



# Healthy Generations

Maternal & Child Health Program  
School of Public Health

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## Children in Their Earliest Years: Many Get a Poor Start

Joän Patterson, PhD and Christopher Watson, MS, MA

Despite technological advances in the U.S. that allow us to understand and manipulate many complex aspects of our physical and social environments, we remain daunted in our ability to ensure that every child receives the basic care and nurturance needed for healthy development. Many children in the U.S. experience seriously compromised and often toxic early environments in their homes and communities: prenatal care is inadequate; too many pregnancies are unintended; too many parents receive little support in their parenting role, especially those parenting alone; increases in maternal employment have resulted in more young children in out-of-home childcare—often of poor quality; young children receive insufficient attention from hurried and stressed parents; and increasingly, many young children are exposed to traumatic family and community violence. The net result is that the development of many children is seriously threatened, and they embark on their life course with an unfavorable prognosis for their future ability to become happy, healthy, productive adults capable of contributing to society.

Advances in child development research have made it abundantly clear what young children need for healthy growth and development: physical safety (encompassing protection from harmful substances, accidental injury, and others who may hurt them); adequate nutrition; environments that offer the opportunity to play and explore the world; and nurturing, responsive interactions and consistent, comprehensive care from adults. Healthy development and children's ability to learn are dependent upon an interaction of biological maturation and characteristics of the environment, including both their physical and social worlds.

Early childhood development serves as the foundation for later competence, success in school, the capacity for healthy relationships, and a productive adult life. The

importance of early childhood development cannot be underestimated. In their report, "Neurons to Neighborhoods," a 17-member Institute of Medicine (IOM) committee reviewed and integrated current scientific knowledge related to early childhood development.<sup>1</sup> As the authors point out, there has been an explosion of knowledge about early development in recent decades. For example, early brain development is rapid and extremely vulnerable to environmental influence, prenatal and first-year exposures and experience have a profound impact affecting future learning capacity, and early-stress exposure negatively affects brain development.<sup>2</sup> We know that infants need responsive, consistent, nurturing caregivers to enable them to develop a secure attachment, which forms the basis for subsequent healthy relationships. Research also shows that inadequate nutrition impedes a child's ability to learn, communicate, think analytically, socialize effectively, and adapt to new environments and people. The earlier in life a child experiences malnutrition, the more long-lasting the negative effects. Furthermore, poor nutrition increases vulnerability to many diseases that can have devastating consequences for child development.<sup>3</sup>

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This issue of *Healthy Generations* on early childhood comes at a critical time when shrinking resources focus attention on publicly funded programs. The articles in this issue highlight current research on what children need for healthy development, the economic benefit of investing in early childhood programs, and how early intervention programs—such as Head Start—impact future health.

We thank the authors for providing us with information that supports the belief that policy and funding decisions made today will affect future generations. We hope that this issue starts a dialogue on developing both research and policy agendas that support the healthy development of young children.

-Joän Patterson, PhD and Erica L. Fishman, MSW, MPH

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Despite the explosion of new knowledge about what children need for healthy development, the IOM report suggests that applications of this knowledge have been constrained by major social and economic changes: (1) more parents of young children working outside the home and for longer hours, creating stress in balancing work and family responsibilities; (2) increased numbers of young children spend long hours in variable quality out-of-home child care; (3) high levels of family economic hardship—despite more parents working, greater maternal education, and (until recently) a strong economy; and (4) increasing cultural diversity and the persistence of racial/ethnic disparities in health and developmental outcomes.<sup>1</sup>

## Out-of-Home Child Care

The inadequacy of out-of-home child care and the shortage of high quality early childhood programs pose additional challenges to already stressed families. The care providers and early educators who are with children for long periods of time each day are among the lowest wage earners. As a result, there is a high turnover rate for early childhood educators, undermining the advantage to a young child's development of having consistent caregivers.<sup>4</sup>

## School Readiness

One of our nation's educational goals, and an increasing concern of policy makers and educators, is that all children start school ready to learn. The National Education Goals Panel identified five dimensions of school readiness: (1) physical well-being and motor development; (2) social and emotional development; (3) approaches to learning (such as curiosity, persistence on tasks); (4) language development, which includes verbal language and emergent literacy; and (5) cognition and general knowledge (such as knowing letters, sounds, numbers, shapes).<sup>5</sup> Scholars increasingly emphasize that social and emotional development—reflected in self-regulation, trusting and loving relationships with parents, and cooperation with and empathy toward peers—are just as essential to success in school as cognitive ability.<sup>6</sup>

In a national survey of 3000 kindergarten teachers, 30% reported that at least half of the children in their class lacked academic skills and had difficulty following directions and working as part of a group; 20% reported that at least half the class had problems with social skills.<sup>7</sup> Based on the Early Childhood Longitudinal Study Kindergarten Cohort, 20% of children enter school with poor social development. This percentage increases to 30% of children whose families are in the lowest quintile for income or have mothers with less than a high school education.<sup>8</sup> Similarly, children living in poverty show deficits in cognitive school readiness skills. Based on the 1999 National Household Education Survey, only 19% of pre-kindergarten 3- to 5-year-old children living in families below the poverty level had three or four cognitive/literacy school readiness skills in contrast to 45% of children at or above poverty (see Figure 1).<sup>9</sup>

## Early Childhood Intervention Programs

There are a plethora of early childhood development programs, which often target high-risk children and are designed to prepare them for school by promoting cognitive, social, emotional, and physical development. Head Start, for example, targets low-income preschool children, providing a center-based program as well as a parent component (see article this issue by Patty Petite). Other programs, such as the Infant Health and Development Program,

**Figure 1. Percentage of Children Ages 3 to 5 with Three of Four Cognitive/Literacy School Readiness Skills\*, by Poverty Status, 1993 and 1999<sup>9</sup>**



\* Cognitive/Literacy School Readiness Skills: the ability to recognize letters, to count to 20 or higher, write his/her name, read or pretend to read.

target children at risk for developmental delay by virtue of being born at low birth weight. Evaluations of high quality center-based programs provide evidence of their effectiveness in enhancing children's school-related achievement and behavior.<sup>10,11</sup>

The political will to strengthen and expand high quality early childhood programs is undermined by the concern of some policy makers that all programs have not consistently shown sustained long-term effects. However, positive benefits have been shown in school achievement and behavior for many high quality, center-based programs, particularly for poor children whose parents have little education and for programs that continue into elementary school. When effects do fade over time, it is most likely due to the poor quality elementary and secondary schools into which children transition and because they live in high-risk neighborhoods. Developmental psychologists point out that it would be "magical thinking" to expect a short-term early intervention to last indefinitely if a child continues to live and be schooled in a toxic, high-risk environment.<sup>11</sup>

## Costs of Developmental Failure

There are enormous economic costs to society when children do not develop their potential to become competent adults. They complete fewer years of education, have reduced earning potential, and lost productivity—all of which undermine our country's economic development as pointed out by Rolnick and Grunewald (see article this issue). In addition, many experience poorer physical and mental health. Some of those children showing early disruptive behavior will progress to delinquent, even criminal behavior, which is extremely costly to society. Although not well documented, it is believed that the number of youth in the juvenile justice system with co-occurring mental health problems is significant. Many of these incarcerated youth started life with significant social risks, and they lacked opportunities to develop the early childhood competencies needed to become competent, caring, contributing adults (see insert for milestones for early growth and development).

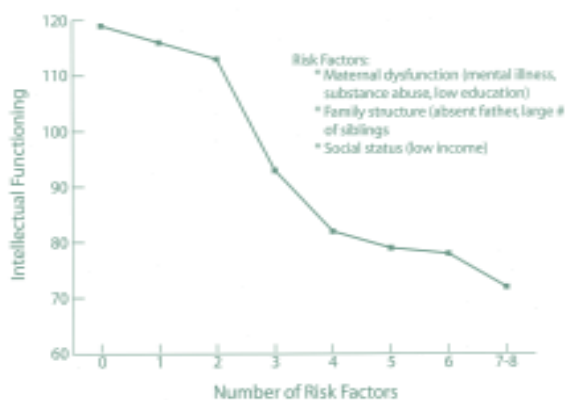
## What About Child Resilience?

As practitioners and researchers, we have become captivated with the concept of "resilience"—the ability of a person to function competently in multiple domains despite exposure to greater-than-average risks. Understanding what contributes to success in the face of adversity and how to promote it can certainly generate hope and help set an agenda for intervention programs. However, our focus on resilience too often masks the large numbers of children who do not "make it"—who do not overcome the odds and whose course of development continues in a

downward direction. It is a principle of human development, that inability to master each developmental milestone increases the odds that subsequent tasks and milestones also will not be mastered.

We know that those who are unable to overcome the odds are usually exposed to a cascade of multiple risks, such as chronic poverty, or a parent who abuses substances, is mentally ill, has less than a high school education, and/or is socially isolated. In a landmark, oft-cited study, Sameroff and colleagues<sup>12</sup> found that when young children were exposed to one or two risk factors, there was little negative impact on their intellectual functioning. However, those exposed to three or more risk factors showed significant decrements on intelligence tests. As shown in Figure 2, three or more risks was a “tipping point.” This is all the more significant because most studies of childhood resilience have found intelligence to be one of the key protective factors in the face of later life adversity.<sup>13</sup>

**Figure 2. No. of risk factors associated with level of child intellectual functioning<sup>12</sup>**



## Children with Special Health Care Needs

When infants and young children are identified as having developmental delays or special health care needs, we are challenged even further with adequately assuring they have the opportunities needed to reach their full potential. Medical, social, and educational interventions to serve these children and their families are costly. It is both ironic and a reflection of our societal investment in biomedical technology that the survival rate for low birth weight babies and those with birth defects and significant chronic diseases has increased dramatically. As a society, we have never invested the same amount of funding to assure that these same children who survive with special health needs have the services they need to grow, develop, and integrate into the mainstream of society. Although federal law mandates special education services from birth for those with developmental delay, Congress has never fully funded this mandate. The net result is that finite (and now shrinking) educational dollars are stretched even further to cover educational needs for all children.

The current Maternal and Child Health Bureau definition of children with special health care needs includes those children “at risk

### Milestones for Early Growth and Development

Competent 3-year olds are:

- Self-confident and trusting
- Intellectually inquisitive
- Able to use language to communicate
- Physically and mentally healthy
- Able to relate well to others
- Empathetic toward others

These attributes add up to a good start in life.

Carnegie Task Force on Meeting the Needs of Young Children.<sup>2</sup>

for developmental delay?” Clearly the children at greatest risk for developmental delay are those exposed to unsafe, unstimulating, toxic environments: those who experience compromised fetal development, are born too early and too small, experience early neglect, and toxic exposures in their physical and social environment.

To reduce the number of children “at-risk” for developmental delay and to ensure that all children have the opportunity to realize their developmental potential, we must develop the collective will to assure good preconceptional care for women of childbearing age; safe pregnancies and adequate prenatal care; warm, responsive, nurturing caregiving for infants and toddlers; good nutrition for pregnant mothers and children; a stimulating physical environment; physical safety; child-friendly neighborhoods; protection from violence exposure; and community support for parenting. It is our moral and ethical imperative to assure that this is an entitlement for all children living in the U.S.

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Wendy L. Hellerstedt, MPH, PhD

Traditional public health interventions to reduce adult disease risk generally focus on adult lifestyle modification. However, the risk for development of many adult-onset diseases may occur during childhood or adolescence. Some researchers, in fact, believe that the origins of adult disease may occur during fetal development. The idea that critical stimuli during fetal life can “program” the structure or function of an organism is well established in animals; however, the evidence is not clear for humans. Animal pregnancies and offspring health have been scrutinized under laboratory conditions, while the data to support the fetal origins of human disease have largely focused on a simple marker of fetal development (birthweight) or cohort studies of offspring of mothers who endured severe caloric deprivation.

### The Barker Hypothesis

The idea that chronic adult diseases, especially heart disease, might be influenced by events occurring during fetal development was first proposed by a British researcher, DJP Barker who stated that “...fetal undernutrition in middle to late gestation, which leads to disproportionate fetal growth, programmes [sic] later coronary heart disease.”<sup>1</sup> According to the “fetal origins” or Barker hypothesis, in response to starvation, the fetus reprograms its metabolism, including insulin resistance, which leads to growth retardation. The starved fetus directs its fuel for growth to the most essential organs (e.g., the brain) while other organs (e.g., the pancreas) are deprived of nutrients. This

reprogramming continues after birth and predisposes the individual to metabolic disorders, including hyperlipidemia, type 2 diabetes and obesity, as well as hypertension and other disease outcomes such as cardiovascular disease (CVD) and stroke. While some studies have shown that infants with poor growth are at risk for heart disease risk factors as adults,<sup>2</sup> others have found weak or inconsistent associations.<sup>3</sup> Because there have been fewer studies of women, it is not clear if there are sex differences in the possible association between fetal development and heart disease risk. There are several challenges to many (but not all) of the studies of fetal origins, including:

- Failure to adjust for salient variables (e.g., adult size, genes, social class, underlying maternal health) that may be related to both birthweight and the health condition of interest;
- The restriction to term births and the examination of birthweight only, which is a crude measure of fetal growth and development;
- Fetal development and heart disease do not have the same distribution globally: e.g., in China babies are small at birth and heart disease is rare; and
- Twin studies do not support the hypothesis: twins are growth retarded compared with singletons, yet do not have a higher risk for heart disease.

There is much left to understand about the association of fetal health and adult disease. Researchers are also interested in an important correlate of fetal size: maternal nutrition.

### The Dutch Famine: A Natural Experiment of Maternal Deprivation

Fetal nutrition is certainly affected by maternal nutrition. So, is there any evidence that maternal nutrition is associated with the adult health of offspring? The classic study of maternal nutrition and adult health is the Dutch Famine Study.<sup>4</sup> This study examined adults whose mothers were pregnant and survived the “Dutch Hunger Winter” and adults whose mothers were not exposed to famine during their pregnancies. The “Dutch Hunger Winter” offered a remarkable, and tragic, natural experiment in starvation. In 1940, the Netherlands were invaded by Germany and, by 1941, all food had been rationed to assure adequate nutrition for the population. However, toward the end of 1944, the Nazis imposed a food embargo in specific regions of the Netherlands, producing food shortages and, ultimately, famine. At the height of the famine, the Dutch were restricted to an intake of 400-800 kcal/day. By early summer 1945, the Allies had liberated the Netherlands and the famine was over. More than 20,000 people died of famine-related causes during the short period. This natural experiment was ideal to examine the effects of maternal nutrition on subsequent health: the famine occurred over a specific time period and in a specified region of the Netherlands. There was documentation of the temporal fluctuations in caloric restriction, so caloric intake could be estimated for the population during each month of this terrible period. Researchers began studying the effects of the famine when the infants of the women who conceived, were pregnant, and/or delivered during or shortly before or after that period reached adulthood. Of these adults, a cohort of 2155 people was formed. Data from the Dutch Famine Study<sup>5,6</sup> shows that adults who had been exposed to famine *in utero* were at higher risk than those not exposed for:

## Data Moment

New  
Feature!

### Response Rate

**Response rate** refers to the number of respondents who completed a survey relative to the number of people who were asked to complete the survey. A poor response rate compromises the validity of a survey because non-respondents may be different in some systematic way than respondents; thus the results may be biased because only a self-selected subgroup of the intended sample chose to respond. It is possible that a survey with a poor response rate reflects an inordinate percentage of a specific demographic from the intended sample (e.g., only men respond to a survey whose intended sample is half men, half women). Poor response can also lead to misleading results if those who responded vary from non-respondents on key survey questions (e.g., only those who agreed with the perceived political sentiments of the surveyors responded). The careful reader may also want to pay attention to item-response rates, which reflect the percent of respondents who answered a specific item on a survey. Item non-response can be a problem, especially if a survey contains some sensitive or difficult items that respondents may choose to skip. The careful researcher should: (1) do her best to show how specific characteristics of the non-respondents and respondents compare, to address the representativeness of the survey sample; and (2) address item non-response. The latter is infrequently done and is only sometimes found by the reader who may notice that the sample size for some variables is not the same as the number of survey respondents.

- schizophrenia and other psychological disorders;
- obesity;
- cardiovascular risk factors, such as glucose intolerance and lipid problems; and
- coronary heart disease.

With the exception of psychological disorders, however, many of the associations were weak. And, no strong association of famine on blood pressure was observed in this study or in another study of adults whose mothers were likely exposed to famine during the siege of Leningrad during World War II. The study of the Leningrad survivors, in fact, showed that maternal malnutrition was not associated with any excess risk for cardiovascular disease.<sup>7</sup>

### Future Directions

The data from the Dutch Famine Study—and several studies that have shown associations between birthweight and CVD risk markers—are intriguing and support taking a life course approach to chronic disease. However, causality questions remain. Studies of more specific components of maternal nutrition, critical phases of prenatal life, and postnatal indices of fetal development, could reveal one or more biological pathways and possibly, treatments for major human diseases.

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## Interested in making a difference internationally?

### Consider a Master's in Public Health (MPH) Degree in Maternal and Child Health (MCH)

#### International Opportunities: From Minnesota to Madagascar.

This summer, MCH student, Anna Baker, spent three months in Madagascar, setting up nutrition centers in the remote southern area of the country. The centers serve severely malnourished children, and their mothers, who live in the drought-stricken region. Anna worked as an intern with Catholic Relief Services/Madagascar to fill her MCH field placement requirement. In addition to “living in the bush,” she helped write and edit grants and learned, first-hand, how to translate ideas into working programs.

“Getting a program up and running was harder than it first appeared,” said Anna. “We had few resources to work with. Instead of making sure there was a working computer at each center, we had to figure out how to light the center rooms without electricity and make sure there would be enough water to feed and bathe the babies each day. I learned how to make do with few resources and I had a great experience.”

Although School of Public Health coursework focuses mainly on domestic issues, the skills learned translate abroad. Your dreams of tromping through the African bush, bringing hope and healing to the suffering masses can be realized—and funded! The School of Public Health, through the Cecelia Goetz scholarship, and the Maternal and Child Health Program jointly funded Anna’s field placement. There are also many other scholarships available, within the SPH and throughout the university, for international experiences. For more information, visit the University of Minnesota Office of International Programs at <http://www.international.umn.edu>. To learn more about the MCH Program, read on.

**What is the MCH Program?** It is a training program for MPH students who are interested in promoting and preserving the health of families, including women, children, and adolescents. The Program is in the Division of Epidemiology in the School of Public Health at the University of Minnesota.

**Who should apply?** People who care about vulnerable populations and want careers in program planning and development, evaluation, surveillance, assessment, teaching, or research. The program offers a special emphasis on MCH epidemiology for interested students. Clinical professionals, and others with advanced degrees who are interested in administering MCH-related health programs or conducting research projects are also encouraged to apply. Individuals with advanced degrees may have the option of completing the two-year MPH Program in one year.

**For further information about the MCH Program.** Call 612-626-8802 or 1-800-774-8636; email [gradstudies@epi.umn.edu](mailto:gradstudies@epi.umn.edu); or visit <http://www.epi.umn.edu/mch> and <http://www.umn.edu>



Terrie Rose, PhD

*Sophie was 11 months old, living with her 21-year old mother and father in an inner-city housing project, when she arrived for her second day of childcare. Sophie's dad wheeled her into the childcare room in her stroller, signed her in, and walked out. The teachers watched to see if Sophie noticed her dad leave, for indications that she wanted to get out of the stroller, and how she felt about being left with unfamiliar adults and children. Sophie sat expressionless in the stroller and remained that way as the teacher lifted her onto the playroom floor.*

Recent investigations in the areas of infancy and early childhood have resulted in extraordinary new understandings of what children need in order to develop typically. Research suggests that it is the development of secure and responsive attachment between a young child and the significant adults in her life that provides a strong and lasting foundation for later growth and development.<sup>1,2</sup> Fortunately for parents, predictable routines such as feeding and playing provide the everyday experiences and learning opportunities by which a young child develops the groundwork for competence and a sense of well-being.

Research on the brain (incorporating neuro-imaging technology), neurobiological change, the role of the environment, and the influence of early relationships are elucidating the interconnections of experience and biology.<sup>1,3,4</sup> Neuroscientists are highlighting the impact of early experience on development in multiple domains, including neurobiological systems, at the level of neuronal and synaptic development, and behavioral and emotional functioning. For example, the presence of a responsive and consistent caregiver provides essential early regulation of infant emotion and arousal, laying the foundation for the baby's ability to regulate her emotions, behavior, and social connections.<sup>5,6</sup>

### Influence of Child, Caregivers, and the Environment

Development during early childhood is robust as the child, significant adults, and the environment come together to create the conditions necessary for the child's success. A baby's adorable round face and eyes, his parents' ability to take his perspective—to see through his eyes—and extended family connections are strengths that facilitate a child's pathway towards competence. For every child there are challenges; the strengths of the triad—child, caregivers, and environment—will assist the child in managing these challenges and continuing towards a sense of well being and competence.<sup>7</sup> Even when a child is born with a biological limitation such as Down syndrome, a parent's strong understanding of child development and sensitivity to his child's needs along with the support of a caring community and adequate resources, can work to tip the balance towards promise and success.

However, vulnerabilities can arise when there are limitations or obstructions in what are considered typical and expected opportunities. Research suggests that young children, when compared with older children, are particularly vulnerable to and may experience lasting consequences when nurturing and responsive care is unavailable and/or adequate resources within the child's environment are severely limited.<sup>2</sup> For example, when a young child is a victim of maltreatment, she may develop behaviors such as hypervigilance or lack of engagement, which

can be adaptive as a way to help her avoid victimization. While adaptive in the short-run, these alterations in behavior may have long-term maladaptive outcomes such as increased anxiety, aggression, and/or hyperactivity behaviors. As this child enters school, these behaviors may interfere with her ability to explore the environment, interact with peers, or focus attention in a classroom setting.<sup>2,8,9</sup>

Considering the strengths and challenges brought forward by the triad of child, significant adults, and environment is essential in providing effective and flexible prevention and intervention services. Listed below are examples of strengths and challenges. It is the magnitude and the way in which the components come together that tip the balance towards resilience or risk.

	Strengths	Challenges
<b>Child</b>	Typical development Easy-going temperament Attractiveness	Prematurity Deregulated sleep patterns Colic
<b>Caregiver</b>	Realistic expectations Sensitivity to baby's cues Ability to maintain friends	Alcohol and drug use Depression History of abuse
<b>Environment</b>	Supportive extended family Family focused opportunities Cultural and religious support	Poverty Community violence Lack of resources

Research provides an alarming view of risk factors related to poor outcomes for young children that have significant consequences when presented early in life when development is rapid and multiple developmental systems are being integrated. These effects are well documented throughout the literature and include significant deficits in social-emotional functioning, deficits and delays in cognitive and language functioning, and poor school performance.<sup>1-3,10</sup> Furthermore, exposure to multiple risk factors increases the likelihood of childhood learning and behavior problems.<sup>11</sup>

### Risk or Resiliency

Resiliency research suggests that prevention and intervention services for at-risk children that are flexible and which address both the parent-child and contextual needs of individual parents and children are likely to be most effective.<sup>2,8,11</sup> In the context of parental deficits and stress, alternate caregivers play a critical role in supporting a child's development by facilitating the acquisition of self-regulatory skills, the ability to provide clear cues and signals, and the child's sense of mastery.<sup>11,12</sup> Well known demonstration projects have documented the value of multi-component, early interventions for preschool age children from low income families.<sup>13</sup> Most effective programs engage parents in settings where they are most comfortable, including: the home, the childcare setting, and community sites.<sup>14,15</sup>

*For Sophie and her family, enrollment in high-quality childcare with integrated social support services provided a rich opportunity for prevention and intervention services. Over time, her experiences in childcare, facilitated by sensitive and consistent teachers, provided a boost in Sophie's social, cognitive, and language skills. She became engaging and playful. Sophie's mom, who stated at the start of the program that "[Sophie] doesn't care about me," grew to be responsive and engaged in Sophie's growth and development. A family facilitator working closely with the parents found that significant domestic violence was influencing their ability to parent effectively and worked with them to engage in services and behaviors that would not threaten their ability to parent or their child's ability to successfully negotiate the pathway of early childhood.*

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## Saving Lives and Improving Outcomes: Newborn Screening in Minnesota

With the expansion of the traditional blood spot screening (performed on a drop of blood obtained from the newborn's heel) and the addition of voluntary universal newborn hearing screening, Minnesota newborns and their families are benefiting from one of the most comprehensive and coordinated newborn screening programs in the country. It is estimated the combined public health/newborn screening program will identify approximately 270 newborns and their families every year who will need early intervention.

Expansion of the traditional blood spot screening was initiated in a "pilot phase" in 2001 and instituted via legislation in 2003. This expansion increased the disorders that are detectable by the blood spot screening from five to over 30. The newly detectable disorders include many inborn errors of metabolism such as fatty acid oxidation disorders, organic acidemias, and amino acidemias. Over the two-year pilot phase, an additional 45 newborns have been successfully identified and treated as a result of this expansion.

The development of reliable, low-cost hearing screening methods for newborns is creating a new standard of care in Minnesota and the nation. Congenital hearing loss occurs in 3/1000 births, and is the most common birth defect. Currently, 105 of the 111 Minnesota birthing hospitals are screening hearing of all newborns. Recent evidence shows that for children with congenital hearing loss, intervention before six months of age improves outcomes in language, cognitive, and social abilities. This knowledge drives the program's "1-3-6" promotion, which endorses screening by 1 month of age, diagnostic evaluation by 3 months of age, and intervention by 6 months of age. Now that newborn screening is becoming a standard of care, the program will increase efforts to assure comprehensive follow-up and treatment for identified infants.

The merger of the blood spot screening with the hearing-screening program provides many opportunities to maximize and share available resources. In addition, this merger creates a centralized system for tracking and follow-up of identified infants—an essential function of public health screening programs. The success of this combined program is also dependant upon collaboration with the University of Minnesota, Mayo Clinic, local public health, medical home providers, parents, and other stakeholders.

The future of newborn screening holds many interesting possibilities: screening for hidden birth defects, genetic testing for adult onset diseases, and many others. These possibilities, although interesting, will be balanced by the public discourse and the public health impact of such opportunities.

Additional information about the Minnesota combined newborn screening program is available at: [www.health.state.mn.us/divs/fh/mcshn/nbs.htm](http://www.health.state.mn.us/divs/fh/mcshn/nbs.htm).

## Rob Grunewald and Art Rolnick, PhD

There is nothing like a budget deficit to focus attention on how a state appropriates its public funds. Suddenly, such old-fashioned economic ideas like trade-offs and opportunity cost are in vogue as public officials and citizens ask themselves the question: What is the best use of our limited resources?

That question is always pertinent, of course, but when times are flush there is a tendency to disregard the word “limited” and make optimistic assumptions about the future level of resources. We can’t do that today. Thus, there is no time like the present for Minnesotans to take a hard look at how they spend their limited public revenue. Choices made today will have a lasting impact on our quality of life, even after good times return; indeed, current choices will likely impact just how good those days become.

This is especially true when we talk about economic development. The current budget troubles come on the heels of a recent debate about the best way to ensure that Minnesota’s economy continues to grow. Many have suggested that the state’s economy is in need of repair, and that we need to prepare for changes in the economy. Advocates have called for government to establish venture capital funds, to subsidize new industries like high-tech and biotech, to build new stadiums, to grant more special favors so businesses can move from one community to another and to turn the University of Minnesota into a research arm of local industry.

None of those plans makes economic sense; that is, research has shown that government involvement in private business is, at best, a zero-sum game, and many times the returns are actually negative. You can’t help the state’s economy by moving jobs from one town to another, or by trying to guess the latest tech craze, or by gambling funds on risky venture deals, or by turning one of the country’s best research universities into a patent office.

What can we do? We can invest in early childhood development programs. These programs are rarely viewed within the context of economic development, but we think that is a mistake.

The economic returns to education, both for students and for society, are well documented, and Minnesota has certainly benefited from its historical emphasis on a quality education for all children. Our state has one of the most successful economies in the country because it has one of the most educated workforces. In 2000, almost a third of persons 25 or older in Minnesota held at least a bachelor’s degree, the sixth highest rate in the nation, and our K-12 test scores consistently rank us among the elite states.

But these statistics mask a starker reality for an estimated 20,000 3- and 4-year-old children living in poverty throughout the state in rural communities, larger towns, and in the metro areas. These children often enter kindergarten without fundamental reading or language skills. These children begin at a disadvantage and they never catch up. They are destined for low-skill, low-paying jobs, and many will experience trouble in school and with the law.

These disadvantaged children are not only shut out from Minnesota’s famed high quality of life, but they also impose social costs on the rest of society. And that’s where the budget and economic development come into play. Research has shown that investment in early

childhood development programs brings a real (that is, inflation adjusted) public return of 12% and a real total return, public and private, of 16%. We are unaware of any other economic development effort that has such a public return, and yet early childhood development is rarely viewed in economic development terms.

It is time for Minnesota to put its money where the return is: Prepare our disadvantaged children for a successful education and the opportunity for personal achievement. We should create a foundation for early childhood development.

This idea isn’t new. Minnesota has spent millions on Early Childhood Family Education, School Readiness, and Head Start programs. The problem is, the programs are substantially underfunded. They do not reach all children from low-income families; for example, only half of eligible children receive Head Start services. Furthermore, most of these programs don’t have the resources to provide the level of quality required to produce the demonstrated high return on investment. Some will argue that middle class children would also benefit from such programs. But again, when it comes to return on investment, the highest return comes from investing in financially disadvantaged children.

Of course there is no free lunch, as economists are so fond of saying. A dedicated program open to all poor children across the state won’t come cheap; on the other hand, it’s only about the cost of two or three sports stadiums. With an endowment of \$1.5 billion—gathered from government and private sources over a five-year period—a foundation could fund high-quality, targeted programs to reach 20,000 disadvantaged children annually.

In practice, it would be almost impossible to reach every needy child in the state because such a program would depend on the willingness of parents to participate. But educating parents and giving them proper incentive would be part of the funding strategy.

This idea is based on solid research and similar programs that have proven successful in other parts of the country. Finally, many in Minnesota—including some in the legislature—are committed to early childhood development and some are already working toward these goals.

Minnesota has a chance, even in tough budgetary times, to make proper use of its limited public resources—invest those resources where they can get the best possible public return, which is the correct way to evaluate economic development.

A version of this opinion piece appeared in the *Minneapolis StarTribune*, February 6, 2003. This article also appeared in the March 2003 *Fedgazette*. It can be accessed along with the full report at <http://minneapolisfed.org/pubs/fedgaz/03-03/opinion.cfm>. Reprinted with the authors’ permission.

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Wendy L. Hellerstedt, MPH, PhD

Early life experiences of adopted children are rarely known with certainty. This is especially true for adopted children who are born outside of the United States, as they are often orphaned because of social, political, and/or economic upheaval. In fact, international adoption—in the U.S. and elsewhere—has its origins in war. Among the first international adoptees were orphans from Europe after World War II. After the Korean War, South Korean orphans accounted for more than half of the international adoptions in the U.S. by the 1970s. Political and economic strife continue to characterize countries with a high number of orphaned children. In the 1990s, the U.S. received a large number of children from Romania. More recently, countries like China and Russia have made orphanage-reared children available for international adoption.

The U.S. is one of the primary adopting countries in the world. In 2002, there were 21,100 international orphans adopted in the U.S. Of those, 37% were from Europe, 46% from Asia, and 11% from Central America; 44% were younger than 1 year and 43% were 1–4 years old at adoption. Per capita, Minnesota has one of the highest rates of international adoption in the U.S.

Adoption can be seen as an intervention to promote child health and well-being. However, there has been little research about the physical, psychological, or social ramifications of international adoption for children or their adoptive parents. Because of this, a multidisciplinary team of researchers at the University of Minnesota conducted the first-ever survey of families who adopted internationally, the International Adoption Project (IAP). The team, led by Megan Gunnar, PhD (Institute of Child Development), included University researchers from the International Adoption Clinic, the Department of Family Social Science, the Department of Psychology, and the Maternal and Child Health Program in the School of Public Health. The team attempted to survey each of the 3198 Minnesota families who collectively adopted almost 4000 children internationally between 1990–1998. This survey of the pre-adoption and post-placement experiences of parents and adopted children was done collaboratively with adoptive parents, adoption agencies, and the Minnesota Department of Human Services.

## International Adoption and Early Childhood Experiences

Most of the existing research about adoption concerns domestic adoption. Studies that have examined trans-racial adoptions have usually focused on the adoption of African-American children by white parents. The strength of the IAP survey is that it is the first population-based study in the U.S. to address the experiences of multi-cultural families that were created through international adoption. It also examines the needs of children who experienced some period of early life in orphanage-like institutions compared with those who experienced some kind of family care.

IAP received surveys from 1857 families who adopted 2292 children between 1990–1998 (a 56% response rate). At the time of the survey, the adopted children were, on average, 8 years old. Thus, parents

were able to comment about their child's school and social performance, identifying successes as well as perceived gaps in services. The children came from 37 countries, but seven areas accounted for 79% of the children: South Korea (32%), Columbia (11%), China (10%), Russia (8%), India (7%), Guatemala (6%), and Romania (5%). Fifty-four percent of the children had spent more than one month living in an orphanage prior to adoption. Analyses are underway to examine how early institutionalization may be related to child psychological functioning.

The IAP team found that parent suspicion of pre-adoption risk factors ranged by area of the world in which the child was born (Table 1).

Past research in child development has shown that the type of early risk factor may not be as important as the number of risk factors a child is exposed to relative to post-adoption adjustment or development. In the IAP survey, 78% of the children had three or fewer suspected risk factors. A strong finding was that children who were adopted prior to 6 months of age had few pre-adoption risk factors. As the age of adoption increased, the number of risk factors increased: nearly 50% of the children adopted after 24 months of age had four or more risk factors. This finding suggests that early placement should be a priority for improving outcomes for adopted children.

In addition to an examination of the association of early life experiences to child development, the IAP team is examining a variety of demographic, environmental, social, and psychological variables, including: parents' perceptions of racism directed toward them or their child, pre-adoption parental preparation, child academic and social achievements, financial costs of adoption, perceived needs for services for internationally adopted children, and child involvement in enrichment experiences to maintain cultural ties. These findings, and others, are posted on the IAP website at <http://education.umn.edu/ICD/IAP>. A resource guide, created by and for adoptive parents, is also available on the website.

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**Table 1. Percent of children, adopted in Minnesota between 1990–1998, with suspected early lifetime risks, by area of birth. International Adoption Project, n=2292.**

Suspected Risk Factor	Europe	Latin America	Asia
Prenatal drug/alcohol exposure	44%	15%	9%
Prenatal malnutrition	50%	41%	24%
Premature	30%	14%	28%
Physically neglected	45%	26%	12%
Socially neglected	57%	22%	13%
Physically abused	13%	6%	3%
Early life in institution	79%	17%	13%

Patty Petite, MEd

Awareness, education, prevention, and early intervention are all strategies that have a place in the effort to bring improved overall health to American Indians. Statistics from the Centers for Disease Control and Prevention show a very high incidence of diabetes, alcoholism, accidental injuries, motor vehicle crashes, and suicide among American Indians as compared to the general population.<sup>1</sup> Knowing these facts prompted action on the Fond du Lac (FDL) Reservation in northeastern Minnesota.

Health issues are addressed early at FDL through early childhood programs like Head Start and Early Head Start. These programs serve children from 0 to 5 years who are of American Indian descent, live on or near the reservation, and come from low-income homes.

FDL Head Start is based on the philosophy that all children share the need for social, physical, and emotional interaction. Children in the program participate in a rich variety of activities that include learning numbers, letters, and sounds, creating art projects, and learning to interact with others. In order to ensure that children attain the maximal benefit from the social, emotional, and cognitive elements of the program, a critical portion of the curriculum focuses on health, wellness, and nutrition. Highlights from the list of issues discussed with Head Start students and families demonstrate the range of the coverage given health/wellness issues at FDL Head Start (see sidebar).

## Program Components

**Health and wellness.** Early childhood programs at Fond du Lac enjoy the full-time services of a nurse. Typical nursing services delivered on a daily basis might include: attending to sick children and accidents, meeting with parents, following up on treatment plans, presenting workshops and in-services, CPR instruction, first aid instruction, and playground and classroom safety.

Health and wellness services at the FDL Head Start benefit from a Health Advisory Committee that is under the leadership of the Head Start nurse. Other members include program managers, parents, community health agency representatives, physicians, and foster grandmothers. Community input to the program is also provided via this committee. The functions of the Health Advisory Committee include:

- Establish goals and objectives for delivery of health services
- Assist in developing a written plan
- Develop protocols for screenings, tests, examinations, and collaborative agreements
- Assist in providing periodic and on-going self-evaluation of health services
- Ensure cooperation of health professionals in providing health care

Children come to school with immunizations, dental checkups, and birth certificate and income verification in place. The Head Start nurse is on duty at all times during school hours. In addition, public health nurses have an on-site examination room in the Head Start building that is made available each week to parents to schedule Child and Teen Checkup (C&TC) appointments. Head Start requires each child to have a yearly C&TC.

In an effort to reduce injuries resulting from motor vehicle crashes, infant car seats are distributed to FDL families with infants and children. Car seats come with thirty minutes of instruction from a public health nurse on safe and appropriate use.

One of the most anticipated public health events in recent years is the annual baby shower. The shower is hosted by FDL early childhood programs and targets those who are pregnant, thinking of becoming pregnant, or who have recently delivered a baby. It has all the trappings of a regular baby shower—door prizes, baskets of “goodies,” and good food. In addition, it features information on prenatal care, early identification and prevention of problems, parenting skills, and fatherhood. There are panel discussions for men and women. The baby shower has been very well attended (approximately 150 this past June) and it is hoped that it points the family and the baby in the right direction.

**Nutrition services.** Breakfast, lunch, and snack menus are carefully planned to be nutritionally balanced and sound. Meals are served family style in the classrooms. Adults in the classroom eat with the children and role model not only good table manners but healthy eating habits along with cleanliness and good dental hygiene.

**Specialized education services.** FDL Head Start has on-site special education staff members who are funded by the Northern Lights Special

## Maternal and Child Health Early Childhood Grant Award

Wisconsin's Maternal and Child Health Program has received a four-year, \$550,000 federal grant to enhance the state's early childhood service system. As more and more research underscores the importance of early childhood care and development, the state will use the grant to help improve service collaboration among various child care providers and early childhood interests.

“Our ultimate goal is to craft a more cohesive system, so that all children are healthy and ready to learn when they enter school,” said Susan Uttech, who oversees the Title V Maternal and Child Health Block Grant.

This is important in Wisconsin where the state's landmark Wisconsin Works welfare program has highlighted the need to help families of young children whose mothers have entered the workforce. Societal changes have transformed the work world in general, and have made out-of-home child care more common for all children.

With the grant, the MCH program will hire a project director to help facilitate existing groups' early childhood efforts. A chief by-product of the grant will be a statewide Early Childhood Comprehensive Systems plan to lead a more cohesive system forward.

For more information contact: Kevin Wymore, Policy, Planning and Outreach Consultant (608) 267-9188 or [wymorks@dhs.state.wi.us](mailto:wymorks@dhs.state.wi.us).

Education Cooperative, a collaboration of area school districts. Staff members work individually with students who have a variety of needs including social and emotional development, speech problems, and physical and occupational therapy. They also make available the services of an audiologist, enabling children with chronic hearing problems to be treated locally in a timely manner, and in a comfortable setting.

**Culturally responsive education.** In partnership with Cloquet School District and the University of Minnesota-Duluth, FDL Head Start used a Minnesota Department of Education grant focused on culturally responsive childcare to produce two wonderful board books for very young children: *Our Journey*, a beautifully illustrated book greeting and thanking the four directions in the traditional fashion, and *Boozhoo, Come Play with Us*, a picture book filled with children of the Fond du Lac Band and highlighting words in the Ojibwe language. The two books begin to fill a gap for authentic information on American Indians for children of all races.

## Fostering Success

Research shows that at-risk children who receive quality early childhood education are more likely to succeed in later years. Quality early education—whether provided at home, in a child care or school setting—fosters mental, emotional, and social development. It is important to integrate culturally sensitive and specific information into early childhood education. The Fond du Lac early childhood programs provide an excellent model of this approach.

Fond du Lac early childhood programs have many partners who work to address the needs of FDL children: Carlton County, St. Louis County and Fond du Lac Reservation Public Health Nurses, Min No Aya Win Human Services medical clinic, other area clinics, Arrowhead Resource and Referral, Minnesota Women, Infants and Children (WIC) supplemental nutrition program, and the Indian Health Service. The goal is to address the health needs for the Fond du Lac community in the most effective and efficient means possible. By carefully integrating health services to make it easier to use, it is hoped that no one will fall through the cracks and, more people will take advantage of it.

Education of today's youngsters is geared to benefit the children and their families in this generation. Traditionally, American Indian culture looks seven generations into the future for cause and effect of actions taken. Looking to Indian tradition, it is believed that each generation will build on the previous one; in this case, improving American Indian health and wellness in each successive generation. We are all a part of a seventh generation!

## References

1. U.S. Department of Health and Human Services. Center for Disease Control and Prevention. Surveillance for health behaviors of American Indians and Alaska Natives: findings from the Behavioral Risk Factor Surveillance System 1997-2000. *Morbidity and Mortality Weekly Report* 2003;(August 1). Available from: [www.cdc.gov/mmwr/preview/mmwrhtml/ss5207a1.htm](http://www.cdc.gov/mmwr/preview/mmwrhtml/ss5207a1.htm). Accessed September 2003.

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## Head Start Family Education Topics

### September

- Separation anxiety
- Bus and seat belt safety
- Hand washing
- Dental kit tooth brushing instruction
- Vision and hearing screening
- First height and weight record for each child

### October

- Fire safety
- Sleep safe program
- Good touch/bad touch
- Child abuse/neglect
- Halloween safety
- Disability awareness

### November

- Diabetic awareness
- Smoking prevention
- Alcohol/drug safety program
- Shaken-baby syndrome

### December

- Mental health/depression awareness
- Winter safety
- Toilet training/bed wetting

### January

- SIDS (sudden infant death syndrome) awareness
- WIC (Women, Infants and Children Supplemental Nutrition Program)
- Second height and weight record for each child

### February

- Dental health month recognized
- Heart health awareness
- Baby bottle tooth decay awareness

### March

- National nutrition month recognized
- Poison control month recognized
- Asthma awareness
- Picky eater/feeding problems

### April

- FAS (fetal alcohol syndrome) and FAE (fetal alcohol effects)
- Week of the young child celebrated
- "Hands are not for Hitting" program

### May

- Health fair
- Women's health issues
- Child and teen checkups and immunizations
- Third height and weight record for each child
- Sun Safety

### June

- Fatherhood
- Water safety
- Infant massage
- Community baby shower

### July

- Heat exhaustion/kids left in cars
- Thumb sucking
- Tantrums
- Sleep problems

### August

- Promote completion of child and teen checkups
- Promote completion of physicals for children for upcoming school year
- Work on getting immunizations and dental exam records for upcoming school year

# Healthy Generations Videoconference

UPCOMING  
EVENTS

**Early Childhood**  
**Thursday, November 6, 2003**  
**1-3 pm**

**Beltrami County**  
Community Services Center  
Suite 250  
616 America Avenue  
Bemidji

**Carlton County**  
Carlton County Courthouse  
Classroom  
301 Walnut Street  
Carlton

**Crow Wing County**  
Courthouse  
Multimedia Room  
326 Laurel Street  
Brainerd

**Grant County**  
Grant County Courthouse  
10 Second Street NE  
Elbow Lake

**Hennepin County**  
MN Dept. of Health  
Room 118B  
717 Delaware St. SE  
Minneapolis

**Nobles County**  
Courthouse, Room 111  
315 10<sup>th</sup> Street  
Worthington

**Ramsey County**  
MDH Distance Learning Center  
3<sup>rd</sup> Floor, Metro Annex  
130 E. 7<sup>th</sup> Street  
St. Paul

**Redwood County**  
Redwood County Courthouse  
Third and Jefferson  
Redwood Falls

**Stearns County**  
Human Services, Room 21  
705 Courthouse Square  
St. Cloud

**SAVE THESE DATES!**

**MCH Summer Institute**  
June 21-22, 2004  
Earle Brown Center  
University of Minnesota,  
St. Paul Campus

For more information contact:  
Jan Pearson at: [pearson@epi.umn.edu](mailto:pearson@epi.umn.edu)  
or visit our web site: [www.epi.umn.edu/mch](http://www.epi.umn.edu/mch).

**Proceedings from the 2003 MCH Summer Institute:** Presenter information, PowerPoint slides, and audio records can be found at <http://www.epi.umn.edu/mch/summer/2003/shtm>

**Cultivating the Future:  
Advocating for the Health of  
Adolescents in Times of Drought**

December 17, 2003  
University of Minnesota Campus

For more information contact:  
Glynis Shea at: [sheax001@umn.edu](mailto:sheax001@umn.edu) or  
612.624.3772.

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