

Preventing and Treating Child Mental Health Problems

Alison Cuellar

Summary

Children's mental health covers a wide range of disorders. Some, such as ADHD and autism, tend to manifest themselves when children are young, while others, such as depression and addiction, are more likely to appear during the teenage years. Some respond readily to treatment or tend to improve as children grow older, while others, such as autism, are much more intractable.

Moreover, children's mental and behavioral disorders may be detected and treated in any number of settings, from a pediatrician's or psychologist's office to schools to the juvenile justice system. This heterogeneity points to one of the problems Alison Cuellar finds with the United States' approach to children's mental health. Policies and programs to help children with mental disorders are fragmented and lack coordination, funding follows idiosyncratic rules, and all of this makes prevention programs hard to deliver.

Another problem, Cuellar writes, is that treatment often focuses on controlling symptoms in the present rather than on long-term life chances. Treatments and programs that reduce children's symptoms don't necessarily lead to long-term gains in areas like education and employment; that is, even children whose treatment is deemed successful may fare more poorly in life than children without mental disorders. Thus Cuellar recommends that we evaluate whether treatment for at least some disorders should focus less on relieving symptoms and more on educational achievement and overall functioning.

Another question for which policy makers in particular need the answer is whether our resources are best spent on programs that focus on detecting and treating individual children with mental health problems or on programs that focus more broadly on preventing mental health problems among populations of children who are likely to have high rates of mental disorders—for example, minority children who live in disadvantaged neighborhoods.

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Alison Cuellar is an associate professor in the Department of Health Administration and Policy at the George Mason University College of Health and Human Services.

Mark Stable of the University of Toronto reviewed and critiqued a draft of this article.

Mental health problems take a heavy toll on children and are the dominant cause of childhood disability.¹ Studies show that child mental health problems have long-term negative consequences, including lower educational attainment, lower wages, lower likelihood of employment, and more crime.² Moreover, the negative impact of early mental health problems persists even if mental health later improves.³ Thus we should be strongly motivated to prevent, identify, and treat mental health conditions as early as possible.

What do we mean by mental health? A new, updated classification manual of mental disorders, developed by professionals in the field, recognizes a range of conditions, such as attention deficit/hyperactivity disorder (ADHD), autism spectrum disorder (ASD), depressive disorders, anxiety disorders, and disruptive, impulse-control, and conduct disorders.⁴ The classification also includes addictive disorders, learning disorders, personality disorders, and intellectual disability. In this article, I focus on the most common childhood and adolescent conditions, including both “externalizing” conditions, such as ADHD, problem behaviors, and conduct disorders, and “internalizing” conditions, such as anxiety and depression. I also address addiction disorders, which profoundly affect teens.

I consider the evidence on mental health treatment and how it stacks up with respect to societal outcomes that are important for children and teens, including education, self-harm, employment, and crime. Children receive mental health treatment in a variety of settings, frequently starting in a pediatrician’s office, but also with psychiatrists, in school or preschool, or in the child

welfare and juvenile justice systems. In fact, schools, through guidance counselors, school psychologists, and special classes, are the dominant source of care for children with mental health problems.⁵ In one study of 9- to 13-year-olds, three-quarters of children seen for a mental health problem were seen in the school system, not the general medical system. Whatever the setting, a child’s mental health treatment might include medication, some form of talk therapy, or exercises to modify thoughts or behavior. The therapy may occur together with parents, one-on-one with a provider, or in groups with other children.

Mental Health Trajectories

Table 1 shows the most common child and adolescent mental health disorders, including what percentage of children had each condition at the time of the survey and what percentage had ever had each condition. As we can see, ADHD is the most prevalent condition in children generally, and depression is the most prevalent among teens. The table also shows the prevalence of substance abuse.

To understand the context of an intervention, we consider the age of onset associated with mental illnesses. Several surveys ask adults to recall whether a condition began in childhood; surveys show that the age of onset of mental illness in children varies by condition. Anxiety disorders typically appear early in life, followed by behavior disorders, such as ADHD. Autism is typically detected around age four, but later for minority and low-income children.⁶ Disorders such as depression, substance abuse, or schizophrenia may not appear until adolescence or young adulthood.⁷

Table 1. Estimated Prevalence of Mental Disorders and Substance Abuse

Mental Health Conditions	Age Range	Estimated Prevalence “Current” (percentage)	Estimated Prevalence “Ever” (percentage)
Attention Deficit/Hyperactivity Disorder	3–17	6.8	8.9
Behavior and Conduct Problems	3–17	3.5	4.6
Autism Spectrum Disorders	3–17	1.1	1.8
Depression	3–17	2.1	3.9
Depression	12–17	6.7	12.8

Substance Abuse	Estimated Prevalence (percentage)
Alcohol Use Disorder	12–17 4.2
Illicit Drug Use Disorder	12–17 4.7
Cigarette Dependence	12–17 2.8

Sources: National Survey of Children’s Health, 2007; National Health and Nutrition Examination Survey, 2007–10; National Survey on Drug Use and Health, 2010–11.

Note: For younger children, responses are based on parent reports. Participants were asked about substance abuse over the past year for alcohol and drugs and over the past month for cigarettes.

One question of interest to policy makers is whether there have been large increases in the proportion of children with mental health conditions. This is a challenging question to answer. A review of 26 studies found no increase in the proportion of children with depression, at least not over the past 30 years.⁵ However, it does appear that the proportion of children with conduct problems has increased. Moreover, when researchers have looked at who is being treated for a mental illness—not just whether children have the condition—they have found that the proportion of children being diagnosed and treated for mental conditions is greater than ever before. For example, treatment rates for ADHD are rising rapidly, though it is not clear whether the increase results from earlier detection, increased rates of diagnosis, or the availability of new medications.⁹ In the past, ADHD was believed to manifest itself before age seven, and having symptoms before age seven was thus part of

how the condition was diagnosed. This is no longer the case.¹⁰ A number of studies have concluded that there is no clinical difference between children with ADHD symptoms that manifest earlier versus later in terms of their condition, severity, outcome, or response to treatment. Given the broadened diagnostic criteria, we can anticipate that ADHD’s prevalence will rise further.

Autism’s prevalence has also increased, partly due to greater awareness, greater availability of services, and earlier detection, but also due to changes in diagnostic criteria.¹¹ Yet these do not appear to be the only explanations. The estimated prevalence of ASD is approximately 14.7 per 1,000 children, according to the latest estimates from the U.S. Centers for Disease Control and Prevention—more than twice the rate identified in 2002.¹² The rate for males is five times as high as that for females. However, these estimates were created before the

release of the new mental health diagnostic guidelines. Under the new guidelines, several previously distinct conditions will be subsumed under ASD; for example, autistic disorder will no longer be distinguished from Asperger's disorder. Researchers found that the previous diagnoses were inconsistently applied and that they represented symptoms and behaviors along a continuum of severity, rather than distinct conditions. The new definition and criteria could lower the estimated prevalence of ASD over time. At the same time, it is still difficult for clinicians to consistently describe the severity of a child's ASD symptoms.¹³ Thus, any program or policy that seeks to serve children based on an ASD diagnosis will encompass children with a wide range of education or employment potential.

Substance use frequently begins in adolescence. The fact that teens are more likely to be impulsive, take risks, and try substances has been tied to brain development. Recent brain imaging studies have found that certain portions of the brain—including the prefrontal cortex, which controls reasoning, impulses, and risk-taking—continue to be relatively plastic until the early 20s.¹⁴ In contrast, the so-called limbic regions of the brain, which are involved in processing emotional information, are more likely to be fully developed by adolescence. This combination may open teens to greater peer influence and draw them to take risks such as self-injury, unprotected sex, and trying drugs; risky behaviors may also lead to unintentional injuries, especially in car accidents.¹⁵

Substance use among U.S. teens has declined to its lowest recorded levels. In particular, the teen smoking rate has fallen more than that of any other age group and is now at 5.6 percent, down from 13 percent in 2002.¹⁶

Similarly, the proportion of teens ages 12 to 17 who say they drink alcohol fell from 17.6 to 11.6 percent between 2002 and 2013, and the rate of teen binge drinking fell from 10.7 to 6.2 percent over the past decade (“binge drinking” means having five or more drinks on the same occasion). On the other hand, teens' marijuana use has not fallen, and the proportion of teens who think marijuana use is harmful has declined notably.¹⁷

Several studies have tried to look at how mental health conditions evolve over time, both by comparing the prevalence of conditions across age groups and by following individuals over time. The findings depend very much on the condition being studied. Starting with very young children, we see a dynamic picture. For example, in a sample of preschoolers who met criteria for a mental diagnosis at age three, half met the criteria again at age six; conversely, only about half the children who met criteria for a diagnosis at age six had met such criteria at age three. And although the prevalence of most disorders was similar at ages three and six, rates of depression and ADHD increased significantly, and rates of generalized anxiety disorder fell.¹⁸ If we look at a broader age range, we see that in the general child population, more than half of all mental health cases persist over several years.¹⁹

ADHD appears to persist for at least some children. National surveys using diagnostic interviews have found little change in ADHD rates from age 13 through age 17. Moreover, adult prevalence of ADHD is similar to that of children.²⁰ Studies that have followed children over time have found that ADHD endures from age 10 to age 21 in 69 to 79 percent of those who have it.²¹ These subjects, however, were patients referred to specialists involved in research studies, and

it's likely that they were more severe cases to begin with. In contrast, a study of individuals with ADHD in the community found persistence rates from childhood to adulthood of only 29 percent.²² Thus for some subset of children, ADHD abates.

For other conditions, the picture is mixed. In one study, conduct disorders persisted after one year in 50 percent of children, but they also showed fluctuations in symptoms from year to year.²³ When children and adolescents with depression are followed over time, studies show that 10 percent recover spontaneously within three months, and half recover within the first year.²⁴ At the same time, depression commonly recurs in teenagers. In contrast to conduct disorders and depression, autism and Asperger's appear to resolve for only a small minority of individuals; we don't know why.²⁵ In some cases, these problems worsen when children leave high school, possibly because they lose the structure that school provides and have more trouble accessing services.

Painting a complete picture of trajectories for each mental condition is complicated by comorbidities, meaning conditions that occur at the same time. These are common. Mental health conditions that may occur alongside ADHD include oppositional defiant disorder, conduct disorders, depression, and anxiety disorders.²⁶ Children with ASD have an elevated risk of ADHD, and of general behavior problems, including disruptive behaviors and aggression, anxiety, depression, and obsessive compulsive disorder.²⁷ Symptoms of hyperactivity and aggression at young ages can presage problems with delinquency, substance abuse, and antisocial behavior later on.²⁸ Further, young children with behavioral problems may also experience language delays.²⁹

In the context of treatment, another important comorbid condition is intellectual impairment. ADHD has been associated with mild intellectual and language impairments, as well as lower preacademic skills. Cognitive impairment is also associated with many autism cases. The Centers for Disease Control and Prevention reports that 31 percent of children with ASD have IQs under 70, although this proportion has fallen since 2000.³⁰ And when it begins before adulthood, marijuana use is also associated with lower IQs.³¹

Outcomes: Education and Income

Children with emotional disturbance are more likely to have academic problems and are overrepresented in the special education system. Teens with emotional disturbance have the highest school dropout rates and are among the least likely to attend college.

Despite differential patterns of onset and persistence, both ADHD and depression have been associated with lower educational attainment and lower income across a number of studies. Children with ADHD and conduct disorders tend to have poor grades, repeat grades more often, have poor test scores, and complete less schooling, while children with anxiety and depression show fewer or no effects from their condition on education outcomes.³² Adolescents with ASD have significant trouble finding employment.³³ In contrast, academic problems are considered a risk factor for substance use; that is, they come before and may contribute to drug and alcohol problems.

Outcomes: Crime

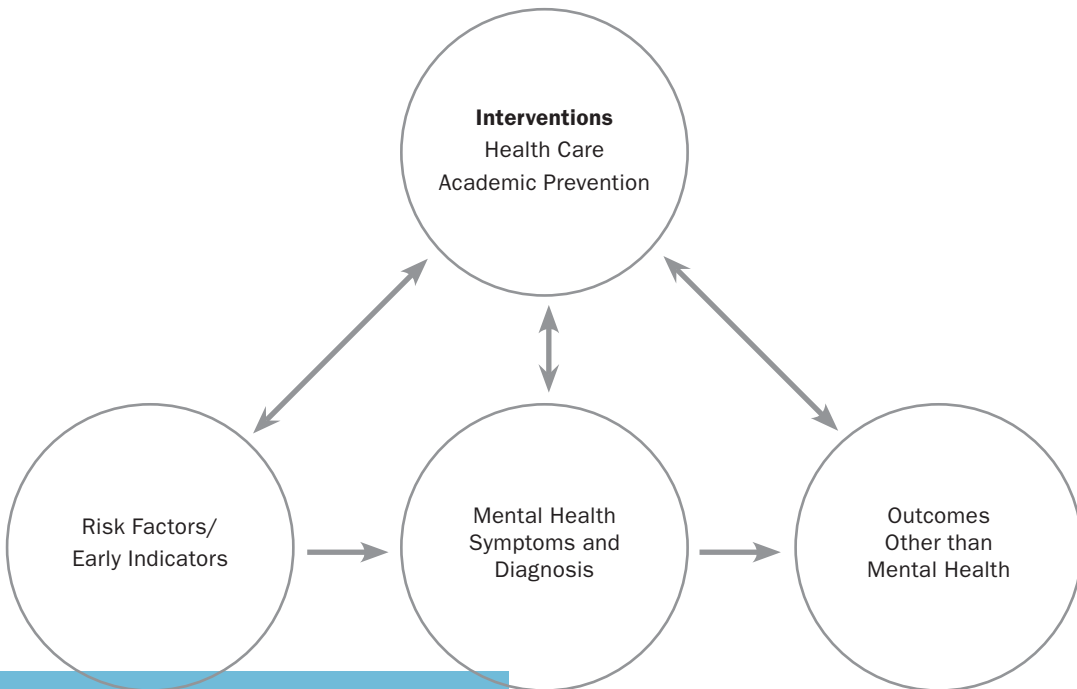
A few studies that follow children over time suggest that children with some mental health conditions—including ADHD, early aggression, and behavioral problems—are at

greater risk for later criminal behavior, partly because of their academic and interpersonal difficulties.³⁴ A study that followed 8-year-old boys with ADHD referred by schools to a psychiatric clinic found that 47 percent of them had been arrested by age 25, compared with 24 percent of a clinic comparison sample without ADHD.³⁵ The reported rates of ever being incarcerated were 15 percent among those with ADHD and 1 percent among those without. When they were interviewed again at age 41, 36 percent of those with ADHD at age 8 reported that they had ever been incarcerated, compared with 12 percent of the comparison group.³⁶ Because these boys were treated in a specialty setting and were likely more severely ill than boys with ADHD who weren't referred to the psychiatric clinic, arrest and incarceration rates among the general ADHD population are likely to be much lower.

Health-Care Interventions

No single system in the U.S. identifies and treats children with mental disorders. Figure 1 illustrates the pathways of various mental health conditions, including treatment settings and outcomes that are relevant for children. The medical or health-care system, including pediatricians, may screen children for mental disorders. Psychiatrists may receive referrals from parents, pediatricians, or school therapists, and they are frequently called on to diagnose complex cases. Both pediatricians and psychiatrists are likely to treat conditions with prescription medication. Schools also play an important role; often, the increased social demands that come with going to school make children's mental conditions more apparent. Autism is one example. In one study, from Atlanta in 1996, 57 percent of cases of autism were

Figure 1. Pathways for Various Mental Health Diagnoses, Treatments, and Outcomes



identified in school, and 40 percent were identified exclusively through school sources. Older children with mental disorders, particularly substance use or conduct disorder, may be identified in schools or in the juvenile justice system.

Many researchers have noted problems with fragmentation, meaning that the medical, school, and justice systems do not coordinate treatment, screening, or prevention. For instance, many children with mental disorders face academic problems, yet these are not the focus of treatments in the medical system. And although the Individuals with Disabilities Education Act provides special education and related services through age 21, few health-care interventions target children in special education, particularly those with severe emotional disturbance.³⁷

In this section, I highlight major interventions for children who have been identified with specific mental health conditions. Overall, we've made significant strides in the treatment of mental conditions, often with approaches that are tailored to the condition or that depend on the child's age. The treatments summarized here have been found to improve children's symptoms; notably less often, they have been able to improve children's ability to function by attending school, gaining employment, or desisting from crime. This continues to be a vexing problem for child mental health professionals, and some attribute this disappointing result to the fractured nature of services for these children.

Treatment of ADHD and Conduct Disorder

For young children with ADHD and conduct disorder, treatment focuses primarily on training parents, including how

to manage and cope with their children's problem behaviors. For example, the British National Institute for Health and Care Excellence's guidelines for both ADHD and conduct disorder recommend group parent training/education programs as a first-line treatment for preschool children.³⁸ Programs for parents include Incredible Years and Triple P, which have both been studied using randomized trials.³⁹ These parent treatment programs, conducted in groups, last 20 to 24 weeks. They involve role-playing and exercises to try at home. Incredible Years focuses on understanding ADHD and its effects, instilling nonpunitive parenting, teaching anger management and how to work with teachers, strengthening parent-child bonds, developing individual goals, demonstrating how children can regulate their behavior with support from parents, and modifying the home environment to provide more structure and predictable routines while offering more opportunities for physical movement, among other components. The program can also be combined with a child training component, as well as a teacher component that focuses on classroom management; these have been found to further improve outcomes. Parent training has also been found to be effective for school-age children with ADHD and conduct disorders through age 12 to 13.⁴⁰ However, for children beyond age 13, little evidence supports parent training for children with conduct disorder or ADHD, despite the fact that parenting may contribute to problem behavior.⁴¹

As children get older, therapy tends to focus on them rather than their parents. Medication is the most common treatment for ADHD in children. The largest randomized controlled study to date, the Multimodal

Treatment Study of Children with ADHD, compared the effect of medication, behavioral therapy, combined medication and therapy, and routine community care (the control group) for children ages 7 to 10. The broad behavioral therapy included parent training, teacher training in classroom behavior management, and child-focused group therapy that addressed both social and academic skills. Children who received the combined treatment did notably better than those who received the routine care with respect to symptoms (oppositional/aggressive and internalizing), teacher-rated social skills, and parent-child relations. Yet these effects did not translate into improvements in math and spelling achievement, and the children saw only small, short-run improvements in reading. A follow-up study roughly two years later found no differences in symptoms or academics. Moreover, when children were assessed again six to eight years after the study, at ages 13 to 18, there were few differences across the groups in psychiatric symptoms, reading, math, grade retention, grade point average, teacher- or parent-reported social functioning, police contacts, or arrests.⁴²

Others have found that treatment with stimulants (the standard medications for ADHD) may have downsides. One rigorous though not randomized study found that, among children with high symptoms of ADHD, stimulant use was associated with worse rather than better educational outcomes, as well as deterioration in children's relations with their parents; girls experienced more depression in the long run.⁴³ The study couldn't say why these outcomes occurred, but it's possible that children either didn't receive the correct dose or that because the medication reduced their visible symptoms, they received less attention and academic support.

Treatment of Autism Spectrum Disorder

Newer screening tools have made it possible to detect autism beginning at age two, making earlier intervention possible. Although there is no consensus on which approach is most effective for ASD, intensive behavioral therapy appears to improve very young children's cognitive and language skills, although the evidence for any one approach is not strong. Treatments can consume 25 hours per week and span the entire year, and they usually occur one-on-one or in small groups. They involve educational interventions to address deficits in language and communication skills, social skills, and self-help skills such as dressing, as well as maladaptive behaviors such as aggression or tantrums.⁴⁴ Parents also receive training. Although children's symptoms may improve, a high level of impairment often remains. Medications are not considered effective for the core of ASD, but two antipsychotics are federally approved for use in adults with ASD to reduce aggression, self-harm, or irritability. Physicians may prescribe other drugs to reduce hyperactivity or inattention, allowing children with ASD to derive greater benefit from behavioral interventions. However, these medications can have pronounced negative side effects.

Though it's generally believed that early intervention is best for children with ASD, only limited research has focused on older children. Most of our knowledge is based on studies of young children, leading to enormous gaps in our understanding about what works best for adolescents with ASD.⁴⁵

Treatment of Depression

Much of what we know about the treatment of childhood depression comes from trials of medication and cognitive behavioral therapy

(CBT) in adolescents. CBT teaches people how to change distorted thinking patterns and unhealthy behavior. The large-scale Treatment for Adolescents with Depression Study (TADS) tested antidepressant medication against combined treatment, that is, medication and CBT.⁴⁶ TADS and similar trials included some degree of participation by parents, either jointly with their children or in separate sessions. TADS found that after 12 weeks, combined medication and psychotherapy produced better results than medication alone. Further, when combined with medication, CBT also offered some protection against suicidal thinking. The effects may not last, however; a meta-analysis of trials that tested medication against medication combined with CBT found no differences in outcomes at later follow-up points, such as 24 and 36 weeks.⁴⁷

Among antidepressants, fluoxetine (Prozac) is the only one specifically approved by the Food and Drug Administration for the treatment of depression in children, and the approval is limited to ages 8 and older. Some antidepressants have been associated with a greater risk of suicidal behavior in children and must carry a special warning on the drug label.

Both adolescents and younger school-age children have been treated for depression using CBT or interpersonal therapy, alone or in combination with medication. In randomized trials, these approaches don't appear to be as successful in younger children as in adolescents, and they are not thought to be developmentally appropriate for children under 8.⁴⁸ Some researchers are developing parent-training programs to assist parents of preschool children who experience depression.⁴⁹ These treatments are in the pilot phase, but they have been

adapted from similar interventions for conduct disorder.

Treatment of Substance Use

Substance abuse begins with the use of one or more substances and moves on to prolonged use that affects brain functioning to the point where consuming the drug becomes compulsive. A number of strategies aim to prevent the onset of drug use; I describe them under prevention programs below. Treating people who have progressed to abusing substances is complex, as their self-control is often compromised and the abuse affects academic achievement, social functioning, and criminal behavior. Moreover, for most substances, use by adolescents is illegal in itself, increasing the chance that users will become involved in the justice system.

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Treatment for substance abuse in adults can include medication, behavioral therapy, or both. Medications help with opioid, tobacco, and alcohol addictions, but only the tobacco-related medications have been approved by the FDA for children under age 18. Studies have found that one medication for opioid addiction, buprenorphine, could

be effective for children as young as 16, but the FDA has not yet approved this use. And buprenorphine must be prescribed by specially certified physicians, meaning access is tightly controlled. Behavioral therapies for addiction have numerous goals, including motivating patients to participate in treatment, cope with cravings, avoid relapse, and improve relationships and communication. For adolescents, behavioral therapies have been modified to include family components and to integrate important social structures such as schools; leading models of behavioral therapy with family involvement include multisystemic therapy, multidimensional family therapy, and functional family therapy. Evidence from at least one study of group therapy suggests that placing high-risk teens in group treatment may be ill-advised, because they may reinforce one another's risky behaviors.⁵⁰

Lessons from Advances in Treatment

Medical research offers several lessons. We have made inroads in improving clinical symptoms for certain conditions such as ADHD, depression, and, to some extent, ASD. Young children with ADHD show improved symptoms with parenting and teacher interventions and respond to individual or group therapy when they are older, while intensive behavior therapy along with parent training is favored for children with ASD. Very young children with depression appear to benefit from parent interventions, while older children show success with cognitive-based therapies. Medication is frequently used to treat children with ADHD, and studies show that it reduces symptoms. Because children with ADHD and ASD, and those who are at risk for substance abuse, are likely to experience problems in school, there has been a focus on earlier childhood intervention. Early intervention may also be important because there may be critical

periods when the developing brain is relatively more plastic and thus offers more opportunity for change; for many mental disorders, however, we don't know whether such a critical window of opportunity exists. Improving educational outcomes has not been the central focus of most clinical interventions. They more often focus on improving mental health symptoms or behaviors, and improving academic performance remains difficult.

Academic Interventions

Most children spend much of their time in school. Because so much evidence points to a link between mental health disorders and poor academic and social outcomes, new mental health interventions have been designed to directly improve these outcomes, rather than simply target mental health symptoms. In some cases, these direct-targeting interventions single out children with mental disorders. In other cases, their approach is broader—they identify an at-risk group with high rates of mental health problems, such as economically disadvantaged children who also have trouble in school.

Direct Targeting

The direct-targeting approach has been studied among children with ADHD and conduct disorder. Direct-targeted interventions focus on academic deficits and fall into several categories: approaches directed at classroom behavior management, at parents, and at teachers. Classroom behavior management for children with ADHD, which was incorporated into the psychosocial treatment component of the Multimodal Treatment Study, includes goals- and rewards-based behavior management programs. These are delivered in cooperation with teachers and parents, for example, using a daily report that

documents behavior goals and rewards. Such approaches rely on participation by school counselors and teachers and can be difficult to implement or sustain.

Challenging Horizons is a classroom management program designed for middle school students with ADHD.⁵¹ This after-school program incorporates behavioral strategies (such as a daily report or a point system) administered by teachers along with monthly parent-training groups. Children are taught organizational and study skills, problem-solving steps, and core social skills, individually and in groups. By comparison, children in the Multimodal Treatment Study were younger and were taught social, academic, and study skills through an eight-week intensive summer program.⁵² Preliminary findings from Challenging Horizons show some improvement in social functioning and classroom disturbance as rated by parents and teachers, but few academic gains.

Some other approaches don't involve behavior management; they include alternative teaching methods or new curricula.⁵³ These, too, require support from a student's regular classroom teacher. In general, evidence for many academic interventions—child-peer approaches, computer-based approaches, and modification of assignments and materials—is sparse, and at this stage these interventions show modest early promise.

Still other approaches target learning barriers associated with specific mental disorders, for example, memory deficits. But when they've been tested in randomized trials, the results so far have been discouraging, showing no improvement in ADHD symptoms, more complex memory tasks, or academic tests (reading, spelling, and math), at least in the very short run.⁵⁴

Broader Academic Interventions

Some interventions reach out to a broader audience than children with mental disorders alone. One such strategy is ParentCorps, which seeks to reach families of prekindergarten students in disadvantaged urban communities.⁵⁵ The program focuses on improving children's behavior in school and improving their academic performance through parent training. Parents are trained by mental health professionals and teachers in the evening hours at their children's schools. They are taught to support children's positive behaviors, manage their behavior effectively, and get involved in their education. All parents in the interventions schools are offered the evening program, and all teachers are offered professional development training. ParentCorps was studied in two randomized trials, in which one set of schools received ParentCorps and another set of randomly selected schools did not. It was found to increase kindergarten achievement test scores in reading, writing, and math achievement, roughly two years after the intervention. ParentCorps was also found to increase teacher-rated academic performance. Longer-term outcomes are being collected but have not yet been published.

There are two major reasons to target interventions toward adolescents. In some cases, mental health conditions don't emerge until adolescence, when they begin to impact school performance. In other cases, the effect of treatment received when children are younger may fade. Several interventions for adolescents have targeted school achievement, using a math tutoring component, CBT, or a combination of the two. Like ParentCorps, these are broad-based interventions directed at minority children in disadvantaged areas. They are not directed at

individuals who have a mental illness, but in some cases they use mental health intervention strategies.

One example, the Pathways to Education Program, offered in a housing project in Toronto, provided case management, intensive tutoring, group activities, and financial support for school, college, and transportation expenses. By relying on tutors, schools can avoid the difficulties experienced with models that rely on teachers. Pathways produced better grades, large increases in high school graduation rates (which rose from 38 percent to 58 percent), and a greater chance of enrolling in college.

Another intervention, with boys in seventh through ninth grade in the Chicago Public Schools, focused on crime and educational outcomes, but not test scores specifically.⁵⁶ The study randomized over 2,700 boys to the usual school programming, a group-based CBT program called Becoming a Man (BAM) offered in school, Becoming a Man offered with after-school programming, or after-school programming only; there was no tutoring group. The Becoming a Man program was offered weekly over 27 weeks. Half of the teens who were offered the program attended, and those who attended came for an average of half of the sessions. The BAM groups had higher grade-point averages, but they saw no improvement in the chance of dropping out by year's end or average days of school attendance. The BAM group participants were less likely to be arrested for both violent crimes and nonviolent crimes in the first year of the program; however, there was no difference in arrests during the following year.

The research on academic interven-

tions paints a mixed picture. First, while academic problems are prevalent among children with mental disorders, it isn't yet clear whether interventions should be tailored to specific mental disorders or to the mechanism that drives the learning challenges. Second, some interventions, such as classroom behavior management, rely on teacher compliance, which may be difficult to achieve on a large scale. Academic interventions are being developed using components that have been tested in clinical psychiatry research, such as parent training or CBT for youth. However, we don't always know whether the therapy components in these interventions would meet the high standards established in clinical settings. Perhaps if they did, their outcomes would be better. Third, tutoring for disadvantaged youth appears to yield large gains, on average. We don't know how youth with mental disorders are affected, but it's possible that tutoring programs could take these differences into account. Finally, because most studies have included only students attending school, they have by design excluded those who have dropped out. We likely need different approaches for dropouts.

Delinquency and Juvenile-Justice Interventions

Interventions for delinquency sometimes begin with younger children, often those who have trouble with self-control or aggression, and are sponsored in schools or communities. Another set of interventions targets crime among youth who have already reached the juvenile justice system and typically, therefore, are over 10 years old. Although these youth are referred to treatment by the justice system, the treatment is delivered in the community.

Programs for younger children have achieved some success. A summary of 34 randomized trials found that interventions targeted at children under age 10 can increase their self-control and reduce delinquency, with consistent results whether those reporting the behavior were teachers, parents, or outside observers. The improvements were generally larger for girls than for boys. No outcomes were assessed beyond age 12, however, so these studies don't tell us whether improvements in self-control or delinquency persisted over time or reduced the chances of criminal behavior, which tends to come later in life.⁵⁷

The Seattle Social Development Project, which targeted elementary school-age children (from first through sixth grade) in high-crime portions of Seattle, exemplifies a more broad-based approach.⁵⁸ Because of their disadvantaged environment, these children were considered at risk for perpetrating violence. One group of children was assigned to classes where teachers received instruction in classroom behavior management; their parents received training in interpersonal cognitive problem-solving, with a focus on social bonding. Eighteen months after beginning the program, boys who participated were significantly less aggressive than were boys who did not, according to teacher ratings. The girls in the program were not significantly less aggressive, but they were less self-destructive, anxious, and depressed. In a follow-up at age 18, the intervention group reported significantly less violence. Follow-ups at ages 24 and 27 found no differences in criminal activity, although the experimental group reported significantly higher educational and economic attainment and better mental health. Thus this intervention directed at elementary school children had a number of positive outcomes.

Another effort, Reclaiming Futures, targets teenagers who are involved in the justice system and who use or are at risk of using substances. These youth are typically served by multiple, redundant, and uncoordinated agencies; often, a judge's orders determine whether they receive services. Reclaiming Futures attempts to establish teamwork across agencies and develop a community-wide response to the needs of this group of teens. Communities in 10 sites pursued different strategies, but each tried to screen and assess teens for substance abuse and link them to family and individual services, including prevention, health, and education services. An evaluation of the program found that agencies worked more collaboratively and that, at some sites, the youth received more mental health and substance abuse services. However, it is not clear whether the initiative reduced subsequent crimes.⁵⁹

Prevention Approaches

One approach to mental health problems is prevention rather than treatment. This encompasses both primary prevention, or preventing mental health problems before they occur, and secondary prevention, which involves minimizing or correcting the course of a problem once it has begun to manifest.

Successful primary prevention requires a solid understanding of what causes mental health problems. If the source is genetic, we may find ways to prevent the disorder before it develops, or we may be able to develop better treatments. In fact, ADHD and ASD appear to have a genetic component—children who have a sibling with the condition are more likely to have the condition themselves.⁶⁰ Aside from genetic factors, some mental health problems appear to originate during pregnancy. For instance,

ASD has been linked to certain prescription drugs taken during pregnancy, and ADHD has been linked to maternal smoking and alcohol use. Aggression and behavior problems have also been tied to prenatal exposure to substance abuse. Low birth weight has been tied to ASD, ADHD, and learning problems.⁶¹ Fathers' age may also play a role—children born to older fathers are more likely to use substances and to have autism, schizophrenia, and ADHD.⁶² Finally, environmental and social factors can cause mental health problems. For example, children exposed to lead are more likely to experience ADHD, and behavior problems have been tied to family poverty and harsh negative parenting practices.

Prevention encompasses both primary prevention, or preventing mental health problems before they occur, and secondary prevention, which involves minimizing or correcting the course of a problem once it has begun to manifest.

A central consideration for secondary prevention is whether there are sensitive developmental periods when intervention is more effective or less costly. For example, children's emotional attachments are established in their very early years, while IQ appears to stabilize by age 10. Adolescence is both a critical period of risk-taking and potential substance use and a period of potential

intervention because portions of the adolescent brain are still plastic. Not surprisingly, therefore, prevention programs' emphasis depends on a child's age.

Other articles in this issue discuss early interventions for young children. Scholars have examined these prevention efforts, such as home visiting programs or Head Start, for their impacts on emotional outcomes for young children in general. However, we don't know whether such programs are particularly effective for children with mental disorders. Because the children in the studies were from disadvantaged families, they also were more likely to have mental health disorders, but none of the studies report outcomes specifically for children with mental disorders. More recently, some newer nurse home visiting programs have explicitly included mental health consultation for both parents and children.⁶³ No rigorous evaluation of this approach has yet been conducted.

Head Start and Mental Health Targeting

Head Start programs have also been modified for children with mental health problems. Generally speaking, Head Start enrolls children ages three to five in an enhanced preschool program that also includes medical services, meals, and parent training. Several studies have compared children in Head Start to those who don't participate and found some improvement in IQ and achievement test scores, but these effects fade or persist only for white children.⁶⁴

Modified versions of Head Start have included evidence-based clinical interventions for mental health. In one study, children in 14 Head Start centers were randomized to receive Incredible Years training for teachers, parents, and family services

workers or to a control group that received Head Start only (see the article in this issue by Lawrence Berger and Sarah Font for more about Incredible Years). The Incredible Years training was targeted to all children in the Head Start center, not just children with conduct disorder or hyperactivity. Immediately after the intervention, children who received Head Start plus Incredible Years demonstrated fewer conduct problems at home and at school, as reported by parents and teachers, and less hyperactivity at school.⁶⁵ Improvements were greatest among children considered at high risk for conduct problems. One year later, parents of children in the Incredible Years group continued to report fewer conduct problems, and many fewer of these children were considered at risk for deviant and noncompliant behavior.

A similar study in the United Kingdom replicated Head Start plus Incredible Years for 104 children and their parents, and compared them with 29 children on a wait list.⁶⁶ At six months after the program began, the intervention group experienced fewer parent-reported behavior and hyperactivity problems than the comparison group. At 18 months after the program began, the treatment group could no longer be compared with the wait-listed group because the wait-listed children had entered treatment. However, the treated children showed no loss of the benefits from the program.

These modifications to Head Start show that the program can be successfully tailored for children with mental disorders. But we need more research to assess whether these efforts should be broad-based or more targeted. Studies could also test whether the programs should include parent training, teacher training, or both for the greatest impact.

Prevention and Substance Abuse

Aggressive behavior among children can presage academic and social difficulties that can lead to greater risk for problems such as substance use, particularly in families where parental attachment and control is lacking or where parents abuse substances. Thus, early interventions targeted at impulse control and family attachment are central to preventing substance abuse among children.⁶⁷ Prevention efforts that target young children whose parents abuse substances include the Strengthening Families Program (SFP), which supports parents who abuse drugs and have children ages 6 to 11. Over 14 weeks, parents and children receive training in separate groups and are then brought together for family training.⁶⁸ In a randomized study, results were the best when three program components were combined—parenting training, children’s skills training, and family relationship enhancement. These led to improved child behavior and fewer emotional problems, improved family communication, and reduced family conflict.

When children enter adolescence and become more prone to taking risks and experimenting with peers, the focus turns to prevention messages around drug-free behavior, reducing self-harm, peer interaction, and avoiding the temptation to try drugs.⁶⁹ Programs that broadly target middle schoolers include, for example, the Life Skills Training Program and Project Alert, which teach self-management and drug resistance. In randomized studies, these programs have been found to reduce initiation of drinking, smoking, and drug use in high school.⁷⁰

Overall, adolescence is characterized by an increase in the likelihood of harm from such things as injury, depression, anxiety, and

substance use.⁷¹ Some adolescents are more prone to taking risks than others, due to observable differences in their brains, their personalities, or experiences such as changing schools or divorce. This suggests the need for targeted interventions for adolescents, in addition to more general approaches. Some interventions, such as the Adolescent Transitions Program, are “tiered”—that is, they address both broad audiences, in this case entire schools, and targeted groups, in this case at-risk families within the schools. In two randomized studies, Adolescent Transitions was found to decrease total problem behavior, reduce youth smoking, and decrease antisocial behavior at school.

A different but very successful community prevention approach has been applied to tobacco use. We’ve had great success in reducing teen smoking by increasing the price of tobacco through taxes, because teens are particularly sensitive to the price of tobacco. Moreover, reducing teen smoking can have far-reaching implications, both because most adult smokers began smoking when they were in their teens and because teens smoke in response to peer behavior.⁷² Studies estimate that a 10 percent increase in the price of cigarettes leads to a 6 to 12 percent decline in the prevalence of teen smoking. The most recent U.S. federal tobacco tax increase, in 2009, was particularly large, from \$0.39 to \$1.01 per pack of cigarettes; it has been associated with a 9.7 percent decline in teens’ cigarette use and a 13.3 percent decline in their use of other tobacco products.⁷³ Observational studies that compare states over time show that state policies to ban cigarette vending machines, require identification for younger purchasers, and prohibit the distribution of free samples are also effective.⁷⁴

Funding and Fragmentation

The intervention services I’ve described—health care interventions, academic interventions, and prevention programs—are funded in different ways and take place in different settings. The nature of funding can contribute to an underlying lack of integration among medical providers, schools, and justice agencies.

Health care services, such as medications and mental health therapies, are paid for to varying extents by health insurance. Thirty-one million U.S. children have public health insurance coverage through Medicaid or the Children’s Health Insurance Program (CHIP), including half of all low-income children (see the article in this issue by Lindsey Leininger and Helen Levy). Most children become eligible for Medicaid or CHIP based on their age and family income, but some become eligible because a disability qualifies them for Supplemental Security Income. People who receive SSI automatically receive Medicaid.

The structure of health insurance can make it difficult to fund intensive mental health interventions.

The structure of health insurance can make it difficult to fund intensive mental health interventions. Because health insurance pays for individual services on behalf of those who are covered, it may not pay for parent education or for therapies that target parents and children jointly, particularly if the parents are not eligible for Medicaid; it also doesn’t pay for

interventions that target teachers or schools. Moreover, each service paid for by insurance must be provided by a licensed health practitioner, whereas some interventions rely on peers or educators. Finally, health insurance often doesn't cover the time that health-care providers spend interacting with schools and community service agencies.

Aside from insurance, mental health programs for children are also funded through federal grants from the Substance Abuse and Mental Health Services Administration. Such programs include Comprehensive Mental Health Services for Children and Families, which supports services for children, and the Substance Abuse Prevention and Treatment Program, which serves adults and children. These funds are distributed in a variety of ways, for example, to states via a federal formula or to local agencies that compete for them. This type of funding, though small compared to Medicaid, is more flexible than funding through health insurance. It can support outreach, public education, prevention programs, screening services, treatment, and, to some extent, coordination among agencies. However, such funds can also be limited to specific communities, settings, or priority areas. Substantially smaller federal block grant programs exist for juvenile justice populations. These include programs through the Office of Juvenile Justice and Delinquency Prevention that are specific to youth who are involved with the justice system but don't reside in correctional facilities.

Children also receive support through special education programs funded by the federal Individuals with Disabilities Education Act (IDEA). In 2014, IDEA funding totaled \$12.5 billion. The act's main provision, Part B, provides \$11.5 billion in grants to states and local agencies, based on the population

living in poverty, to support the additional cost of educating children with disabilities. Services are offered to students in kindergarten through grade 12, and in some cases to preschool children ages three to five. Part C of IDEA supports modest early intervention services for infants and toddlers, including screening, assessment, referral, and treatment.

In 2010–11, 6.1 million children with disabilities, or 13.1 percent of all students, received special education services.⁷⁵ The IDEA program tracks the types of disability among the children it serves. The largest category is "specific learning disability," accounting for 37 percent of children in special education. Intellectual disability, emotional disturbance, and autism each account for 6 to 7 percent of children in special education. Conditions such as ADHD don't have their own recognized disability category; ADHD is captured under "other health impairments" if a child's educational performance is affected. That said, many children with ADHD could fall under the learning disability category based on another condition. Once a child is identified as eligible, special education can support a variety of services, including mental health therapy in the community and in school; parent counseling and training; curriculum and instructional supports; tutoring services; and modified teaching and testing materials. In general, states vary widely in the distribution of disabilities under IDEA, highlighting the influence of local practices and policies. One challenge for planning, designing, and coordinating services across health-care and school settings is that the IDEA disability categories don't conform to clinical definitions.

Conclusions

Child mental health is a serious public health and social problem, yet our interventions

are notable for their lack of cohesiveness. Mental health disorders can affect children at different ages and can be detected and treated in health-care settings, schools, and even justice agencies. Funding streams follow idiosyncratic rules that make services more difficult to coordinate and deliver. When services are provided, they often focus on one dimension of a child's mental health, such as symptoms, without sufficient attention to long-term outcomes such as educational success and employment. Divided system responsibilities for children also make it difficult to deliver prevention programs. All this can come at a heavy cost both for children and for society.

How can we generate lasting gains in education and other life outcomes for children with mental disorders? Even where our interventions reduce children's mental health symptoms—particularly for ADHD and depression, but also for conduct disorder and autism—this success doesn't translate into success in other areas such as education. This is not to say that education is the only important outcome, but it is an important milestone for children, and results from our medical interventions have been disappointing. Future intervention studies need to track children's progress through the early school years, middle childhood, and adolescence and help sort out whether better school outcomes can be achieved only if mental health symptoms improve or whether an intensive focus on education and overall functioning is more important than mitigating mental health symptoms.

Substantial evidence indicates that, on average, early intervention is better than later intervention for disadvantaged children. Work in this area should be extended to help understand the advantages of early

intervention for subgroups of children with mental health diagnoses. Policy makers also need to know whether we obtain the best results by broadly reaching out to minority populations living in disadvantaged neighborhoods, that is, areas with disproportionately high rates of mental disorders, or whether our approaches should be adapted specifically for children with mental disorders. And if approaches are adapted for children with mental disorders, how broadly should they be applied?

While prevention and early intervention play an important role in child mental health, we are increasingly finding evidence that our programs can help at later ages as well. New interventions to address academic and social deficits are being designed for adolescents with substance abuse and behavior problems. Tiered approaches that provide interventions to entire at-risk communities of children and then focus additional services on high-need families are also being developed. For some disorders and at some ages, we lack solid interventions, such as for autism in teens.

To improve our policies across the age spectrum, we need to understand several dimensions of the problem: How effective is the treatment at earlier versus later ages? Do early effects taper off? Does this differ by mental disorder? And what is the timing of important outcomes? Initiation into crime, for example, is heavily concentrated in the adolescent years. On the one hand, this would appear to imply that targeted approaches may be warranted. On the other hand, precursors to crime, such as problems with self-control, can be effectively targeted at earlier ages. Finally, we need to identify effective approaches that help overcome the fragmentation of medical, school, and social services.

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