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Katie A. McLaughlin

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The Public Health Impact of Major Depression: A Call for Interdisciplinary Prevention Efforts

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Abstract Major depression is a consequential public health problem in the United States. Depression has long been recognized as an important target of intervention in psychology and psychiatry, but these fields have focused efforts primarily on treatment rather than prevention. Although effective preventive interventions targeting high-risk groups have been developed, they have thus far had poor reach and sustainability in the community. The development of sustainable preventive interventions that have the potential to impact population health represents a critical goal for the field. To this end, a research agenda incorporating the perspectives of both mental health disciplines and public health is proposed as a guide for future depression prevention research. Increased interdisciplinary collaboration between mental health disciplines and public health is recommended to develop, enact, and evaluate multilevel preventive interventions aimed at reducing the population health burden of major depression.

Keywords Prevention · Depression · Interdisciplinary · Public health · Population health

Major depression is a prevalent and disabling condition that constitutes an important public health problem in the United States. This growing problem has been identified by numerous organizations as among the largest health-care priorities in the country (Healthy People 2020, 2010; U.S. Department of Health and Human Services 2000). To date, mental health interventions for depression have focused almost exclusively on an individual treatment approach. Recent efforts to develop preventive interventions for depression have been successful (e.g., Gillham et al. 1995; Clarke et al. 2001) and suggest that depression is amenable to a public health approach to disease prevention. Although the contribution of depression to disability in the population is recognized as an important public health concern (e.g., Murray and Lopez 2002), depression has been largely ignored as a target of public health intervention. Moreover, although the recent success of indicated and selective prevention programs in clinical psychology is encouraging, substantial progress must be made to develop preventive interventions that are sustainable and accessible to larger segments of the population. To this end, increased collaboration between mental health disciplines and public health is recommended to enact a multilevel approach to the prevention of depression (see Fig. 1). This review first highlights the public health impact of major depression. Recommendations for developing preventive interventions that capitalize on the strengths of mental health and public health approaches to prevention are presented along with strategies for increasing interdisciplinary collaboration.

K. A. McLaughlin (✉)
Division of General Pediatrics, Children's Hospital Boston,
Harvard Medical School,
300 Longwood Avenue,
Boston, MA 02115, USA
e-mail: katie.mclaughlin@childrens.harvard.edu

Epidemiology of Depression

Prevalence and Course

Depression is one of the most common manifestations of psychological distress in Western societies. Depression is the single most common mental disorder in the United States. National surveys estimate that approximately 16–17% of U.S. adults and 11–12% of adolescents have experienced a major depressive episode at least once in

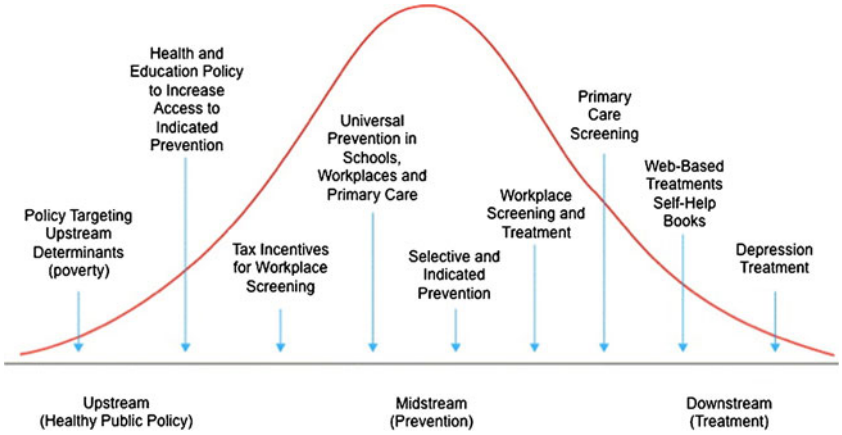

Fig. 1 Adapted from McKinlay and Marceau's (2000) points of intervention for a public-health approach to diabetes

their life (Kessler et al. 1994, 2003; Merikangas et al. 2010). Depression is a chronic illness. Nearly three-quarters of individuals who have experienced a major depressive episode will experience multiple episodes, and the risk of recurrence increases substantially with each subsequent depressive episode while the time to recurrence decreases (Keller and Boland 1998; Kessler et al. 1997). The average number of depressive episodes experienced by individuals who have had at least one episode is four, with an average episode length of 30 weeks (Judd 1997; Soloman et al. 1997).

Functional Impairment

Depression is associated with significant impairment across numerous areas of functioning. National data suggest that virtually all depressed individuals experience disorder-related functional impairment, and nearly two-thirds experience severe impairment (Kessler et al. 2003; Merikangas et al. 2010). Even individuals who report mild impairment as a result of their depression experience increased perceptions of the need for medical care, utilize health services more often and are more likely to be hospitalized, are at greater risk of suicide, and are twice as likely to be unemployed as individuals without depressive symptoms (Mojtabai 2001).

Morbidity & Mortality

Depression is associated with elevated morbidity and mortality. Physical impairments of a similar magnitude as those found in chronic diseases such as diabetes and cancer have been observed in individuals with depression (Surtees et al. 2003). Prospective evidence shows that depression predicts subsequent myocardial infarction, exacerbates existing cardiovascular disease, and dramatically increases mortality following myocardial infarction and unstable angina (Barefoot and Schroll 1996; Frasure-Smith et al. 1993, 1995; Lespérance et al. 2000). Depression is also associated with elevated risk for stroke (Jonas and Mussolino 2000) and hypertension (Jonas et al. 1997). Perhaps the most significant consequence of depression is elevated mortality related to suicide. Depressed individuals are 11 times more likely to attempt suicide than those without the disorder (Kessler et al. 1999), and more than one in ten depressed individuals will attempt suicide at some point in their life (Office of Applied Studies 2006).

Economic and Social Consequences

Depression also has significant social and economic consequences. In 2000, the annual cost of major depression was estimated at $83.1 billion (Greenberg et al. 2003). Depression is associated with increased use of health resources, including increased primary and specialty care utilization visits (Ford et al. 2004). Individuals with depression lose 5.6 h of productive time at work per week compared to 1.6 h in non-depressed workers (Stewart et al. 2003), which results in 225 million lost workdays and $36.6 billion of salary-equivalent lost productivity per year associated with depression (Kessler et al. 2006). Findings from the Global Burden of Disease Study indicate that depression is one of the leading causes of disability in the world (Murray and Lopez 1996, 2002; World Health Organization 2001).

Prevention of Depression

Access to Treatment

Although effective psychosocial and pharmacological interventions for depression have been developed, many individuals with the condition never receive treatment. National data indicate that slightly more than half of adults with depression receive treatment of any kind for the disorder (Kessler et al 2003; Kessler and Walters 1998;

Wang et al. 2005). Depressed children and adolescents are considerably less likely to receive treatment than adults (Olfson et al. 1998, 2003); this is likely due at least in part to the fact that less than half of U.S. schools provide on-site counseling services, even though the majority of youths who use mental health services receive those services at school (Slade 2003). The proportion of individuals who receive *adequate* mental health treatment for depression is even lower. National surveys estimate that approximately one-third of depressed persons receive appropriate care (Wang et al. 2005; Young et al. 2001). Individuals who seek care from the general medical sector or complementary/alternative service providers are least likely to receive adequate care. These findings are troubling given that more than three-quarters of depressed individuals initially seek treatment from these sources (Young et al. 2001), and nearly one-third receive treatment only from these sectors (Wang et al. 2005).

Current State of Prevention

Depression is common, frequently chronic, and associated with substantial costs for individuals and for society. Efforts to prevent the onset of depression thus represent an important public health priority, particularly given the lack of access to effective treatments for many individuals. The Institute of Medicine (IOM) mental health framework differentiates three types of prevention for mental disorders (IOM 1994). *Universal* preventive interventions are intended for all individuals in the population, regardless of their risk status for a mental disorder. The benefits of universal preventive interventions should outweigh the risks for all individuals; these interventions are particularly effective when the cost is low and efficacy is high across large segments of the population. *Indicated* prevention efforts target individuals who are already manifesting early signs or symptoms of a mental disorder but who do not yet meet full diagnostic criteria. Indicated interventions may be warranted even if they involve higher costs and somewhat greater risk than universal interventions (IOM 1994). *Selective* prevention targets individuals considered to be at high risk for developing a particular mental disorder as based on the presence of an identified risk factor (e.g., parental depression). The recent IOM report on depression prevention also highlights the importance of universal public health approaches to promoting positive mental health, including efforts to improve diet, exercise, sleep quality, and social support (IOM 2009). Given the sparse research on the efficacy of these kinds of health promotion interventions in preventing depression, they are not reviewed in the current report.

A number of universal, indicated, and selective interventions have been developed to prevent the onset of depression, most of which have been targeted at adolescents. The nature and efficacy of these interventions is reviewed in greater detail elsewhere (Horowitz and Garber 2006; McLaughlin 2008). Meta-analysis of depression prevention programs shows that indicated and selective interventions are effective in preventing the onset of depressive symptomatology and have significantly greater benefits than universal interventions, although effect sizes are small in magnitude (Horowitz and Garber 2006; Merry et al. 2004; Stice et al. 2009). The indicated and selective prevention interventions that have been evaluated the most thoroughly are cognitive-behavioral in nature and include psychoeducation, social skills training, cognitive restructuring, and behavioral activation components (Beardslee et al. 1993; Clarke et al. 2001; Cuijpers et al. 2009; Gillham et al. 1995; Seligman et al. 1999). These interventions have been found to be effective both at preventing increases in depressive symptoms in adolescents at elevated risk for depression due to existing symptoms or family history and at preventing the onset of major depressive episodes (Beardslee et al. 1993; Clarke et al. 2001; Gillham et al. 1995; Jaycox et al. 1994; Seligman et al. 1999).

Universal preventive interventions have fared less well. Although universal interventions have been effective at reducing depression symptoms among adults in primary care (Muñoz et al. 1995) and in small school-based trials where researchers had good control over intervention delivery and implementation (Shochet et al. 2001; Spence et al. 2003), meta-analysis suggest that universal interventions have thus far had limited efficacy in reducing risk for the onset of major depression (Horowitz and Garber 2006; Merry et al. 2004; Stice et al. 2009). Larger universal prevention trials, even of interventions that have been found to be effective as indicated or selective interventions or in smaller universal prevention studies, have typically not been successful (Gillham et al. 2007; Sheffield et al. 2006).

Although the efficacy of indicated and selective preventive interventions in preventing depression is heartening, these interventions are plagued by many of the same problems as treatment in that they are expensive, time-consuming, and unavailable to large segments of the population. Research has shown that we can prevent the onset of depression in high-risk groups, but sustainable implementation and dissemination of prevention programs in the community has thus far been lacking. The recent efforts to develop universal interventions are encouraging, because such interventions are potentially more sustainable and may have greater effects on population mental health. However, until the efficacy of such interventions is improved, population-level prevention will not be possible.

Prevention Research Agenda

Given the current limitations in the extent to which current approaches to the prevention of depression can impact population health, a new agenda for prevention research is proposed that incorporates the perspectives of both mental health disciplines and public health. This agenda aims to shape research on the development and evaluation of preventive interventions for depression based on a public health model that utilizes a multilevel approach to disease prevention (see Fig. 1). The aims of this agenda are to develop, evaluate, and implement interventions that will lead to reductions in the incidence of depression and associated disability in the population. This research agenda combines the contributions of clinical psychology and psychiatry to the development of preventive interventions for depression with a public health approach to intervention implementation and dissemination and a focus on upstream determinants of depression.

Goal 1 The first goal of this agenda is to improve the efficacy of universal preventive interventions. Such interventions have the potential to influence a large population of individuals at risk of developing depression. This type of prevention is most useful for disorders in which a much larger proportion of the population is at-risk for developing the disorder than the proportion that already has the disorder (e.g., McKinlay and Marceau 2000). Depression is thus an excellent candidate for such interventions.

Universal prevention has several benefits over indicated and selective prevention that justify targeting larger unselected samples of individuals. The first advantage involves sustainability and community implementation. Indicated prevention programs are typically delivered by mental health professionals (e.g., Clarke et al 2001) because trained professionals may adhere more effectively to intervention manuals than other intervention deliverers. Unfortunately, using highly trained professionals reduces the likelihood that the intervention will actually be implemented in the community once the research trial is over (Glasgow et al. 2003), largely due to the greater costs associated with using such professionals. In contrast, interventions that are implemented by existing providers (e.g., teachers, school counselors) or bundled with delivery of other health services (e.g., Muñoz et al. 1995) and are readily transportable to other settings are more likely to be sustained if they are demonstrated to be effective. Universal prevention for depression is also potentially less expensive than indicated or selective prevention, not only because using existing providers is less expensive than hiring mental health professionals to deliver the intervention, but also because these interventions do not require screening to determine eligibility for the intervention. Screening is a costly process. For example, a cost-effectiveness study of a selective preventive intervention reported that the screening costs associated with the identification of 123 eligible participants totaled $45,213 (Lynch et al. 2005). If the goal of prevention is to improve population health, preventive interventions must be cost-effective, transportable to a variety of settings, and deliverable without the need for highly trained professionals.

School- and technology-based (i.e., internet-delivered) approaches to the prevention of depression hold much promise in terms of sustainability, because these approaches are inexpensive and do not rely on trained professionals to administer the intervention. However, school-based prevention has yet to live up to this promise. Poor teacher adherence to intervention materials in school-based prevention studies has diminished the impact of depression prevention programs in school settings. In studies that have not found universal prevention programs to be effective, lack of adherence to the intervention among teachers is one potential explanation for lack of efficacy (Gillham et al. 2007; McLaughlin 2008; Sheffield et al. 2006). Future efforts to develop school-based universal interventions must modify the intervention components or delivery methods in ways that facilitate better adherence to the intervention techniques. Technology-based approaches represent the most promising avenue in this regard given that these approaches allow interventions to be delivered exactly as they are intended to be delivered. Evidence suggests that internet-based approaches to intervention delivery can be as effective as those delivered by clinicians and can reach substantial numbers of people for low cost (Andersson et al. 2006; Muñoz et al. 2006; van Straten 2008). Internet-based preventive interventions for depression have the potential to solve the problems related to poor adherence to intervention techniques in universal prevention. Indeed, an effective selective prevention program was recently adapted for delivery entirely over the Internet. A randomized controlled trial of the intervention found significant ameliorative effects on depressive symptoms compared to a treatment as usual condition, with a small intervention effect size among all participants and a moderate effect size among women (Clarke et al. 2009). This study shows that cognitive-behavioral preventive interventions can be effectively adapted for Internet delivery, resulting in a low-cost intervention that can easily be disseminated to a large number of people. These findings highlight the feasibility of using technology to increase the public health impact of depression prevention programs.

A final advantage of universal prevention is that it targets a larger population of individuals at risk; those individuals at highest risk, who would be targeted by indicated and selective prevention, receive a full dose of the intervention while those at lower levels of risk are also

included. This is important for two reasons. First, and most obviously, universal preventive interventions result in a larger number of people receiving the intervention. Second, individuals who are at high risk for depression but are not identified by screening efforts are included. This is a likely scenario, given that our ability to identify individuals experiencing depression is far from perfect. Screening instruments are frequently inaccurate in identifying individuals who have a diagnosis of depression (Dierker et al. 2001; Patton et al. 1999), and our ability to identify high-risk individuals who should be targeted by indicated prevention is undoubtedly even poorer. Because we cannot accurately predict which individuals will develop depression, targeting preventive interventions at a large segment of the population is warranted. In this way, universal interventions might usefully be thought of as a vehicle for reaching and delivering interventions to the high-risk subgroups of the population that are not included in existing prevention efforts. It should be noted that although universal interventions may be associated with fewer costs because screening is unnecessary, these savings might be offset by increased costs associated with delivering the intervention to a larger number of people.

Recent efforts to utilize effective indicated/selective prevention programs in universal prevention trials (e.g., Gillham et al. 2007; Sheffield et al. 2006) represent a first step towards actualizing the goal of developing effective universal preventive interventions. However, intervention strategies that are effective among high-risk populations may not have preventive effects in the broader population where individuals vary in their initial risk. For example, cognitive restructuring is a core technique in depression prevention programs and has been found to effectively prevent increases in depressive symptoms among adolescents who already exhibit high symptom levels in the absence of a depression diagnosis (see Jaycox et al. 1994; Gillham et al. 1995). Cognitive restructuring likely benefits this population because depressogenic cognitive biases and distortions are already present and responsible, at least in part, for their high levels of depressive symptoms. This same technique may not be beneficial for individuals with lower levels of depressive symptoms for whom such biases may not be present. Moreover, it is difficult to implement cognitive strategies to challenge maladaptive thoughts if such thoughts are not present. Behavioral techniques already included in most prevention programs, such as behavioral activation (Cuijpers et al. 2009), may have more relevance for individuals with low symptom levels, because these strategies can easily be implemented regardless of whether active symptoms are present. Behavioral activation seeks to increase engagement with activities, contexts, and interpersonal interactions that are positively reinforcing and that are consistent with one's long-term goals (Dimidjian et al. 2006). Behavioral activation strategies aim to increase engagement in pleasant, rewarding behaviors and activities (e.g., spending time with a supportive friend), and thus can be implemented effectively in individuals with and without depressive symptoms. Alternatively, it may be the case that an entirely different approach is required to prevent depression in asymptomatic individuals. Although most studies find that prevention programs are most effective for individuals with high levels of symptomatology (Stice et al. 2009), some universal prevention studies have shown that adolescents at low risk for depression benefit equally from preventive interventions as those at high risk (e.g., Cardemil et al. 2002). Together, these findings suggest that efforts to improve universal prevention should focus both on identifying the components of existing programs that are effective for low-risk individuals and *supplementing* effective strategies with techniques that are most relevant to individuals with low levels of symptoms, rather than developing entirely novel interventions.

Goal 2 The second goal for prevention research involves increasing the reach and sustainability of indicated and selective preventive interventions. Evidence from clinical trials indicates that such interventions are effective (e.g., Clarke et al. 2001). As such, a clear public health goal is to identify individuals at high risk for developing depression and deliver effective preventive interventions to those individuals. The most efficient method for accomplishing this goal is to combine depression screening with the administration of preventive interventions. The points of intervention that have the greatest potential for early identification and prevention are schools, workplaces, primary care clinics, and specialty clinics that serve populations in which depression is common (e.g., cardiology and endocrinology). Schools, particularly middle and high schools, represent logical points of intervention given that they provide access to a large number of adolescents. Because adolescents are at elevated risk for the development of depression (Hankin et al. 1998), adolescence is a developmental period in which screening and prevention efforts have the greatest likelihood of success in preventing first-onset depression. Not surprisingly, most studies examining the efficacy of prevention programs for depression have targeted adolescents (Clarke et al. 2001; Garber et al. 2009; Gillham et al. 1995). The prevalence of depression in primary and specialty care clinics tends to be higher than in the general population, and individuals presenting with these problems in primary care are often untreated or undertreated (e.g., McQuaid et al. 1999; Wang et al. 2005; Weiller et al. 1996). As such, these medical settings represent valuable targets for screening and intervention efforts in addition to schools. Workplaces, finally, are a relatively untapped resource for combining depression

screening and prevention. National data indicate that depression is common in the U.S. work force and is associated with substantial costs for employers (Kessler et al. 2006), and that screening and treatment of depression in workplaces is feasible and cost-effective (Wang et al. 2006). Adapting existing interventions to be administered within workplaces could substantially increase the reach of indicated prevention. Workplaces also provide an opportunity to improve the sustainability of indicated prevention, as described in greater detail below.

Increasing the sustainability of indicated and selective preventive interventions is also necessary. To date, effective indicated interventions have yet to be disseminated widely into the community. This trend may be shifting, as efforts to disseminate effective prevention programs have begun in Norway, Finland, and Costa Rica (Gladstone and Beardslee 2010) as well as in middle schools throughout the United Kingdom (Reivich and Gillham 2011). For example, the Penn Resiliency Program has been adapted for use in middle schools in the UK, and an ongoing project is evaluating the efficacy of this intervention when implemented on a wide scale in nearly 100 middle school classrooms across the UK (Reivich and Gillham 2011). A family-based intervention—the Family Talk Intervention—demonstrated to be effective in reducing psychopathology in children of parents with mood disorders in Finland (Solantaus et al. 2010) is currently being disseminated throughout Finland by training clinicians in the national health service to implement the intervention with families. This work is encouraging, but published reports on the success of these dissemination efforts have yet to appear in the literature and the sustainability of these programs remains unknown.

A potential reason for the lack of dissemination of effective prevention programs is that, in general, evidence-based medical treatments can take many years to implement, and preventive interventions likely take much longer given the lower utilization rate of these interventions among mental health professionals. The most likely explanation for the lack of widespread dissemination, however, is that they typically require the use of trained mental health professionals as intervention administrators (e.g., Clarke et al. 2001). The costs associated with paying such professionals to administer prevention programs in the community are high, and funding for such efforts is largely unavailable. Two solutions to this problem are possible. The first is to utilize non-mental health professionals who are able to adhere to intervention protocols. A study that utilized mental health professionals and paraprofessionals working in senior centers to deliver a depression prevention program found comparable intervention effects for both types of professionals (Thompson et al. 1983). These findings suggest that non-mental health professionals can effectively deliver preventive interventions, at least in certain intervention settings and with certain populations. An important factor to consider in designing interventions to be delivered by such professionals is the degree to which other demands of their position may interfere with intervention adherence. Teachers and nurses, for example, may have too many competing demands to devote the time and effort required to administer these sorts of interventions. Another important consideration is the type of training required to ensure effective intervention delivery. Although the nature of training will vary depending on the intervention delivery setting, training must minimally ensure understanding of the rationale underlying the use of core intervention techniques, competence and flexibility in applying those techniques, and the support and investment of those individuals who will deliver the intervention. The extent to which preventive interventions can be delivered effectively in different settings and with different types of administrators remains an important question to be examined in future studies. Importantly, the benefits associated with using these alternative strategies for implementing interventions must be balanced by the relative inexperience of non-mental health professionals in working with people exhibiting high levels of distress, handling mental health crises, and flexibly adapting interventions based on clinical needs.

Technology-based approaches to selective and indicated prevention provide a second clear solution to the problems of access and sustainability. These approaches are extremely low cost once the technology has been developed (Cuijpers et al. 2009), and evidence suggests that they are effective (Clarke et al. 2009). Moreover, they may increase the availability of individuals already working with populations of interest (e.g., teachers, school counselors, and primary care nurses) to perform screenings, rather than to serve as intervention administrators. Increased screenings performed by such individuals paired with the use of technology-based interventions could greatly improve the sustainability of prevention programs. At the same time, it will be important to carefully monitor outcomes associated with internet-based approaches. Although this method of delivery is likely to improve the reach and sustainability of preventive interventions, the lack of supervision by a professional with clinical training raises concerns about adverse events or inability to appropriately manage clinical care for individuals with high levels of symptoms. Recent efforts to deliver mental health treatment over the Internet have utilized a remote clinician to provide individualized feedback (Robinson et al. 2010), which may be a potential solution for expanding the reach of preventive interventions without compromising careful clinical monitoring.

Expanding prevention programs to target workplaces is a particularly promising strategy for increasing the sustain-

ability of preventive interventions. Employers have a strong financial incentive to prevent depression in their work force, given the substantial costs of depression to worker productivity (Kessler et al. 2006; Stewart et al. 2003). Recent evidence suggests that depression interventions delivered in work sites are associated with improvements in depressive symptoms and productivity, and that these interventions are cost-effective for employers (Wang et al. 2006, 2008). These findings are quite encouraging, as they suggest a financial benefit for employers who provide these interventions for their workers. Workplace interventions may therefore be the most sustainable in the long term, because a clear mechanism exists for covering the ongoing costs of depression prevention. Increasing efforts to disseminate depression prevention programs in the workplace is a critical goal for a population-based approach to preventing depression.

Goal 3 The final goal of a prevention research agenda involves targeting upstream determinants of depression that may be amenable to policy influences, consistent with a true public health model of disease prevention (Rose 1992). Here, the focus is not on targeting depression *per se*, but on reducing risk factors that shape the distribution of depression in the population. This approach is a clear departure from current mental health efforts to prevent depression, which are focused on proximal individual-level risk factors such as dysfunctional thoughts and attitudes. To illustrate with an example, most existing depression prevention efforts are comparable to treating hypertension as a strategy for preventing the onset of cardiovascular disease, whereas targeting population-level determinants of depression is comparable to preventing cardiovascular disease by seeking to improve diet and decrease physical inactivity in the population (Rose 1992). What are the population-level determinants of depression? These factors should be common, have strong associations with depression, and explain a substantial proportion of depression cases. One example is exposure to childhood adversity—including maltreatment and family violence. Child maltreatment and violence exposure is common, associated strongly with the onset of depression, and explains about one-quarter of all depression cases in the population (Afifi et al. 2008; Green et al. 2010). These findings suggest that preventing exposure to these childhood adversities could theoretically prevent the first onset of one in four cases of depression. Other potentially modifiable population-level determinants of depression are poverty, unemployment, and exposure to trauma and stressful life events (Brown and Moran 1997; Dooley et al. 1996; Kessler 1997).

Targeting these upstream determinants of depression holds the most promise for reducing the incidence of the disorder in the population, yet such an approach is currently not a component of mental health efforts to prevent depression. This is most likely due to the fact that individual patterns of thought, behavior, and emotion regulation—the targets of most mental health interventions—are not the primary focus. Rather, the goal of such an approach is to alter the social, economic, and structural factors that give rise to depression and thereby modify the distribution of risk factors for depression at a population level. Mental health professionals have a role to play in such an approach, however. Although the distribution of population-level determinants of depression may be altered most effectively through policy change, public health efforts to reduce exposure to these risk factors rely heavily on community- and individual-level interventions, which would benefit from increased engagement by mental health professionals. For example, public health efforts to reduce exposure to child maltreatment have focused on altering community norms, such as increasing collective responsibility for child protection and altering beliefs about effective parenting practices (Prinz et al. 2009), and increasing access to individualized services that support families, such as early child care and education (Dodge et al. 2004; Seitz et al. 1985). Such interventions require the involvement of mental health professionals for implementation, evaluation, and dissemination, and provide an opportunity for successful collaboration between mental health and public health professionals. A recent evaluation of a systems-oriented intervention aimed at improving the capacity of early care and education programs to serve the needs of families experiencing depression and adversity provides an extraordinarily promising template for applying such an approach to depression prevention more directly (Beardslee et al. 2010). The intervention trained early care providers in Head Start and other child care centers to address the needs of families experiencing parental depression and provided supplemental mental health consultation for families. The intervention was accepted, implemented, and sustained by early care providers and had a number of benefits for providers, parents, and children engaged in these services (Beardslee et al. 2010).

The Need for Interdisciplinary Efforts

A comprehensive approach to the prevention of depression must include interventions targeting individual, community, and structural determinants. The implementation of such an approach requires the skills and theoretical perspectives of both mental health and public health professionals (Institute of Medicine 2009). Yet collaboration across these fields is currently quite limited. Perhaps the most formidable barrier to such collaboration is that mental health disciplines are concerned with the treatment of individuals whereas public

health is concerned with the prevention of disease in populations; this discrepancy generates a considerable divergence in the targets of intervention and the determination of intervention efficacy. Whereas the effects of mental health interventions are measured within individuals, the primary tenet of public health intervention is that "a measure that brings large benefits to the community offers little to each participating individual," (Rose 1981, p. 282). Mental health and public health disciplines thus have different overarching goals and theoretical and methodological approaches that must be bridged to foster effective collaboration. This challenge is relevant not only to depression prevention, but to efforts to prevent the onset of psychiatric disorders more broadly.

In order to facilitate collaboration between these disciplines to enact the prevention goals outlined in the previous section, several recommendations are provided. Mental health professionals must play a primary role in achieving the first goal of improving the efficacy of universal preventive interventions. Determining whether interventions targeting individual-level determinants (e.g., cognitive distortions) can reduce the likelihood of depression onset in individuals who are asymptomatic and whether existing cognitive-behavioral strategies represent the best approach to do so remains a critical issue for depression prevention research that mental health professionals are best suited to address. However, universal prevention research faces challenges that could best be addressed by incorporating public health methods. First, it is difficult to design and implement studies that can make firm conclusions about the efficacy of universal interventions because of the need to utilize large enough sample sizes and long enough follow-up periods to be able to detect preventive effects if they do, in fact, exist. Second, universal prevention has the potential to impact population-level depression while having few measurable effects for any individual (Rose 1992). Public health professionals have a role to play in both regards by aiding mental health professionals in evaluating the effects of universal preventive interventions at a community or population level. This might be accomplished by linking prevention implementation to ongoing national tracking surveys like the National Health and Nutrition Examination Survey or the Youth Risk Behavior Surveillance System (see www.cdc.gov). Such collaboration could allow mental health professionals to implement an intervention in a school system or community and to utilize national tracking data to examine depression rates in the targeted population over protracted periods of time without incurring the high costs associated with evaluating individual-level outcomes.

Mental health and public health professionals share equal responsibility for the goal of expanding the reach and sustainability of selective and indicated interventions. The focus here must be on successfully transitioning from efficacy to effectiveness research. Increasing evidence suggests that depression *treatments* can be implemented successfully in community mental health settings, albeit with weaker effects than in controlled clinical trials (Weersing et al. 2006; Weersing and Weisz 2002). A similar approach to dissemination and community implementation should be enacted to increase access to effective depression prevention programs. An influential public health model argues that real world intervention impact involves both *efficacy* and *reach* (Glasgow et al. 2003). Effective depression prevention programs have accomplished the former but not the latter. Although attempts to extend the reach of effective depression prevention programs are ongoing in the UK, Norway, Finland, and Costa Rica (Gladstone and Beardslee 2010; Reivich and Gillham 2011; Solantaus et al. 2010), the success of these efforts remains unknown. Improving reach requires developing interventions that are accessible to large numbers of people, can be implemented in a wide range of settings by people with varying expertise and training, and result in consistent and lasting effects on depression (Glasgow et al. 2003). Such interventions have been developed in public health, such as for smoking cessation (Prochaska et al. 2001). Collaboration between public health professionals who have succeeded in transitioning from efficacy to effectiveness intervention research and mental health professionals with expertise in depression prevention represents the most promising avenue for actualizing this goal.

Effective targeting of upstream determinants of depression is most likely to be enacted through public health approaches. Public health efforts to change communities and other contexts that shape health and to enact policies that modify social determinants of health require a skill set in epidemiology, economics, and public policy that differs in fundamental ways from the skills that are the focus of mental health training. However, because upstream determinants of health like poverty and childhood adversity are associated with a wide range of health outcomes (Adler and Ostrove 1999; Felitti et al. 1998), efforts to implement structural and policy changes to target these factors are not likely to be focused specifically on preventing depression and other mental disorders. Mental health professionals thus must ensure that the effects of such interventions on depression are evaluated. A recent systems intervention aimed at improving the ability of early child care providers to address familial depression and adversity (Beardslee et al. 2010) shows that mental health professionals also have a role to play in enhancing and supplementing existing community services to focus more specifically on the mental health needs of families.

The unique contributions of mental health disciplines and public health are necessary to adequately implement a true multilevel approach to the prevention of depression.

We have good evidence that mental health and public health collaborations are feasible. For example, these fields came together to assess the psychological effects of Hurricane Katrina and the terrorist attacks of September 11th and to deliver mental health services to individuals in need (Cohen et al. 2009; Felton 2002). Efforts to increase interdisciplinary collaboration and to balance upstream and downstream approaches will undoubtedly lead to the development and dissemination of interventions that have the greatest chance of improving population health. Such collaboration holds great potential to stem the growing burden of depression and should be encouraged and facilitated by individual researchers, research institutions, and funding agencies.

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