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NATIONAL SCIENTIFIC COUNCIL ON THE DEVELOPING CHILD

# Establishing a Level Foundation for Life: Mental Health Begins in Early Childhood

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WORKING PAPER 6



Center on the Developing Child  HARVARD UNIVERSITY

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The National Scientific Council on the Developing Child is a multidisciplinary, multi-university collaboration designed to bring the science of early childhood and early brain development to bear on public decision-making. Established in 2003, the Council is committed to an evidence-based approach to building broad-based public will that transcends political partisanship and recognizes the complementary responsibilities of family, community, workplace, and government to promote the well-being of all young children. For more information, go to [www.developingchild.net](http://www.developingchild.net).

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# The Issue

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THE SCIENCE OF EARLY CHILDHOOD DEVELOPMENT TELLS US THAT THE FOUNDATION FOR SOUND mental health is built early in life, as early experiences shape the architecture of the developing brain. These important experiences include children's relationships with parents, caregivers, relatives, teachers, and peers, which play a critical role in shaping social, emotional, and cognitive development. While concerns about cognition and language are already the focus of much public attention, emerging emotional and behavioral difficulties in the early years are also important societal issues that must be addressed. Attention to early mental health concerns is warranted because these kinds of problems impair emerging capacities for learning and relating to others.

Sound mental health provides an essential foundation of stability that supports all other aspects of human development—from the formation of friendships and the ability to cope with adversity to the achievement of success in school, work, and community life. Similar to the way a wobbly table may not function well if the floor is uneven, the legs are not aligned, or the tabletop is not level, the destabilizing consequences of problems in mental health can be caused by many interdependent factors. Just as small “wobbles” in a table can become bigger and more difficult to fix over time, the effective management of mental health concerns in young children requires early identification of the causes and appropriate attention to their source, whether they reside in the environment, the child, or (most frequently) in both. Understanding how emotional well-being can be strengthened or disrupted in early childhood can help policymakers promote the kinds of environments and experiences that prevent problems and remediate early difficulties so they do not destabilize the developmental process.

The scientific evidence is clear: Significant mental health problems can and do occur in young children. In some cases, these problems can have serious consequences for early learning, social competence, and even lifelong health. Children can show clear characteristics of anxiety disorders, attention-deficit/hyperactivity disorder, conduct disorder, depression, post-traumatic stress disorder, and other problems at a very early age.<sup>1</sup> And older children often exhibit the emotional legacy of early abuse or neglect.<sup>2</sup> Early mental health problems merit attention because they disrupt the typical patterns of developing brain architecture and impair

emerging capacities for learning and relating to others. And regardless of the origin of mental health concerns, new research clearly indicates that early intervention can have a positive impact on the trajectory of common emotional or behavioral problems as well as outcomes for children with serious disorders.

All children experiencing prolonged adversity are at risk for cognitive and mental health problems. Studies show, however, that the long-term impact on physical and mental health is most likely to affect individuals who are genetically more vulnerable to stress. But genetics is neither

## **The scientific evidence is clear: Significant mental health problems can and do occur in young children.**

destiny nor “hard-wired”; our genes contain instructions that tell our bodies how to work, but the environment leaves a signature on the genes that authorizes or prevents those instructions from being carried out (or even speeds them up or slows them down). Thus, the interaction between genetic predispositions and sustained, stress-inducing experiences early in life can lay an unstable foundation for mental health that endures well into the adult years. Early exposure to child abuse or neglect, family turmoil, neighborhood violence, extreme poverty, and other threats in a child's environment can prime neurobiological stress systems to become hyper-responsive to adversity.<sup>3</sup> Adverse experiences such as these early in life, particularly for vulnerable children, predict the emergence of later physical and mental health problems, including disorders like major depression.<sup>4,5</sup>

Although mental health challenges for young children share many biological and behavioral characteristics with those of older children and adults, there are at least three ways in which early childhood is a period of special vulnerability. First, psychological health for young children is very strongly influenced by their environment of relationships and the support or risks these relationships confer.<sup>6</sup> These relationships can

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buffer the impact of adverse early experiences to make them tolerable. Therefore, to understand the reasons that young children may be at risk for impairments, how best to provide assistance, and the strategies for promoting positive mental health, it is important to look at the quality of their early environments and relationships. To a greater extent than is true of older children and adults, viewing the child alone as the “patient,” or the source of the problem, can lead to costly or ineffective policies and practices.

Second, cognitive, social, and emotional capacities are all intertwined within the architecture of the brain, and these capacities are

qualitatively different at different ages, as the brain matures. For example, the area of the brain that enables us to extinguish a learned fear develops later than the area that elicits a fear response.<sup>7</sup> So, young children respond to and process emotional experiences and traumatic events in ways that are very different from older children and adults. Children understand, manage, think, and talk about their experiences differently at different ages. These developmental differences are important to understanding the behavioral and emotional disturbances that young children may experience, how the problems are manifested, and how they can be ameliorated.

Third, in early childhood, it can be difficult to distinguish short-lived variations in behavior from persistent problems, or typical differences in maturation from significant developmental delays.<sup>8</sup> Although many enduring mental health problems have their origins in the early years, some behavioral or emotional difficulties in children and even adolescents can be transient.<sup>9,10,11</sup> Thus, while a range of strategies is available to treat or prevent difficulties, diagnosis in early childhood can be even more difficult than it is in adults. Caution is needed when evaluating an infant or young child for potential indicators of emotional or behavioral problems and matching those indicators to appropriate treatments.

## What Science Tells Us

**Toxic stress early in life can damage the architecture of the developing brain and increase the likelihood of significant mental health problems that may emerge either early or years later.**<sup>3,12,13,14,15,16,17,18</sup> Life circumstances associated with family stress in the absence of supportive adult relationships, such as persistent poverty, threatening neighborhoods, and very poor child care conditions, elevate the risk of serious mental health problems and undermine healthy functioning in the early years.<sup>19</sup> Early childhood adversity of this kind also increases the risk of adult physical and mental health problems because of its enduring effects on the developing brain and other maturing organs.<sup>20</sup> Young children who experience recurrent abuse or chronic

neglect, regularly witness domestic violence, or live in homes burdened by parental mental health or substance abuse problems are particularly vulnerable. Relationship-based circumstances contributing to early emotional difficulties, such as maternal depression, also have well-documented adverse effects on developing brain function in the early years.<sup>21,22,23,24,25</sup>

Toxic stress can lead to persistent activation of biological stress response systems. This produces abnormal levels of stress hormones that have the capacity to damage brain architecture if they do not normalize. In the absence of the buffering protection of supportive relationships, these atypical hormone levels interfere with the development of healthy brain architecture. This

poses a serious threat to young children, not only because it undermines their emotional well-being, but also because it can impair a wider range of developmental outcomes, including early learning, school readiness, and later academic achievement.<sup>12,18,26,27,28,29,30,31,32</sup>

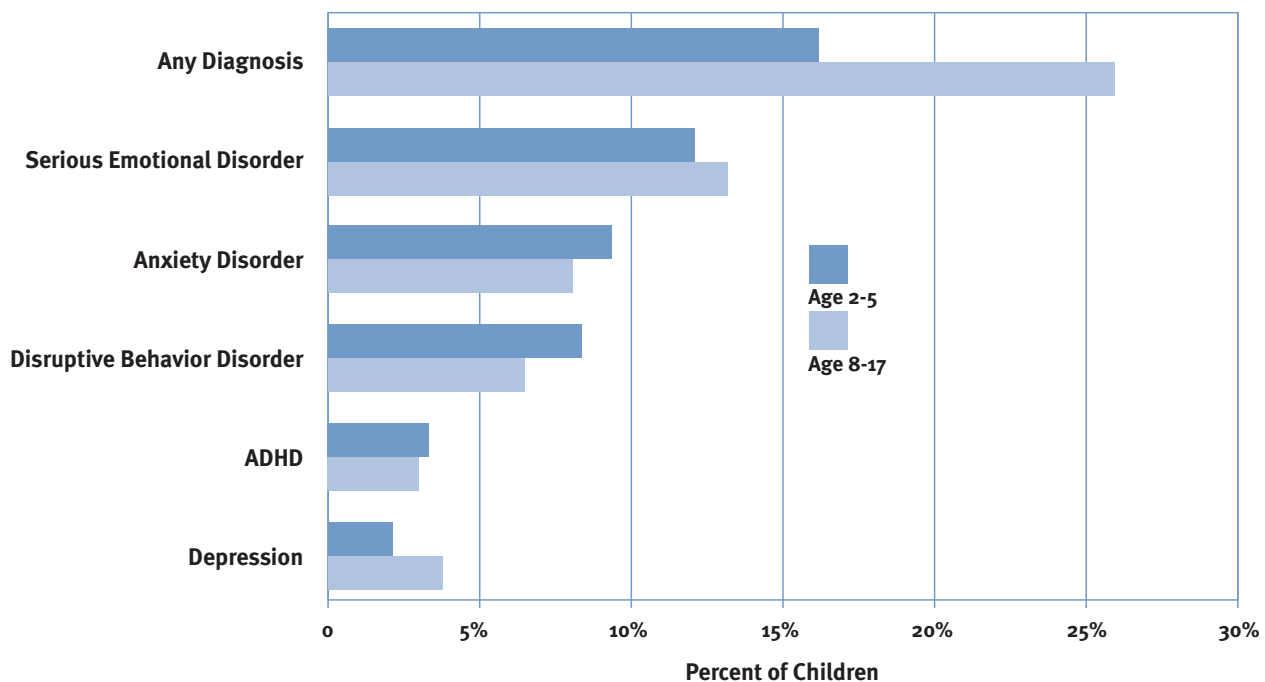
**Much impairment in mental health arises as a result of the interaction between a child's genetic predisposition and his or her exposure to significant environmental adversity.**

Not all stressful experiences are damaging, and those that are positive, like an initial fear of pets, can strengthen adaptive responses to short-lived stress for a lifetime. However, exposure to early traumatic or abusive experiences can be toxic to developing brain circuitry and can combine with differences in individual behavioral styles (which child development researchers call “temperament”) to influence the severity of the long-term mental health consequences. A young child with a genetic tendency to fearfulness, for example, is more likely to develop anxiety or depression

than a child without that predisposition. This is particularly powerful in the context of harsh, inconsistent relationships and experiences, such as those associated with deep poverty, poor-quality child care in the family's community, or a depressed mother. In other words, early adversity acts as the “signature” that releases a child's genetic predisposition for anxiety, building a brain architecture that responds to lower levels of stress with excessive fear and anxiety, leading to lifelong consequences for mental health.<sup>33</sup>

This nature-nurture interaction is illustrated in studies of behavioral inhibition, an early-emerging pattern of fearful, withdrawn behavior that is a risk factor for later anxiety disorders.<sup>6,34</sup> In a recent report, behavioral inhibition at age 7 was related to the interaction of two earlier influences: (a) a gene that is associated with anxiety and fear in adults, and (b) the mother's report that she lacked social support from others, which may be associated with toxic stress for her children. Put another way, the interaction between a genetic tendency toward anxiety and

### Mental Health Problems Can Occur Across Childhood



Source: Egger & Angold (2006)<sup>1</sup>

the experience of early life stresses best predicted which children remained behaviorally inhibited at age 7.<sup>35,36</sup> Such behavioral inhibition may be related to the development of more serious problems later in life, as additional research shows that children who are behaviorally inhibited show different patterns of activation of brain regions related to emotional withdrawal and fear compared with children whose behavior is more typical.<sup>37,38,39,40</sup>

**The behaviors and characteristics associated with mental health problems in the earliest years of life are often different from those seen in older children and adults with psychological difficulties.**<sup>41,42,43</sup> Young children’s brains are not fully developed, and they do not respond to stressful events the way adults do. A toddler who is coping with trauma or the loss of a loved one

## **If young children are not provided appropriate help, emotional difficulties that emerge early in life can become more serious disorders over time.**

acts differently from a traumatized adolescent because of different psychological capabilities, emotional needs, and social experiences at different ages. Young children manifest the symptoms of depression or post-traumatic stress disorder (PTSD) differently than young adults. Some mental health problems, such as attachment-related disorders (i.e., profound disturbances in close relationships with caregivers), are specific to early childhood. Thus, although adult diagnostic approaches can provide some guidance for understanding the kinds of problems that younger children may experience, new approaches to assessment and diagnosis based on the unique developmental needs and characteristics of young children are extremely important.<sup>43,44</sup>

Over the past few years, researchers have validated diagnostic criteria specific to young children that are useful in identifying early forms of depression, post-traumatic stress disorder, autism, disruptive behavior disorders, anxiety disorders, and attention deficit/hyperactivity disorder.<sup>1,45,46,47,48,49,50,51</sup> Despite these advances, however, the accurate identification of serious mental health disorders during the first three

to four years of life remains a challenging task. Consequently, it is unwise to assume that early problems can be classified simply into one category within a diagnostic system. Indeed, young children, like older children and adults, frequently experience multiple problems (known as “co-morbidity”). This is illustrated by the co-occurrence of depression with oppositional-defiant disorders in early childhood, or the increased prevalence of depression or other emotional problems in children with autism.<sup>1,52,53,54</sup>

**If young children are not provided appropriate help, emotional difficulties that emerge early in life can become more serious disorders over time.**<sup>55,56,57</sup> Early prevention strategies and efforts to identify and treat emergent mental health concerns are likely to be more psychologically beneficial and cost-effective than trying to treat emotional difficulties after they become more serious at a later age. This field urgently needs treatment strategies that are age-appropriate, support the development of healthy relationships, and are consistent with scientific knowledge about early psychological development. Promising approaches for some early mental health challenges are well-described in the research literature,<sup>58,59,60</sup> yet they are not widely available. Other problems have been less well-studied in very young children. Nevertheless, many disorders can be prevented before they begin by providing access to developmentally appropriate, high-quality early care and education. Systems of support are particularly important, as they assist parents and caregivers in providing warm and secure relationships and in detecting emotional problems before they become more resistant to change. Public policies are also essential to help ameliorate the physical, social, and economic conditions that cause some families to struggle.

**Some individuals demonstrate remarkable capacity to overcome the severe challenges of early, persistent maltreatment, trauma, and emotional harm. Yet, there are limits to the capacity of young children to recover psychologically from such adversity.**<sup>61,62,63,64</sup> Even under circumstances in which children have been removed from traumatizing conditions and placed in exceptionally nurturing homes, developmental improvements are often

accompanied by continuing problems in self-regulation, emotional adaptability, relating to others, and self-understanding. There also is research indicating that long-term physical health can be affected by early life adversity. This is seen in the form of increased risk of heart disease, diabetes, hypertension, and other physical ailments, as toxic stress can literally be “built” into the body.<sup>5</sup> When children overcome these burdens, they have typically been the beneficiaries of exceptional efforts on the part of supportive adults. These findings underscore the importance of prevention and timely intervention in circumstances that put young children at severe psychological risk.

**Serious developmental disabilities can also be associated with significant mental health impairments that are affected by experience and amenable to intervention.** Neurodevelopmental disorders, such as autism, fragile X syndrome, and Down syndrome, for example, are the result of strong genetic influences. Nevertheless, genetics is only part of the story. Although disorders such as Down syndrome have a specific genetic cause, mental health outcomes for these children are also affected by the quality of care and support they receive, compared with typically developing children. The possibility of significant improvement in quality of life, as well as in both cognitive and social functioning, as a result of prompt intervention provides a strong argument for the early detection and treatment of these developmental disorders. This is becoming increasingly apparent with respect to early intervention for autism.<sup>65</sup>

**It is essential to treat young children’s mental health problems within the context of their**

**family, home, and community environments.** The powerful influence of a child’s early environment of relationships illustrates how much the emotional well-being of young children is directly tied to the emotional functioning of their caregivers and the families in which they live.<sup>66</sup> When these relationships are abusive, threatening, chronically neglectful, or otherwise psychologically harmful, they are a potent risk factor for the development of early mental health problems. In contrast, when positive “serve and return” relationships develop, which occur through reliably responsive and supportive interactions, they can actually buffer young children from the adverse effects of other stressors.<sup>16,61,67,68,69</sup> Addressing the sources of toxic stress affecting a child requires relieving the stressors on his or her family in order to ensure that this broader environment of relationships can be maximally supportive.

**For many parents and providers of child health services and early care and education who are faced with children who present problematic behavior, the question of “when to worry” is paramount, yet little evidence exists to answer that question definitively in most circumstances.** Although early mental health problems can foreshadow enduring disorders, many difficulties are transient and disappear with appropriate management and further maturation.<sup>9,10,11</sup> Generally speaking, clinical experts advise greater concern when children exhibit constellations of problems (e.g., persistent irritability or eating and sleeping problems, combined with defiance) that lead to significant impairments in age-appropriate behavioral skills and relationships.

## Addressing Common Misconceptions

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AS THE PUBLIC DEVOTES MORE ATTENTION TO the relation between early brain development and the emotional well-being of young children, the risk of misinformation and misleading or irresponsible messages also grows. Within this context, it is essential that we distinguish scientific fact from erroneous fiction. The following two misconceptions are particularly important to set straight.

**Contrary to popular belief, young children can and do experience serious mental health problems that are comparable in severity to what we observe in older children and adults, and they can have lasting effects.** Although young children are not as psychologically sophisticated as adults, research on early childhood development shows that they are capable of experiencing peaks of joy and elation as well as depths of

grief, sadness, hopelessness, intense anger, and rage. Contrary to traditional views, highly negative emotional experiences in early childhood are not “forgotten”; they are built into the architecture of the developing brain and can have a sustained impact that extends well into the adult years, especially when they are severe, persistent, and uncontrollable. Adverse community and family environments can have a similarly enduring emotional impact on young children when they are experienced as toxic stress and not buffered by supportive relationships.

**Contrary to popular belief, young children living in highly threatening environments can be**

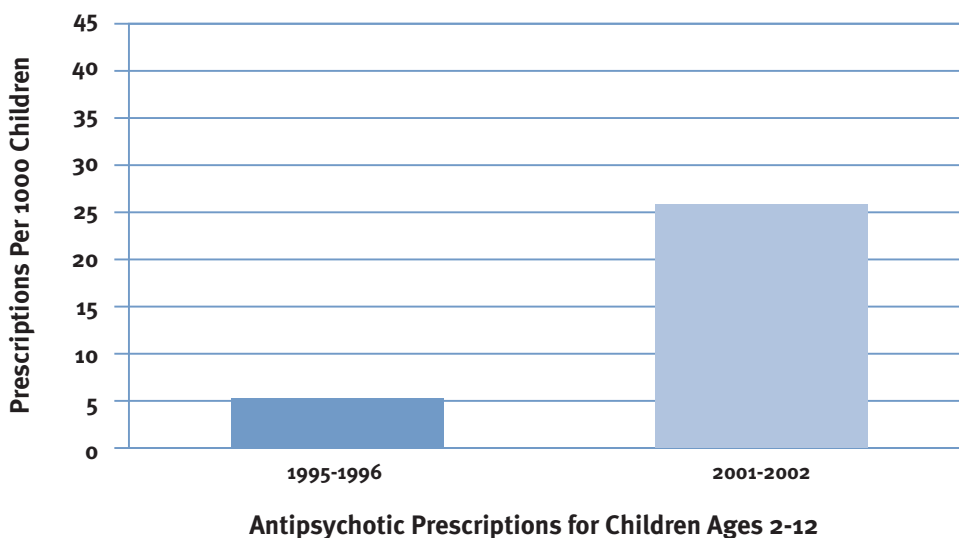
**protected from serious emotional or behavioral consequences.** Although such conditions increase their risk for serious mental health problems, learning impairments, and long-term physical illnesses, children who experience serious threats to their psychological health, such as those who are physically abused, chronically neglected, or emotionally traumatized, do not inevitably develop significant mental illnesses. These children can be protected through the early identification of their emotional needs and the provision of appropriate assistance in the context of stable, nurturing relationships with supportive and skilled caregivers as well as through preventive mental health services.<sup>62,64,70</sup>

## The Science-Policy Gap

THE FACT THAT YOUNG CHILDREN CAN PRESENT challenging behaviors is hardly news to the adults who care for them. It is less well-known that some serious behavior problems in the early years of life may be the first signs of potentially lifelong mental health disorders that are preventable

if treated at a young age. Very young children can experience significant impairments in their mental health that are embedded in the developing architecture of their brains and may have lifelong consequences, according to a rich and growing science base. Yet, relatively little

### Significant Trend Toward Increased Antipsychotic Prescriptions



Source: Cooper et al. (2006)<sup>79</sup>



attention has been paid to the formulation and implementation of strategies to identify children who are at risk for such problems and to provide supports for them and their families that will increase the probability of more favorable outcomes. This gap between what we know and what we do is illustrated by the following three examples.

**Professionals who are regularly involved in the lives of infants, toddlers, and preschoolers often lack the knowledge and skills that would help them identify the early signs of mental health problems as well as fully understand the consequences of family difficulties and parent mental health problems for young children’s development.** These professionals include child care providers and preschool teachers (who are often the first people outside the family to identify a child who has serious emotional difficulties), physicians and other health care providers (who often lack a sophisticated understanding of psychological development and early mental health), paraprofessional home visitors, program administrators and personnel in social service, child protection, early intervention, and welfare agencies, among others who regularly serve families with young children.

**In most communities, mental health services for young children and their families are often limited, of uneven quality, and difficult to access, and there are relatively few well-trained professionals with expertise in early childhood mental health.** Central to this problem is the need

to close the gap between the large numbers of young children exhibiting emotional difficulties and/or problematic behavior that cannot be managed adequately by their parents and the limited number of personnel who are skilled in effective intervention approaches that are uniquely suited to this age group.

**There has been a dramatic increase in the use of psychoactive drugs for treating young children with behavioral or mental health problems, despite the fact that neither the efficacy nor safety of many of these medications has been studied specifically in children at these early ages.**<sup>45</sup>

A recent report from the National Survey of Children’s Health, for example, reported that children ages 4 to 8 were more likely to be taking medication for attention deficit/hyperactivity disorder than older children and adolescents.<sup>71</sup> Of even greater concern, some studies have reported increasing numbers of prescriptions for stimulant medications and antidepressants to treat children as young as age 3.<sup>72</sup> In most cases, these medications for young children are prescribed “off label,” which means that they have only been approved for treating adults and that there are no scientific data on their immediate or long-term effects on child behavior or early brain development.<sup>45</sup> Until the relevant clinical studies have been completed with the appropriate populations of young children, the use of such medications must be viewed as experimental and their safety and effectiveness as unknown.<sup>73,74,75,76</sup>

## Implications for Policy and Programs

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THE SCIENCE OF EARLY CHILDHOOD DEVELOPMENT, including knowledge about the extent to which serious emotional problems are embedded in the architecture of the developing brain, is sufficiently mature to support a number of evidence-based implications for those who develop and implement policies that affect the health and well-being of young children. Both public and private actions can prevent the kinds of adverse circumstances that are capable of derailing healthy development, as well as increase the likelihood that effective supports and appropriate therapeutic interventions (where

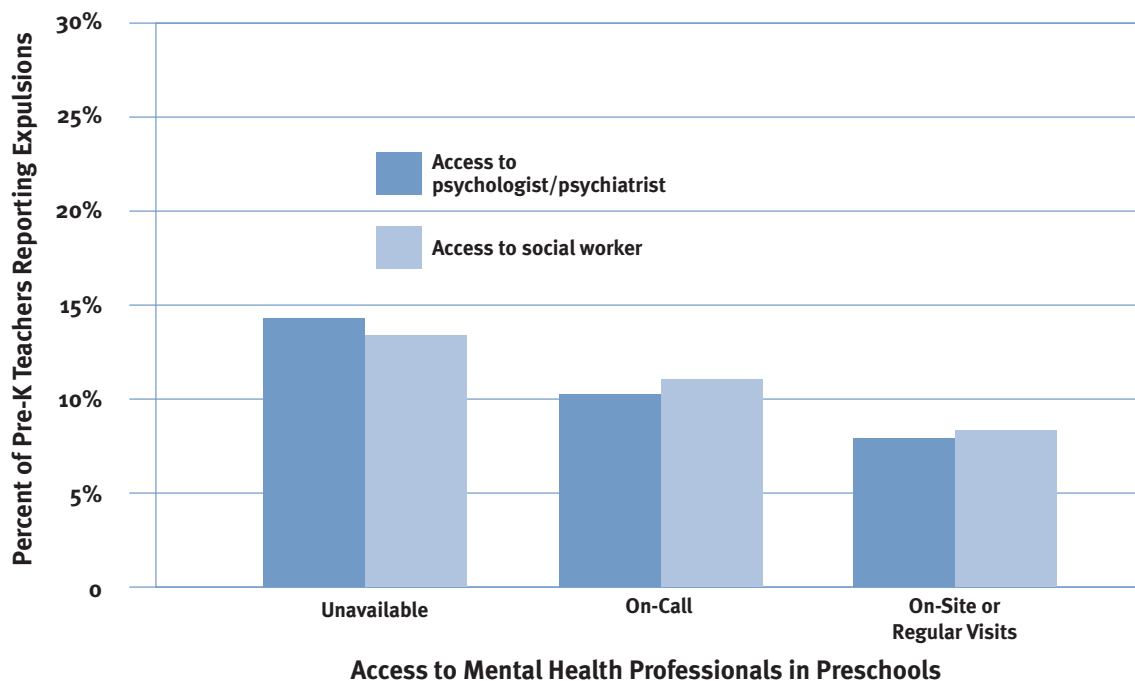
needed) will reduce the long-term consequences of early threats to a child’s mental health. The following points are particularly worthy of thoughtful consideration.

**Because young children’s emotional well-being is tied so closely to the mental health of their parents and non-family caregivers, the emotional and behavioral needs of infants, toddlers, and preschoolers are best met through coordinated services that focus on their full environment of relationships.** Multigenerational, family-centered approaches offer the most promising

models for preventing and treating mental health problems in young children. These strategies range from providing information and support to address problematic child behavior to initiating therapeutic interventions to attend to significant parent mental health or substance abuse problems, end domestic violence, or help families to cope with the burdens of persistent poverty. Indeed, sometimes the best intervention strategy for young children with serious behavioral or emotional problems is to focus directly on the primary needs of those who care for them. However, most approaches to funding mental health services are client-specific rather than family-focused, and most programs aimed at such “adult” problems as poverty, domestic violence, substance abuse, or depression do not take into consideration the emotional well-being of the children affected by them. More flexible approaches to funding family-based preventive and therapeutic mental health services are needed.

**Therapeutic help for a young child with emotional or behavioral problems can be provided through a combination of home- and center-based services involving parents, extended family members, home visitors, providers of early care and education, and/or mental health professionals.** The settings, partnerships, and targets of therapeutic assistance for young children with mental health needs are much more diverse than those for adults, because their emotional well-being is linked tightly to the quality of their relationships with the important people in their lives. Effective intervention often requires the coordination of services from multiple sources that do not relate easily. These might include early care and education, social service and welfare departments, health care, schools, child welfare agencies, and early intervention programs, to name a few. Reducing barriers to greater coordination often requires attention to a tangle of administrative obstacles. One example would be a change in reimbursement

### Preschool Expulsions Decrease with Access to Mental Health Professionals



Source: Gilliam (2005)<sup>78</sup>

regulations to allow “mental health funds” to be used to pay for specialized child care for a youngster with emotional and behavioral problems, rather than restricting the funds to only “mental health programs.”

**Mental health services for adults who are parents of young children would have broader impact if they routinely included attention to the needs of the children as well.** Because of the close association between young children’s emotional well-being and the emotional health and functioning of their caregivers,<sup>77</sup> therapeutic assistance to a parent ought to include an automatic assessment of any young children in the family to see how they are experiencing the emotional consequences of their parent’s problems. For example, any physician treating a depressed mother ought to understand the consequences of that diagnosis for her young children and therefore assure that they receive timely examinations and appropriate intervention, as needed.

**Physicians and providers of early care and education would be better equipped to understand and manage the behavioral problems of young children if they had more intensive professional training focused on this area and easier access to child mental health professionals when needed.** Caregivers, teachers, and physicians are often the first to recognize serious emotional difficulties in a child who is in their care, yet their training may include little information regarding an up-to-date understanding of child mental health. The availability of a rich scientific research base provides an opportunity to improve relevant curriculum and training programs. It also is clear that on-site assistance from early childhood mental health specialists can be particularly helpful in providing guidance about how best to respond to the needs of the children, their parents, and providers of early care and education. Preschool teachers with access to mental health consultation, for example, are less likely to expel children with behavioral problems from their programs.<sup>78</sup> Some states have made progress in providing funds for early childhood mental health consultations in early child care settings, often through the coordination of diverse funding streams. Broader attention to early childhood mental health requires attention to the quality of out-of-home care that children typically experience in the early years.

**Cultural differences in attitudes and beliefs about mental health need to be recognized and included as factors when developing programs for prevention and intervention.** The mental health needs of young children in families from different cultural and ethnic groups would benefit considerably from enhanced practitioner training and flexible service models that incorporate greater content representing a broad variety of populations. Cultural differences include how children are taught to interpret and express their experiences of fear, anger, and shame; the relative reinforcement given to individual achievement versus interdependent behavior; parent and caregiver attitudes about

**The emotional and behavioral needs of infants, toddlers, and preschoolers are best met through coordinated services that focus on their full environment of relationships.**

mental health and mental illness; and acceptance of therapeutic intervention for very young children by non-family members, among many other concerns. The shifting demographics that are increasing the diversity of the early childhood population in the United States make this a particularly compelling priority for attention. Finally, it is important to understand individual differences within cultural groups related to assimilation of immigrant groups across generations and changes in cultural beliefs and practices over time.

**Better investment and coordination of resources to support mental health services for young children will provide a more stable and efficient vehicle for assuring access to effective prevention and treatment programs.** Consistent with both current scientific knowledge (i.e., the physiological interrelations among the physical, cognitive, social and emotional dimensions of well-being in young children) and federal legislative support for parity in coverage of physical and mental health care, access to and quality of early childhood mental health services need to improve. Integrating efforts more effectively into a wide range of existing, effective programs is

but one solution. Mental health services covered by the Early and Periodic Screening, Diagnosis, and Treatment (EPSDT) program, Children's Health Insurance Program (CHIP), early intervention (IDEA Part C) or maternal and child health programs should better coordinate with related programs such as child welfare, child care, Early Head Start and Head Start, home visiting, and other programs and settings.

FUNDING COORDINATION IS JUST ONE WAY WE could work to improve the environment of relationships and experiences that form the contexts for children's development. Innovative states and communities have been able to design strategies and programs to support such environments, and they have shown significant progress toward solving some of these very difficult problems associated with children's mental health. Our task is to help bring such innovations to scale for children and families in need.

## References

1. Egger, H. L., & Angold, A. (2006). Common emotional and behavioral disorders in preschool children: Presentation, nosology, and epidemiology. *Journal of Child Psychology and Psychiatry*, 47(3-4), 313-337.
2. Teisl, M., & Cicchetti, D. (2008). Physical abuse, cognitive and emotional processes, and aggressive/disruptive behavior problems. *Social Development*, 17(1), 1-23.
3. Gunnar, M.R. (2007). Stress effects on the developing brain. In D. Romer, E.F. Walker (Eds.) *Adolescent psychopathology and the developing brain: Integrating brain and prevention science*. (pp. 127-147). New York: Oxford University Press.
4. Edwards, V. J., Holden, G. W., Felitti, V. J., & Anda, R.F. (2003). Relationship between multiple forms of child maltreatment and adult mental health in community respondents: Results from the Adverse Childhood Experiences Study. *The American Journal of Psychiatry*, 160(8), 1453-1460.
5. Felitti, V. J., Anda, R. F., Nordenberg, D., Williamson, D. F., Spitz, A. M., Edwards, V., Koss, M. P., & Marks, J. S. (1998). Relationship of childhood abuse and household dysfunction to many of the leading causes of death in adults: The Adverse Childhood Experiences (ACE) Study. *American Journal of Preventive Medicine*, 14(4), 245-258.
6. Rubin, K., Bukowski, W., & Parker, J. (2006). Peer interactions, relationships, and groups. In W. Damon & R. M. Lerner (Eds.), *Handbook of child psychology (6th Edition): Vol. 3: Social, emotional, and personality development* (N. Eisenberg, Vol. Ed.) (pp. 571-645). New York: John Wiley & Sons.
7. National Scientific Council on the Developing Child. (2010). *Persistent fear and anxiety can affect young children's learning and development: Working Paper 9*. <http://www.developingchild.net>.
8. Shonkoff, J. P., & Phillips, D. A. (Eds.) (2000). *From neurons to neighborhoods: The science of early childhood development*. Washington, DC: National Academy Press.
9. Peterson, B. S., Pine, D. S., Cohen, P., & Brook, J. S. (2001). Prospective, longitudinal study of tic, obsessive-compulsive, and attention-deficit/hyperactivity disorders in an epidemiological sample. *Journal of the American Academy of Child and Adolescent Psychiatry*, 40(6), 685-695.
10. Pine, D. S., Cohen, P., Johnson, J. G., & Brook, J. S. (2002). Adolescent life events as predictors of adult depression. *Journal of Affective Disorders*, 68(1), 49-57.
11. Pine, D. S., Cohen, P., Gurley, D., Brook, J., & Ma, Y. (1998). The risk for early-adult anxiety and depressive disorders in adolescents with anxiety and depressive disorders. *Archives of General Psychiatry*, 55(1), 56-64.
12. Carrion, V., Weems, C., Ray, R., Glaser, B., Hessel, D., & Reiss, A. (2002). Diurnal salivary cortisol in pediatric posttraumatic stress disorder. *Biological Psychiatry*, 51(7), 575-582.
13. De Bellis, M., Baum, A., Birmaher, B., Keshavan, M., Eccard, C., Boring, A., Jenkins, F., & Ryan, N. (1999). A.E. Bennett Research Award: Developmental traumatology, Part I: Biological stress systems. *Biological Psychiatry*, 45(10), 1259-1270.
14. De Bellis, M., Keshavan, M., Clark, D., Casey, B., Giedd, J., Boring, A., Frustaci, K., & Ryan, N. (1999). A.E. Bennett Research Award: Developmental traumatology, Part II: Brain development. *Biological Psychiatry*, 45(10), 1271-1284.
15. Glaser, D. (2000). Child abuse and neglect and the brain—A review. *Journal of Child Psychology and Psychiatry and Allied Disciplines*, 41(1), 97-116.
16. Gunnar, M.R., Morison, S.J., Chisholm, K., & Schuder, M. (2001). Salivary cortisol levels in children adopted from Romanian orphanages. *Development and Psychopathology*, 13(3), 611-628.
17. Kaufman, J., & Charney, D. (2001). Effects of early stress on brain structure and function: Implications for understanding the relationship between child maltreatment and depression. *Development and Psychopathology*, 13(3), 451-471.
18. National Scientific Council on the Developing Child. (2005). *Excessive stress disrupts the architecture of the developing brain: Working Paper 3*. <http://www.developingchild.net>.
19. Brooks-Gunn, J., & Duncan, G.J. (1997). The effects of poverty on children. *The Future of Children*, 7(2), 55-71.
20. Danese, A., Pariante, C. M., Caspi, A., Taylor, A., & Poulton, R. (2007). Childhood maltreatment predicts adult inflammation in a life-course study. *Proceedings of the National Academy of Sciences of the United States of America*, 104(4), 1319-1324.
21. Danese, A., Moffitt, T. E., Pariante, C. M., Ambler, A., Poulton, R., & Caspi, A. (2008). Elevated inflammation levels in depressed adults with a history of childhood maltreatment. *Archives of General Psychiatry*, 65(4), 409-416.

22. Dawson, G., Ashman, S., Panagiotides, H., Hessl, D., Self, J., Yamada, E., & Embry, L. (2003). Preschool outcomes of children of depressed mothers: Role of maternal behavior, contextual risk, and children's brain activity. *Child Development, 74*(4), 1158-1175.
23. Evans, G. W., Gonnella, C., Marcynyszyn, L. A., Gentile, L., & Salpekar, N. (2005). The role of chaos in poverty and children's socioemotional adjustment. *Psychological Science, 16*(7), 560-565.
24. Evans, G. W., Kim, P., Ting, A. H., Tessler, H. B., & Shannis, D. (2007). Cumulative risk, maternal responsiveness, and allostatic load among young adolescents. *Developmental Psychology, 43*(2), 341-351.
25. Goodman, S., & Gotlib, I. (1999). Risk for psychopathology in the children of depressed mothers: A developmental model for understanding mechanisms of transmission. *Psychological Review, 106*(3), 458-490.
26. Dawson, G., & Ashman, S.B. (2000). On the origins of a vulnerability to depression: The influence of the early social environment on the development of psychobiological systems related to risk for affective disorder. In C.A. Nelson (Ed.), *The effects of early adversity on neurobehavioral development: Minnesota Symposia on Child Psychology: Vol. 31*. Mahwah, NJ: Erlbaum Associates.
27. Luby, J., Belden, A., & Spitznagel, E. (2006). Risk factors for preschool depression: The mediating role of early stressful life events. *Journal of Child Psychology and Psychiatry and Allied Disciplines, 47*(12), 1292-1298.
28. Osofsky, J. (2004). Community outreach for children exposed to violence. *Infant Mental Health Journal, 25*(5), 478-487.
29. Rubin, K., Burgess, K., Dwyer, K., & Hastings, P. (2003). Predicting preschoolers' externalizing behaviors from toddler temperament, conflict, and maternal negativity. *Developmental Psychology, 39*(1), 164-176.
30. Scheeringa, M., & Zeanah, C. (1995). Symptom expression and trauma variables in children under 48 months of age. *Infant Mental Health Journal, 16*(4), 259-270.
31. Shaw, D., Owens, E., Giovannelli, J., & Winslow, E. (2001). Infant and toddler pathways leading to early externalizing disorders. *Journal of the American Academy of Child and Adolescent Psychiatry, 40*(1), 36-43.
32. Vasey, M., & Dadds, M., Eds. (2001). *The developmental psychopathology of anxiety*. New York: Oxford University Press.
33. National Scientific Council on the Developing Child. (2010). *Early experiences can alter gene expression and affect long-term development: Working Paper 10*. <http://www.developingchild.net>.
34. Tincas, I., Benga, O., & Fox, N. (2006). Temperamental predictors of anxiety disorders. *Cognitie, Creier, Comportament (Cognition, Brain, Behavior), 10*(4), 489-515.
35. Fox, N., Hane, A., & Pine, D. (2007). Plasticity for affective neurocircuitry: How the environment affects gene expression. *Current Directions in Psychological Science, 16*(1), 1-5.
36. Fox, N., Nichols, K., Henderson, H., Rubin, K., Schmidt, L., Hamer, D., Ernst, M., & Pine, D. (2005). Evidence for a gene-environment interaction in predicting behavioral inhibition in middle childhood. *Psychological Science, 16*(12), 921-926.
37. Fox, N., Henderson, H., Marshall, P., Nichols, K., & Ghera, M. (2005). Behavioral inhibition: Linking biology and behavior within a developmental framework. *Annual Review of Psychology, 56*, 235-262.
38. Fox, N., Henderson, H., Rubin, K., Calkins, S., & Schmidt, L. (2001). Continuity and discontinuity of behavioral inhibition and exuberance: Psychophysiological and behavioral influences across the first four years of life. *Child Development, 72*(1), 1-21.
39. Pine, D. S. (2007). Research review: A neuroscience framework for pediatric anxiety disorders. *Journal of Child Psychology and Psychiatry, 48*(7), 631-648.
40. Schwartz, C., Wright, C., Shin, L., Kagan, J., & Rauch, S. (2003). Inhibited and uninhibited infants "grown up": Adult amygdalar response to novelty. *Science, 300*(5627), 1952-1953.
41. Doll, B., Brehm, K., Zucker, S., Deaver-Langevin, J., Griffin, J., & Hickman, A. (2000). Contrasting procedures for empirical support of traditional and population-based mental health services. *Psychology in the Schools, 37*(5), 431-442.
42. Lieberman, A.F., Barnard, K.E., Wieder, S. (2004) Diagnosing infants, toddlers, and preschoolers: The Zero to Three diagnostic classification of early mental health disorders. In R. DelCarmen-Wiggins, & A. Carter (Eds.), *Handbook of infant, toddler, and preschool mental health assessment* (pp. 141-160). New York: Oxford University Press.
43. ZERO TO THREE: National Center for Infants, Toddlers, and Families. (2005). Diagnostic classification of mental health and developmental disorders of infancy and early childhood (DC:0-3R). Washington, DC: Author.
44. American Academy of Child & Adolescent Psychiatry (Task Force on Research Diagnostic Criteria: Infancy and Preschool) (2003). Research diagnostic criteria for infants and preschool children: The process and empirical support. *Journal of the American Academy of Child & Adolescent Psychiatry, 42*(12), 1504-1512.
45. Gleason, M. M., Egger, H. L., Emslie, G. J., Greenhill, L. L., Kowatch, R. A., Lieberman, A. F., Luby, J. L., Owens, J., Scahill, L. D., Scheeringa, M. S., Stafford, B., Wise, B., & Zeanah, C. H. (2007). Psychopharmacological treatment for very young children: Contexts and guidelines. *Journal of the American Academy of Child and Adolescent Psychiatry, 46*(12), 1532-1572.
46. Keenan, K., & Wakschlag, L. S. (2002). Can a valid diagnosis of disruptive behavior disorder be made in preschool children? *American Journal of Psychiatry, 159*(3), 351-358.
47. Luby, J. L. (Ed.) (2006). *Handbook of preschool mental health: Development, disorders, and treatment*. New York: Guilford Press.
48. Luby, J. L., Mrakotsky, C., Heffelfinger, A., Brown, K., Hessler, M., Spitznagel, E. (2003). Modification of DSM-IV criteria for depressed preschool children. *American Journal of Psychiatry, 160*(6), 1169-1172.
49. Lord, C., Risi, S., DiLavore, P. S., Schulman, C., Thurm, A., & Pickles, A. (2006). Autism from 2 to 9 years of age. *Archives of General Psychiatry, 63*(6), 694-701.
50. Scheeringa, M., Peebles, C. D., Cook, C. A., & Zeanah, C. H. (2001). Toward establishing procedural, criterion, and discriminant validity for PTSD in early childhood. *Journal of the American Academy of Child and Adolescent Psychiatry, 40*(1), 52-60.
51. Scheeringa, M., Zeanah, C. H., Myers, L., & Putnam, F. (2005). Predictive validity in a prospective follow-up of PTSD in preschool children. *Journal of the American Academy of Child and Adolescent Psychiatry, 44*(9), 899-906.
52. Ghaziuddin, M., Ghaziuddin, N., & Greden, J. (2002). Depression in persons with autism: Implications

- for research and clinical care. *Journal of Autism and Developmental Disorders*, 32(4), 299-306.
53. Ghaziuddin, M., & Greden, J. (1998). Depression in children with autism/pervasive developmental disorders: A case-control family history study. *Journal of Autism and Developmental Disorders*, 28(2), 111-115.
  54. Kim, J.A., Szatmari, P., Bryson, S.E., Streiner, D.L., & Wilson, F.J. (2000). The prevalence of anxiety and mood problems among children with autism and Asperger syndrome. *Autism*, 4(2), 117-132.
  55. Keenan, K., Shaw, D., Delliquadri, E., Giovannelli, J., & Walsh, B. (1998). Evidence for the continuity of early problem behaviors: Application of a developmental model. *Journal of Abnormal Child Psychology*, 26(6), 441-452.
  56. Shaw, D.S., Gilliom, M., Ingoldsby, E.M. & Nagin, D.S. (2003). Trajectories leading to school-age conduct problems. *Developmental Psychology*, 39(2), 189-200.
  57. Suveg, C., Southam-Gerow, M.A., Goodman, K.L. & Kendall, P.C. (2007). The role of emotion theory and research in child therapy development. *Clinical Psychology: Science and Practice*, 14(4), 358-371.
  58. Lieberman, A. F., Ippen, C. G., & Van Horn, P. (2006). Child-parent psychotherapy: 6-month follow-up of a randomized controlled trial. *Journal of the American Academy of Child and Adolescent Psychiatry*, 45(8), 913-918.
  59. Peterson, C.A., Luze, G.J., Eshbaugh, E.M., Jeon, H. & Kantz, K.R. (2007). Enhancing parent-child interactions through home visiting: Promising practice or unfulfilled promise? *Journal of Early Intervention*, 29(2), 119-135.
  60. Sameroff, A.J., McDonough, S.C., & Rosenblum, K.L. (Eds.) (2004). *Treating parent-infant relationship problems: Strategies for intervention*. New York: Guilford Press.
  61. Graham-Berman, S.A., & Hughes, H.M. (2003). Intervention for children exposed to interparental violence (IPV): Assessments of needs and research priorities. *Clinical Child and Family Psychology Review*, 6(3), 189-204.
  62. Judge, S. (2004). The impact of early institutionalization on child and family outcomes. *Adoption Quarterly*, 7(3), 31-48.
  63. Lowenthal, B. (2001). *Abuse and neglect: The educator's guide to the identification and prevention of child maltreatment*. Baltimore, MD: Paul H. Brookes Publishing.
  64. Watts-English, T., Fortson, B.L., Gibler, N., Hooper, S.R. & De Bellis, M.D. (2006). The psychobiology of maltreatment in childhood. *Journal of Social Issues*, 62(4), 717-736.
  65. Faja, S., & Dawson, G. (2006). Early intervention for autism. In J. Luby (Ed.) *Handbook of preschool mental health: Development, disorders, and treatment*. (pp. 388-416). New York: Guilford Press.
  66. National Scientific Council on the Developing Child. (2004). *Young children develop in an environment of relationships: Working Paper 1*. <http://www.developingchild.net>.
  67. Bredy, T.W., Humpartzoomian, R.A., Cain, D.P., & Meaney, M.J. (2003). Partial reversal of the effect of maternal care on cognitive function through environmental enrichment. *Neuroscience*, 118(2), 571-576.
  68. Francis, D., Diorio, J., Plotsky, P.M., & Meaney, M.J. (2002). Environmental enrichment reverses the effects of maternal separation on stress reactivity. *Journal of Neuroscience*, 22(18), 7840-7843.
  69. Sweeney, G.M. (2007). Why childhood attachment matters: Implications for personal happiness, families and public policy. In A.S. Loveless, & T.B. Holman (Eds.), *The family in the new millennium: World voices supporting the "natural" clan: Vol. 1* (332-346). Westport, CT: Praeger Publishers.
  70. Melton, G.B., Thompson, R.A., & Small, M.A. (2002). *Toward a child-centered, neighborhood-based child protection system: A report of the Consortium on Children, Families, and the Law*. Westport, CT: Praeger Publishers.
  71. Visser, S. N., Lesesne, C. A., & Perou, R. (2007). National estimates and factors associated with medication treatment for childhood attention-deficit/hyperactivity disorder. *Pediatrics*, 119, S99-106.
  72. Zito, J.M., Safer, D.J., dosReis, S., Gardner, J.F., Boles, M., & Lynch, F. (2000). Trends in the prescribing of psychotropic medications to preschoolers. *Journal of the American Medical Association*, 283(8), 1025-1030.
  73. Carlezon, W.A. Jr., & Konradi, C. (2004). Understanding the neurobiological consequences of early exposure to psychotropic drugs: Linking behavior with molecules. *Neuropharmacology*, 47, 47-60.
  74. Carlezon, W.A. Jr., Mague, S.D., & Andersen, S.L. (2003). Enduring behavioral effects of early exposure to methylphenidate in rats. *Biological Psychiatry*, 54(12), 1330-1337.
  75. Bairy, K.L., Madhyastha, S., Ashok, K.P., Bairy, I., & Malini, S. (2007). Developmental and behavioral consequences of prenatal fluoxetine. *Pharmacology*, 79(1), 1-11.
  76. Ashman, S., & Dawson, G. (2002). Maternal depression, infant psychobiological development, and risk for depression. In S.H. Goodman & I.H. Gotlib (Eds.), *Children of depressed parents: Mechanisms of risk and implications for treatment*. (pp. 37-58). Washington, DC: American Psychological Association.
  77. Lesesne, C. A., Visser, S. N., & White, C. P. (2003). Attention-deficit/hyperactivity disorder in school-aged children: Association with maternal mental health and use of health care resources. *Pediatrics*, 111(5), 1232-1237.
  78. Gilliam, W. (2005). *Prekindergarteners left behind: Expulsion rates in state prekindergarten systems*. New Haven, CT: Yale University Child Study Center.
  79. Cooper, W.O., Arbogast, P.G., Ding, H., Hickson, G.B., Fuchs, D.C., & Ray, W.A. (2006). Trends in prescribing of antipsychotic medications for US children. *Ambulatory Pediatrics*, 6(2), 79-83.



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