

- Data on overweight and obese children suggest that unhealthy weight results in \$25,688 in excess spending per year for every 1,000 kids ages five to 18.
- Costs of prenatal care for pregnant women who are overweight are five to 16 times higher than for pregnant women who are not overweight, and the costs rise with increasing obesity. In addition, prenatal and postnatal hospitalization is about 4.5 days longer for obese women than for women with healthy weights.

Unlike smoking cessation programs, the effectiveness of obesity prevention and treatment strategies is still unclear, and little evaluative research has focused

**Figure 1. Lifespan Impact of Prevention Efforts in Selected Health Areas**

LEVEL OF INTERVENTION	LIFESPAN STAGE INTERVENTION AND IMPACT*				Type
	Preconception/Pregnancy	Infant/Childhood	Adolescence	Adulthood	
Individual		Gun safety education			Injury
	Observational studies	Observational studies			Obesity
		Child-focused training			Mental health
	Parent-focused programs	Child-focused training; Parent-focused training programs			Mental health
	Smoking cessation therapy; smoking cessation therapy with partner support; Smoking cessation therapy targeting relapse		Smoking cessation therapy		Tobacco exposure
Family		Home visits			Injury
		Prenatal home visitation; Education against the use of baby walkers			Injury
		Preschool education; Parent education			Obesity
		Parent- and child-focused programs; Collaborative problem solving			Mental health
		Smoking cessation for adults living with children			Tobacco exposure
Local/ Community/ Workplace/School		Community education combined with incentive distribution for road safety; Smoke detector distribution			Injury
		Teacher curriculum			Obesity
		School-based: Fast Track			Mental health
	Bans/restrictions in workplaces and public		Media campaigns; Community mobilization		Tobacco exposure
National/State		Changes in baby walker safety standards; Child passenger safety laws			Injury
		New Hope			Mental health
			Price increases; Enforcement of age ban on sales		Tobacco exposure

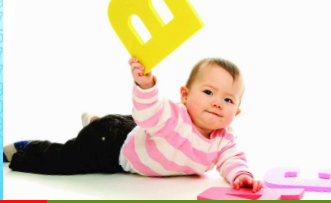
\*Citations for all studies referenced in this chart are available in the full report, which can be found at [www.PartnershipforSuccess.org](http://www.PartnershipforSuccess.org).

Note: In Figure 1, cells are color coded to show when the published interventions take place in each of the following four areas:

  Unintentional injury  
   Obesity  
   Mental Health  
   Tobacco exposure

Cells filled with darker color show that the published studies indicate positive impacts of intervention during time period noted in each of the four areas.

37.52	AmWood	4.48	5	20.74	+0.06	38.00	37
35.00	AREnot	.601	13	71.99	-23	72.97	37
37.72	AmSitter	.72	19	59.00	+42	59.47	37
27.35	AmLower	cc	41	34	+03	41.54	27
29.53	APlastic	24	15	36.25	-75	46.10	29
20.54	AmriCap			25.24	-06	29.65	20
23.27	AmriDing			37.81	-58	38.86	23
33.43	AmriDing			4.18	-74	63.08	33
31.12	AmriDing			1.00	00	31.12	31



specifically on young children. However, given the substantial and lasting costs of childhood obesity and what we know about its causes, health experts agree that aggressive action is warranted—on economic as well as health grounds. Currently, many multi-faceted approaches are underway that attempt to improve children’s nutrition, educate parents, mobilize pediatricians and other health care providers, involve schools and community organizations, and work with the food industry. These must be carefully evaluated, and the most effective strategies should be widely adopted.

## Unintentional Injuries:

**“Injuries are the leading causes of death, disabilities, and health care utilization for children and teenagers...in the United States.”**

The good news is that injuries and deaths due to such injuries have declined substantially in recent years: unintentional injury deaths declined by over 50% among children ages one to nine between 1979 and 1998. Campaigns promoting infant and child car seats, seat belt use, smoke detectors, and bicycle helmets are credited with a large part of this dramatic decline. It is clear, then, that safety campaigns with an aim to promote better-engineered consumer products and safe environments are effective ways to reduce the rates of unintentional injury and death.

One recent study estimated cost burdens of all injuries, concluding that fatal and nonfatal injuries among children aged 0-4 had resulted in \$4.7 billion for life-long medical costs and \$14 billion for both present and future productivity losses (both figures in 2006 dollars). Most childhood injuries are caused by falls, being hit by objects, motor vehicles, and fires. Since in many cases these events are preventable, the potential exists for substantial societal economic benefits through additional prevention programs.

The researchers examined the extent of that potential benefit. Their analyses suggest that different safety campaign targets have different levels of promise:

***Unlike many areas of adult health policy, “the children’s health area is much neglected. Thus in the very age group in which . . . there may be the biggest opportunity for long-term health gains, there is the least evidence.”***

- **Gun safety:** Mixed results, with some evidence that purchases of trigger locks and boxes for storage might reduce injuries.
- **Road safety:** Traffic calming, car safety measures, and bicycle helmet campaigns were all found to be effective. However, those that distributed actual items—car seats, helmets, etc.—and employed multi-faceted approaches were more effective than those that provided only vouchers or information.
- **Home safety:** Campaigns to promote smoke detector installation, reduce the purchase and use of baby walkers, and safely use lawnmowers all showed behavioral changes, but reductions in injury rates were less apparent.
- **Community safety:** New Zealand studies found that multi-faceted campaigns to improve playground and neighborhood safety were effective. Those combining education, expert advice, and funding did reduce hazards. Conversely, single-focus approaches, such as simply affixing warning labels to shopping carts to warn parents about children’s risky behavior, did not.

Because it is easier to measure behavioral changes—smoke detector installation, proper lawn mower usage—than to calculate the resulting change in injury rates, few studies allow for a benefit-cost assessment of the programs. However, the majority of studies that provided economic analysis found net benefits. Eight studies concluded that interventions reviewed were cost-effective, including three smoke alarm distribution programs, three car seat usage programs, one bicycle helmet usage program, and one study on home visits to promote safety in the house. A separate analysis of the range of studies found that 46 of the 84 preventive interventions studied yielded net societal cost savings.



## Children’s Mental Health Problems:

A 1999 Surgeon General’s report estimated that as many as one in five U.S. children has a mental health disorder causing at least mild functional disability.

Evidence shows that mental health problems, including serious ones, often begin early in life and carry long-term consequences. Even preschoolers may “act out” or be anxious, withdrawn, or depressed in ways that inhibit optimal development. Persistent behavior problems can affect educational attainment, proper social development, employment, and the likelihood of criminality.

The causes of children’s mental health problems are varied and complex and include genetic makeup, child poverty, maternal depression, and poor or abusive care. Treatment is costly—an estimated \$864 million a year—and often more effective with a multi-faceted approach. However, *not* treating mental health problems early may be even more expensive. A U.K. study assessed that the average societal cost (such as health services and public sector services) was £70,019 by age 28 (\$141,161 in 2006 dollars) for individuals with unsolved conduct disorder, ten times higher than for those without such problems.<sup>3</sup>

***“For tobacco control and injury prevention, cost-effective interventions are available and the cost savings from their implementation would be considerable. However, obesity and mental health problems are areas of more recent concern and less research.”***

Intervention strategies come in many forms, including teaching parents and children effective behavior management skills, targeting preschool teachers, and providing family psychotherapy. Because mental health is not as well-understood as physical health, and because the effects of interventions can be difficult to disentangle from other life influences, evidence of their effectiveness can be unclear. That said, childhood interventions that aim to improve parenting skills and target multiple risk factors are often more effective than others, and those targeting both parents and children showed better results than those targeting parents alone.

Because the costs of both mental health problems and their treatments are so difficult to calculate, researchers have not been able to precisely calculate net benefits. However, the paper’s authors emphasize that, given the high costs of failing to treat mental health problems early and the problems’ long-lasting impacts, benefits are likely to exceed costs. In any case, more rigorous research is critically needed to assess treatment options and to try to assess the societal benefits of various interventions.



1 Costs in this report have been standardized to 2006 dollars.  
 2 The estimated benefit-cost ratios here are high due both to the relatively low costs of the interventions and to the very high savings from reduced morbidity and mortality. It should be noted, however, that they may be slightly lower in reality, given that many women revert to smoking after the pregnancy ends.  
 3 Scott S, Knapp M, Henderson J, Maughan B. Financial cost of social exclusion: follow up study of antisocial children into adulthood. *BMJ*. 2001 Jul 28;323(7306):191.



**The Partnership for America's Economic Success** was created by a group of business leaders, economists, advocates, and a dozen funders, in order to document the economic impacts to the nation of proven investments in children from before birth and to age five. The Partnership is managed by The Pew Charitable Trusts.

This report is based on a series of papers reviewing the literature and economic analyses regarding interventions to promote children's health in key areas, authored by Bernard Guyer, Sai Ma, Holly Grason, Kevin Frick, Deborah Perry, Alyssa Wigton, and Jennifer McIntosh of the Johns Hopkins Bloomberg School of Public Health. The complete report is available at [www.PartnershipforSuccess.org](http://www.PartnershipforSuccess.org) and at <http://www.jhsph.edu/wchpc/>. The authors appreciate the thoughtful review from Beth Hare at Child Trends. The views expressed are those of the authors and not necessarily those of the reviewers, Johns Hopkins University, or The Pew Charitable Trusts.

*Investing in children is investing in our nation's economic success.*

*For more information  
(including the full paper and citations),  
see [www.PartnershipforSuccess.org](http://www.PartnershipforSuccess.org).*

***“Early environments play a large role in shaping later outcomes. Skill begets skill and learning begets more learning. Early advantages cumulate; so do early disadvantages. Later remediation of early deficits is costly, and often prohibitively so, though later investments are also necessary since investments across time are complementary. Evidence on the technology of skill formation shows the importance of early investment. At current levels of public support, America under-invests in the early years of its disadvantaged children. Redirecting additional funds toward the early years, before the start of traditional schooling, is a sound investment in the productivity and safety of our society.”***

*—Nobel Prize Winner  
and University of Chicago Professor James Heckman*

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