Youth suicide prevention: does access to care matter?

John V. Campo

Department of Psychiatry, Nationwide Children's Hospital, The Ohio State University, Columbus, Ohio, USA

Correspondence to John V. Campo, MD, Department of Psychiatry, Nationwide Children's Hospital, 700 Children's Drive, Timken H-205, Columbus, OH 43205, USA
Tel: +1 614 722 2291; fax: +1 614 722 0491; e-mail: john.campo@nationwidechildrens.org

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Purpose of review

Recent increases in adolescent suicide rates after a decade of decline highlight the relevance of pediatric suicide prevention. Existing strategies to intervene with youth at risk for suicide are largely based on the premise that access to effective services is of critical importance. This review aims to examine the relationship between youth suicide and access to care.

Recent findings

Promising reductions in suicidal thinking and behavior have been associated with the application of manualized psychotherapies, collaborative interventions in primary care, lithium for mood-disordered adults, and clozapine in schizophrenia. Suicide rates correlate inversely with indices of care access across the lifespan, including antidepressant prescription rates.

Summary

Suicide is a preventable cause of death, and any public health relevant effort to prevent youth suicide must include improving access to effective care for at-risk youth as a strategy. Education and training of professionals and consumers, the integration of mental health services in primary care, and the use of novel technologies to track and maintain contact with at-risk youth are worthy of study. Additional research on the relationship between specific treatments, especially antidepressants, and youth suicide risk reduction is desperately needed.

Keywords

antidepressive agents, health services accessibility, mood disorders, primary healthcare, suicide

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Introduction

An examination of the relationship between pediatric suicide and access to health and mental health services is particularly opportune given emerging evidence that the rate of suicide among youth between the ages of 10 and 19 years in the United States increased by nearly 20% in 2004 after a decade of decline, representing over 300 additional pediatric suicide deaths annually and highlighting the public health importance of suicide prevention efforts [1•]. There is growing consensus that untreated psychiatric disorders are the most substantial remediable risk for youth suicide [2]. Over 90% of suicide victims suffer from at least one psychiatric disorder, and greater disorder severity and chronicity are associated with heightened suicide risk [3]. The association of youth suicide with depression and other mood disorders is particularly strong, with the majority of pediatric suicide victims suffering from a depressive disorder at or near the time of death [4,5]. Depressive disorders early in life predict suicidality and completed suicide later in life; other psychiatric disorders, most notably substance use and disruptive behavioral disorders, are also associated with substantially heightened risks for completed suicide [3]. The presence of multiple psychiatric disorders appears to confer even greater risk, with the combination of mood and disruptive behavioral problems or substance use being of special concern given the pairing of emotional misery and vulnerability to impulsive behavior.

Not surprisingly, an important strategy in preventing suicide has been the provision of treatment to at-risk youth with mental disorders, particularly depression. Existing clinical efforts to address the needs of youth identified as being at risk for suicide in communities across the United States are largely based on the premise that access to effective mental health services is of critical importance [6]. Unfortunately, despite the plausibility that access to effective mental health services can reduce suicide risk, definitive proof has been elusive. The aim of this review is to examine what is currently known regarding the relationship between youth suicide and access to health and mental health services.

Randomized controlled trials

Randomized controlled trials (RCTs) remain our most powerful tool in intervention research. The relatively low base rate of suicide and suicide attempts makes their application to suicide prevention research quite demanding, particularly given other methodological challenges and the unease of both investigators and regional institutional review boards with the study of interventions designed to reduce suicide risk.

Adult randomized controlled trials

Meta-analyses of randomized controlled trials (RCTs) of antidepressant medications have failed to demonstrate a significant reduction in completed suicide or suicide attempts [7,8]. There is now persuasive meta-analytic evidence that lithium reduces the risk of suicide and suicide attempts in the treatment of bipolar disorder and recurrent major depression in adults [9,10]. Although less well studied, some evidence suggests that clozapine reduces suicidal behaviors in patients with schizophrenia [11,12]. Psychotherapeutic treatments have also been found to be useful in reducing suicide attempts in at-risk adults, including cognitive behavioral therapy (CBT) [13] and dialectical behavior therapy [14]. A recent systematic review and meta-analysis supported the hypothesis that CBT can reduce adult suicidal behaviors [15•]. Treatments focused specifically on reducing some aspects of suicidal behavior were more likely to be effective in diminishing suicidality than treatments that primarily target symptoms of depression and emotional distress.

Pediatric randomized controlled trials

Pediatric trials specifically targeting suicidal thinking or behavior as an outcome are particularly unusual, and it is critical to note that most trials have been compromised by the exclusion of youth at high risk of suicide, relatively low base rates of suicidality, and/or insufficient systematic assessments for suicidal thinking and behavior. The adolescent CBT studies reviewed by Tarrier *et al.* [15•] did not show clear benefits for CBT in reducing suicidal behaviors. While raising questions as to whether this population may be especially difficult to treat, the relatively small data base tempers definitive conclusions. In an important trial that compared CBT, family therapy, and supportive psychotherapy in the treatment of adolescent depression, CBT was superior to family and supportive therapies for depressive symptoms, but there were no differences between the groups in terms of suicidality despite approximately 40% of patients in each cell reporting suicidal ideation with plan at study outset [16]. Another ambitious study conducted by Harrington *et al.* [17] compared a home-based family intervention with usual care in the management of adolescents who had attempted suicide by overdose, but found no meaningful differences in suicidal thinking or attempts between the groups. Wood *et al.* [18] randomized 63 adolescents with a history of multiple suicide attempts to routine care augmented by a group therapy intervention or to routine care alone and found group participants to be less likely to make repeated attempts after randomization, but no intervention-specific differences in suicidal ideation or depression. Multisystemic therapy was reported to be significantly more effective than acute psychiatric hospitalization in reducing attempted suicide in high-risk youth over a 16-month period of follow-up, but differences in suicidal ideation or depression were not noted [19]. In a pilot study that compared a skill-based treatment with supportive therapy for adolescent suicide attempters, Donaldson *et al.* [20] noted significant decreases in suicidal ideation and depressed mood but no significant between-group differences. Studies focused on enhancing treatment compliance for adolescent suicide attempters have to date failed to show significant reductions in suicide attempts or ideation [21,22].

Both antidepressant and psychotherapeutic treatments for adolescent depression were evaluated in the Treatment for Adolescents with Depression Study (TADS) [23,24] and the Treatment of SSRI-Resistant Depression in Adolescents (TORDIA) study [25••], and both studies attempted to explore the differential effects of specific treatments on youth suicidal thinking and behavior as secondary aims. Approximately one-third of TADS patients endorsed significant suicidal ideation at study entry, but youth considered to be at especially high risk were excluded from participation. At 12 weeks, suicidal ideation had decreased in all treatment groups, with the greatest reduction noted in the combination fluoxetine and CBT group [23]. At 36 weeks, suicidal events were noted in 10% of study participants and were more common for youth receiving fluoxetine monotherapy than for those being treated with combination therapy or CBT alone [24]. A recent examination of suicidal events in TADS notes that most occurred in the context of persistent depressed mood and impairment, without any evidence of medication-induced behavioral activation [26••]. The TORDIA study targeted depressed youth who had failed to respond to a previous trial of a selective serotonin reuptake inhibitor (SSRI) antidepressant, with nearly 60% of participants endorsing clinically significant suicidal ideation at study entry [25••]. Patients were randomized in a 2 by 2 factorial design to switch to either another SSRI or venlafaxine, with or without CBT. Approximately one of five patients experienced a suicidal adverse event during the first 12 weeks of treatment, but meaningful differences in suicidality were not identified among the various study groups [25••]. In contrast to TADS, the combination of antidepressant medication and CBT did not offer any advantage over medication alone in reducing suicidality.

Interestingly, the adjunctive use of benzodiazepines in a small number of TORDIA patients was associated with higher levels of suicidal and nonsuicidal self-injury, and venlafaxine treatment was associated with higher levels of suicidal adverse events in patients with especially high levels of suicidal ideation at study entry [27••].

Primary care-based studies

A systematic review of suicide prevention strategies conducted by a panel of experts from 15 countries concluded that professional education in suicide risk evaluation and depression recognition and treatment in primary care settings were among the most promising approaches to reduce completed suicide [28]. Interventions designed to increase the capacity of primary care clinicians (PCCs) to assess for suicidality or diagnose and treat depressive disorders or both have proven successful in decreasing suicidality and suicide rates in several studies. A study of special interest and importance compared usual care with an intervention package for elderly depressed patients in primary care that included on-site care management and a depression treatment algorithm [29••,30]. The collaborative care intervention was superior to usual care in engaging participants in evidence-based treatment (i.e., antidepressants and/or psychotherapy) and in reducing suicidal ideation and depressive symptoms.

A landmark 6-month quality improvement intervention designed to improve access to evidence-based treatment for adolescent depression in primary care demonstrated significantly greater access to mental health services and improvements in depression for the intervention group and also found a 55% reduction in suicidality for the intervention group compared with an 18% reduction for the treatment as usual control group [31]. Although the difference in suicidality was not statistically significant, perhaps due to relatively small cell sizes, results suggest that this is a promising area of inquiry in future studies of the effectiveness of depression treatment in adolescents. Although there is much to recommend augmentation of mental health services in the primary care setting [28], the importance of a comprehensive system of care that still includes specialized mental health services is reflected in Finnish findings that the risk of suicide may be increased in association with dramatic shifts of mental health services away from specialty settings to primary care [32••].

Other interventions

Studies of interventions designed to maintain long-term contacts with patients at high risk of suicide have also demonstrated reductions in suicide rates in comparison to usual care [33]. A recent multisite study conducted in developing countries randomized nearly 1867 suicide attempters to treatment as usual or to an intervention consisting of brief psychoeducation and systematic follow-up contacts [34••]. After an 18-month period of follow-up, the brief intervention group was significantly less likely to die by suicide or by any cause than the comparison group, demonstrating that a relatively simple, brief, and low-cost intervention could have a significant impact on reducing death by suicide. Technology as simple and ubiquitous as the telephone has proven to be an important tool in maintaining ongoing contact with intervention patients in several such studies [33,34••].

Population-based studies

Ecological studies focused on populations have proven to be an important tool in suicide prevention research given existing limitations and challenges in the application of RCTs to the examination of whether specific interventions can modify suicide rates. Although the associations noted in such studies cannot be used to determine causality, a measured appreciation of study results can be useful in directing future studies and targeted public health efforts.

Regional studies

Suicide rates vary by country, as well as by geographic region within the United States, with ecological studies typically finding that suicide rates are negatively correlated with indicators of access to health and mental health services [35•,36]. Higher levels of federal aid directed towards the provision of mental health services were reported to be the most potent factor associated with reduced suicide risk across the lifespan, followed by higher per capita density of physicians and psychiatrists [36]. As an illustration, it is interesting to note that the lowest suicide rates in the country are found in Massachusetts, New York, and the District of Columbia, with the highest in New Mexico, Montana, and Nevada. Investigators in Finland recently exploited variability in the delivery of community mental health services in the wake of service reform initiatives and studied the relationship between regional differences in suicide rates and local mental health service delivery systems [32••]. After adjustment for local socioeconomic and demographic factors, lower suicide rates were associated with greater local access to multifaceted outpatient mental health services. Other service factors noted to have influence on reducing local suicide rates included a predominance of outpatient services relative to inpatient psychiatric services and the availability of 24-h emergency psychiatric services. In an examination of subsequent suicidal behavior in individuals who had made a suicide attempt in Colorado, residence in a county that offered a minimum safety net of mental health services that included crisis intervention and case management was associated with a decreased risk of suicidal behavior [37].

Antidepressants and suicide

Because challenges related to sample size, methodology, and cost make it exceptionally difficult to determine if antidepressants or psychotherapy or both significantly modify rates of completed suicide via RCTs, investigators have turned to population-based data, though the risk of ecological fallacy is real and causality cannot be inferred. Several studies have demonstrated a negative correlation between antidepressant prescription rates and suicide rates across a variety of countries and within circumscribed geographic regions [35•,38,39•]. Ludwig *et al.* [40•] evaluated the relationship between sales of SSRI antidepressants and suicide rates in 26 countries and concluded that increased SSRI sales of one pill per capita were associated with a 5% reduction in the rate of completed suicide. Regions of the United States where the prescription rates for SSRIs and other newer generation antidepressants are proportionally greater than those for tricyclic antidepressants (TCAs) report lower suicide rates, with the highest suicide rates being in rural areas with fewer overall antidepressant prescriptions and a lower proportion of prescriptions for SSRIs [38]. Although these findings may reflect differences in drug effect or the reduced toxicity of SSRIs in overdose, greater proportional use of TCAs may also be a marker for more limited access to effective mental health care.

Pediatric antidepressant use and suicide

The so-called 'black box' warning issued by the Food and Drug Administration (FDA) for pediatric antidepressant use in 2004 has created the opportunity for an unwanted but potentially important natural experiment on the population level. An FDA-commissioned review and meta-analysis of 24 short-term placebo-controlled antidepressant trials that included over 4400 children and adolescents found that, though no suicides occurred in the study sample, approximately 2% of youth taking placebo and 4% taking antidepressants developed new suicidal thoughts or behaviors – a small, but statistically significant, difference [41]. A subsequent meta-analysis that expanded this sample to over 5000 patients from 27 pediatric antidepressant trials found an even smaller, but real, increased risk of suicidality, with a 0.7% risk difference between the groups [42].

The temporal association of the FDA warning with the first observed increase in the US youth suicide rate in over a decade [1•] has generated questions about whether the relationship could indeed be causal. There is at least circumstantial evidence that care access for depressed youth declined in the wake of the FDA warning [43,44,45•,46•]. Libby *et al.* [44] conducted time series analyses of depression diagnoses, medication prescriptions, and psychotherapy visits between 1999 and 2007, a period straddling the FDA black box warning of 2004. New pediatric diagnoses of depression by PCCs fell by 44% and the use of SSRIs decreased, suggesting that the FDA warning may have had unintended effects on care delivery, with a decline in depression case finding in primary care and no compensatory rise in the delivery of pharmacological or psychosocial treatments. As a decrease in the incidence of pediatric depression is improbable, there may be a degree of clinician reticence to make the diagnosis of depression in youth, perhaps driven by provider anxiety in the wake of the 'black box' warning. The rate of antidepressant prescriptions and ambulatory visits for pediatric depression also decreased in Canada after the FDA warning whereas the pediatric suicide rate rose significantly [45•]. In an evaluation of antidepressant prescription rates and youth suicide in the United States and the Netherlands following the FDA warning, increases in the suicide rate in both countries were associated with decreases in pediatric SSRI prescription rates of over 20% [43]. Real, but more modest, declines in pediatric antidepressant prescriptions after the FDA warning have been reported by others [46•]. Again, inferences regarding causality cannot be sustained based on purely ecological data.

Despite concerns related to antidepressant safety based on review of adverse events during relatively short-term RCTs, population-based evidence of an association between pediatric antidepressant treatment and a reduced risk of suicide is actually growing, raising questions as to whether any short-term increased risk of suicide associated with antidepressant use on an individual level might be offset by benefits of longer-term treatment and population-wide protective effects. Olfson *et al.* [47] explored the relationship between antidepressant treatment and suicide for youth aged 10–19 years by comparing antidepressant prescription and suicide rates in US zip code regions between 1990 and 2000. Main study analyses found that increases in prescription rates of antidepressant medications to adolescents were associated with statistically significant reductions in corresponding regional suicide rates. Reductions in suicide rates over time were only observed for second-generation antidepressants such as SSRIs, but not for TCAs, and were particularly strong in older adolescents, in whom suicide is more likely to be associated with psychiatric disorder, and in lower-income regions, where rates of psychiatric disorder tend to be higher and access to care especially poor. A 1% increase in antidepressant treatment within a given region was associated with a decrease of 0.23 suicides per 100 000 adolescents each year. Regions with exceedingly low antidepressant prescription rates were excluded from study analyses, but were characterized by lower population densities and higher suicide rates than the regions included. Another investigation that examined the relationship between SSRI antidepressant use and suicide in younger children aged 5–14 years using county level suicide rate data between

1996 and 1998 and a different source of prescription data than the previously cited study found significantly lower suicide rates in US counties with higher SSRI prescription rates [48]. Again, because comparisons are between regions rather than individuals, these findings are open to ecologic challenge.

It is worth noting that these results are not inconsistent with the collective results of RCTs of antidepressant and psychotherapy efficacy, as a decline in suicidality is typically found across most intervention groups. The relatively constricted time course of treatment in existing RCTs may make it difficult to draw conclusions with regard to clinical interventions in community settings. Encouraging results related to antidepressant treatment are offered by Valuck *et al.* [49], who conducted a retrospective longitudinal cohort study using insurance claim data for over 24 000 adolescents with newly diagnosed major depressive disorder. Youth treated with antidepressant medication for at least 6 months were significantly less likely to make a suicide attempt than those treated for 2 months or less, suggesting that an antidepressant treatment course in keeping with existing guidelines may be protective. However, a recently published meta-analysis of observational studies across the lifespan reports that SSRI antidepressants may decrease the risk of suicide in adults and the elderly, yet increase the risk in adolescents [50••]. Although these results are somewhat difficult to reconcile with other evidence [47,48] and the decision to prescribe an antidepressant to an adolescent could be a marker for greater illness severity in treated adolescents and thus a confounding factor, the study's worrisome findings suggest that large-scale trials may be necessary to satisfactorily answer this important question.

Service access

Despite the availability of effective treatments, most youth at risk for suicide receive inadequate treatment or no care at all [51]. Prior difficulties in accessing healthcare services were noted more often for suicide completers than individuals who died from accidents or other medical conditions, with less than a third of suicide completers receiving any mental health services and less than a fourth receiving antidepressants immediately prior to death [52]. A review by Luoma *et al.* [53] found that suicide completers were more likely to have contact with a PCC (45%) than a mental health specialist (19%) in the month prior to death. Contact with a healthcare professional was less likely for suicide completers younger than 35 years of age, with only 23% having seen a PCC and 15% a mental health clinician in the month prior to death. Studies focused on adolescent suicide completers report that no more than 20% have seen a mental health professional in the months prior to suicide [4,5]. Adolescent suicide completers may be less likely to access medical services than peers, with one study reporting that adolescents who were medically hospitalized following a serious suicide attempt were less likely to have a dedicated PCC than nonsuicidal youth and were more likely to use the emergency department for basic medical services [54].

In a related vein, despite concerns regarding the risk of suicidal thinking and behaviors shortly after the initiation of antidepressant treatment in youth, studies of completed suicide reveal that few victims have been taking antidepressants at the time of death. A recent study of pediatric suicides found detectable antidepressant levels at postmortem toxicological testing in only one of 41 youth who committed suicide in New York City between 1999 and 2002 [55]. A similar study noted that none of the 42 Danish youth who committed suicide between 1995 and 1999 had taken an SSRI within 2 weeks of their death [56]. Taken together with the population-based data above, the fact that these drugs are so rarely found on toxicological examination of youth after suicide suggests that there may be a mismatch between concerns generated in relation to the FDA warning and any realistic public health threat.

Parental beliefs about treatment are also of importance in relation to accessing care. A recent study that examined the beliefs of parents of children in specialty mental health care found that psychotherapy was perceived as beneficial and having few risks in the treatment of depression, whereas antidepressants were perceived as both beneficial and risky [57•]. Interestingly, greater perceived benefits of antidepressants predicted future medication management appointments. Parental concerns with little clinical or empirical support, such as fears that antidepressants are addictive, were also identified. African–American parents perceived antidepressants as less beneficial and more risky relative to other parents.

Conclusion

Review of the existing literature across the lifespan and in children and adolescents offers considerable support for youth suicide prevention strategies that target improving access to effective services. Although the preponderance of evidence is ecological in nature, thus making causal inference difficult, existing population-based findings quite consistently show that markers of health service access and mental health service availability are inversely correlated with youth suicide rates over time and space. The public health importance of youth suicide makes existing evidence, however imperfect from the scientific perspective, difficult to ignore. A public health crisis as real and profound as pediatric suicide demands that organized healthcare and society, in general, take reasonable action based on the best available evidence. As such,

any public health relevant strategy to prevent youth suicide must include efforts to increase access to evidence-based treatments for mental disorders associated with heightened suicide risk, with pediatric depressive disorders appearing to be the most productive initial target.

Shifts in service delivery following the FDA 'black box' warning regarding pediatric antidepressant use have likely combined with shortages of pediatric mental health professionals, particularly in rural and low-income regions, and stigma to increase an already daunting public health challenge. Most youth at risk for suicide receive no mental health services at all, making efforts to better educate patients, families, and professionals dedicated to caring for children, such as PCCs and educators, particularly important. Serious efforts to improve access to care must also confront deficiencies in quality care, particularly access to evidence-based psychotherapy as well as pharmacological interventions. Given the geographic and workforce challenges to mental health service delivery, novel uses of technology and a focus on integrating mental health services into primary care deserve special attention. Additional research on the relationship between specific treatments, especially antidepressants, and youth suicide risk reduction is desperately needed.

Acknowledgements

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References and recommended reading

Papers of particular interest, published within the annual period of review, have been highlighted as:

- • of special interest
- •• of outstanding interest

Additional references related to this topic can also be found in the Current World Literature section in this issue (p. 688).

1 • Bridge JA, Greenhouse JB, Weldon AH, *et al.* Suicide trends among youths aged 10 to 19 years in the United States, 1996–2005. JAMA 2008; 300: 1025–1026.

This study demonstrates that recently observed increases in the suicide rate from 2003 to 2004 among US youth aged 10–19 years were unlikely to be single-year anomalies.

2 Gould MS, Greenberg T, Velting DM, Shaffer D. Youth suicide risk and preventive interventions: a review of the past 10 years. J Am Acad Child Adolesc Psychiatry 2003; 42:386–405.

3 Bridge JA, Goldstein TR, Brent DA. Adolescent suicide and suicidal behavior. J Child Psychol Psychiatry 2006; 47:372–394.

4 Brent DA, Perper JA, Moritz G, *et al.* Psychiatric risk factors for adolescent suicide: a case-control study. J Am Acad Child Adolesc Psychiatry 1993; 32:521–529.

5 Shaffer D, Gould MS, Fisher P, *et al.* Psychiatric diagnosis in child and adolescent suicide. Arch Gen Psychiatry 1996; 53:339–348.

6 US Department of Health and Human Services. National strategy for suicide prevention: goals and objectives for action. Rockville, Maryland: US DHHS, Public Health Service; 2001.

7 Gunnell D, Saperia J, Ashby D. Selective serotonin reuptake inhibitors (SSRIs) and suicide in adults: meta-analysis of drug company data from placebo controlled, randomized controlled trials submitted to the MHRA's safety review. BMJ 2005; 330:335.

8 Khan A, Khan S, Kolts R, Brown WA. Suicide rates in clinical trials of SSRIs, other antidepressants, and placebo: analysis of FDA reports. Am J Psychiatry 2003; 160:790–792.

9 Baldessarini RJ, Tondo L, Davis P, *et al.* Decreased risk of suicides and attempts during long-term lithium treatment: a meta-analytic review. Bipolar Disord 2006; 8 (5 Pt 2):625–639.

10 Guzzetta F, Tondo L, Centorrino F, Baldessarini RJ. Lithium treatment reduces suicide risk in recurrent major depressive disorder. J Clin Psychiatry 2007; 68:380–383.

11 Hennen J, Baldessarini RJ. Suicidal risk during treatment with clozapine: a meta-analysis. Schizophr Res 2005; 73:139–145.

12 Meltzer HY, Alphs L, Green AI, *et al.* Clozapine treatment for suicidality in schizophrenia: International Suicide Prevention Trial (InterSePT). Arch Gen Psychiatry 2003; 60:82–91.

13 Brown GK, Ten Have T, Henriques GR, *et al.* Cognitive therapy for the prevention of suicide attempts: a randomized controlled trial. JAMA 2005; 294:563–570.

14 Linehan MM, Comtois KA, Murray AM, *et al.* Two-year randomized controlled trial and follow-up of dialectical behavior therapy vs therapy by experts for suicidal behaviors and borderline personality disorder. Arch Gen Psychiatry 2006; 63:757–766.

15 • Tarrier N, Taylor K, Gooding P. Cognitive-behavioral interventions to reduce suicide behavior. Behav Modif 2008; 32:77–108.

A systematic review and meta-analysis of 28 studies examining the impact of CBT on suicidality.

16 Brent DA, Holder D, Kolko D, *et al.* A clinical psychotherapy trial for adolescent depression comparing cognitive, family, and supportive therapy. Arch Gen Psychiatry 1997; 54:877–885.

17 Harrington R, Fudge H, Rutter M, *et al.* Adult outcomes of childhood and adolescent depression. II: Psychiatric status. Arch Gen Psychiatry 1990; 47:465–473.

18 Wood A, Trainor G, Rothwell J, *et al.* Randomized trial of group therapy for repeated deliberate self-harm in adolescents. J Am Acad Child Adolesc Psychiatry 2001; 40:1246–1253.

19 Huey SJ Jr, Henggeler SW, Rowland MD, *et al.* Multisystemic therapy effects on attempted suicide by youths presenting psychiatric emergencies. J Am Acad Child Adolesc Psychiatry 2004; 43:183–190.

20 Donaldson D, Spirito A, Esposito-Smythers C. Treatment for adolescents following a suicide attempt: results of a pilot trial. J Am Acad Child Adolesc Psychiatry 2005; 44:113–120.

21 Rotheram-Borus MJ, Piacentini J, Cantwell C, *et al.* The 18-month impact of an emergency room intervention for adolescent female suicide attempters. J Consult Clin Psychol 2000; 68:1081–1093.

22 Spirito A, Boergers J, Donaldson D, *et al.* An intervention trial to improve adherence to community treatment by adolescents after a suicide attempt. J Am Acad Child Adolesc Psychiatry 2002; 41:435–442.

23 March J, Silva S, Petrycki S, *et al.* Fluoxetine, cognitive-behavioral therapy, and their combination for adolescents with depression: Treatment for Adolescents With Depression Study (TADS) randomized controlled trial. JAMA 2004; 292:807–820.

24 March JS, Silva S, Petrycki S, *et al.* The Treatment for Adolescents with Depression Study (TADS): long-term effectiveness and safety outcomes. Arch Gen Psychiatry 2007; 64:1132–1143.

25 •• Brent D, Emslie G, Clarke G, *et al.* Switching to another SSRI or to venlafaxine with or without cognitive behavioral therapy for adolescents with SSRI-resistant depression: the TORDIA randomized controlled trial. JAMA 2008; 299:901–913.

A landmark study of treatment options for depressed youth who failed one trial of SSRI antidepressant treatment.

26 •• Vitiello B, Silva SG, Rohde P, *et al.* Suicidal events in the Treatment for Adolescents with Depression Study (TADS). J Clin Psychiatry 2009; 70:741–747.

An examination of suicidal events and their correlates from the important and influential TADS.

27 •• Brent DA, Emslie GJ, Clarke GN, *et al.* Predictors of spontaneous and systematically assessed suicidal adverse events in the treatment of SSRI-resistant depression in adolescents (TORDIA) study. Am J Psychiatry 2009; 166:418–426.

An examination of suicidal adverse events that emerged during the TORDIA study.

28 Mann JJ, Apter A, Bertolote J, *et al.* Suicide prevention strategies: a systematic review. JAMA 2005; 294:2064–2074.

29 •• Alexopoulos GS, Reynolds CF, Bruce ML, *et al.* Reducing suicidal ideation and depression in older primary care patients: 24-month outcomes of the PROSPECT study. Am J Psychiatry 2009. [Epub ahead of print]

Reports on 2-year follow-up from the Prevention of Suicide in Primary Care Elderly: Collaborative Trial (PROSPECT), which evaluated the impact of a care management intervention on suicidal ideation and depression in older primary care patients.

30 Bruce ML, Ten Have TR, Reynolds CF 3rd, *et al.* Reducing suicidal ideation and depressive symptoms in depressed older primary care patients: a randomized controlled trial. JAMA 2004; 291:1081–1091.

31 Asarnow JR, Jaycox LH, Duan N, *et al.* Effectiveness of a quality improvement intervention for adolescent depression in primary care clinics: a randomized controlled trial. JAMA 2005; 293:311–319.

32 •• Pirkola A, Sund R, Sailas E, Wahlbeck K. Community mental-health services and suicide rate in Finland: a nationwide small-area analysis. Lancet 2009; 373:147–153.
This study examined the relationship between suicide risk and different configurations of community mental health services in Finland.

33 De Leo D, Buono MD, Dwyer J. Suicide among the elderly: the long-term impact of a telephone support and assessment intervention in northern Italy. Br J Psychiatry 2002; 181:226–229.

34 •• Fleischmann A, Bertolote JM, Wasserman D, *et al.* Effectiveness of brief intervention and contact for suicide attempters: a randomized controlled trial in five countries. Bull World Health Organ 2008; 86:703–709.
Reports on an international and multisite study sponsored by the World Health Organization that explored whether a brief intervention with ongoing contacts following a suicide attempt could prevent suicide deaths relative to treatment as usual. This study randomized 1867 suicide attempters and demonstrated that a brief and low-cost intervention significantly reduced deaths by suicide compared with usual care in low and middle-income countries.

35 • Kapusta ND, Niederkrotenthaler T, Etzersdorfer E, *et al.* Influence of psychotherapist density and antidepressant sales on suicide rates. Acta Psychiatr Scand 2009; 119:236–242.
The above is a European study that found antidepressant sales and the population density of psychotherapists to be negatively associated with suicide rates.

36 Tondo L, Albert MJ, Baldessarini RJ. Suicide rates in relation to healthcare access in the United States: an ecological study. J Clin Psychiatry 2006; 67:517–523.

37 Cooper SL, Lezotte D, Jacobellis J, *et al.* Does availability of mental health resources prevent recurrent suicidal behavior? An ecological analysis. Suicide Life Threat Behav 2006; 36:409–417.

38 Gibbons RD, Hur K, Dulal K, *et al.* The relationship between antidepressant medication use and rate of suicide. Arch Gen Psychiatry 2005; 62:165–172.

39 • Isacsson G, Holmgren A, Osby U, Ahlner J. Decrease in suicide among the individuals treated with antidepressants: a controlled study of antidepressants in suicide, Sweden 1995–2005. Acta Psychiatr Scand 2009; 120:37–44.
This study reports on time trends in the detection of antidepressants and five 'control medications' in the forensic toxicological screening of 16 937 suicides and 33 426 controls in Sweden over a 10-year period, supporting the study hypothesis that the increased use of antidepressants has contributed to reductions in completed suicide.

40 • Ludwig J, Marcotte DE, Norberg K. Antidepressants and suicide. J Health Econ 2009; 28:659–676.
This study examined variations in SSRI sales in relation to those of other drugs and the rate of suicide in 26 countries, concluding that SSRIs are responsible for quantifiable reductions in the suicide rate.

41 Hammad TA, Laughren T, Racoosin J. Suicidality in pediatric patients treated with antidepressant drugs. Arch Gen Psychiatry 2006; 63:332–339.

42 Bridge JA, Iyengar S, Salary CB, *et al.* Clinical response and risk for reported suicidal ideation and suicide attempts in pediatric antidepressant treatment: a meta-analysis of randomized controlled trials. JAMA 2007; 297:1683–1696.

43 Gibbons RD, Brown CH, Hur K, *et al.* Early evidence on the effects of regulators' suicidality warnings on SSRI prescriptions and suicide in children and adolescents. Am J Psychiatry 2007; 164:1356–1363.

44 Libby AM, Brent DA, Morrato EH, *et al.* Decline in treatment of pediatric depression after FDA advisory on risk of suicidality with SSRIs. Am J Psychiatry 2007; 164:884–891.

45 • Katz LY, Kozyrskyj AL, Prior HJ, *et al.* Effect of regulatory warnings on antidepressant prescription rates, use of health services and outcomes among children, adolescents and young adults. CMAJ 2008; 178:1005–1011.
This study addresses the question of whether concerns regarding pediatric antidepressant use following the actions of regulatory agencies may have had unintended public health consequences.

46 • Olfson M, Marcus SC, Druss BG, *et al.* Effects of Food and Drug Administration warnings on antidepressant use in a national sample. Arch Gen Psychiatry 2008; 65:94–101.
This study reports on changes in antidepressant prescription rates in the wake of the FDA warnings on antidepressant use.

47 Olfson M, Shaffer D, Marcus SC, Greeberg T. Relationship between antidepressant medication treatment and suicide in adolescents. Arch Gen Psychiatry 2003; 60:978–982.

48 Gibbons RD, Hur K, Dulal K, *et al.* The relationship between antidepressant prescription rates and rate of early adolescent suicide. Am J Psychiatry 2006; 163:1898–1904.

49 Valuck RJ, Libby AM, Sills MR, *et al.* Antidepressant treatment and risk of suicide attempt by adolescents with major depressive disorder: a propensity-adjusted retrospective cohort study. CNS Drugs 2004; 18: 1119–1132.

50 •• Barbui C, Esposito E, Cipriani A. Selective serotonin reuptake inhibitors and risk of suicide: a systematic review of observational studies. CMAJ 2009; 180:291–297.
A systematic review of observational studies of the relationship between SSRI exposure and suicide completions or attempts in youth, adults, and the elderly.

51 Kessler RC, Berglund P, Borges G, *et al.* Trends in suicide ideation, plans, gestures, and attempts in the United States, 1990–1992 to 2001–2003. JAMA 2005; 293:2487–2495.

52 Miller CL, Druss B. Datapoints: suicide and access to care. Psychiatr Serv 2001; 52:1566.

53 Luoma JB, Martin CE, Pearson JL. Contact with mental health and primary care providers before suicide: a review of the evidence. Am J Psychiatry 2002; 159:909–916.

54 Slap GB, Vorters DF, Chaudhuri S, Centor RM. Risk factors for attempted suicide during adolescence. Pediatrics 1989; 84:762–772.

55 Leon AC, Marzuk PM, Tardiff K, *et al.* Antidepressants and youth suicide in New York City, 1999–2002. J Am Acad Child Adolesc Psychiatry 2006; 45:1054–1058.

56 Søndergård L, Kvist K, Andersen PK, Kessing LV. Do antidepressants precipitate youth suicide? A nationwide pharmacoepidemiological study. Eur Child Adolesc Psychiatry 2006; 15:232–240.

57 • Stevens J, Wang W, Fan L, *et al.* Parental attitudes toward children's use of antidepressants and psychotherapy. J Child Adolesc Psychopharmacol 2009; 19:289–296.
This study explores the attitudes of parents in an outpatient mental health clinic regarding the risks and benefits of both psychotherapy and antidepressants for depressed youth.