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Mental disorders and medical comorbidity

See companion Policy Brief available at *www.policysynthesis.org*

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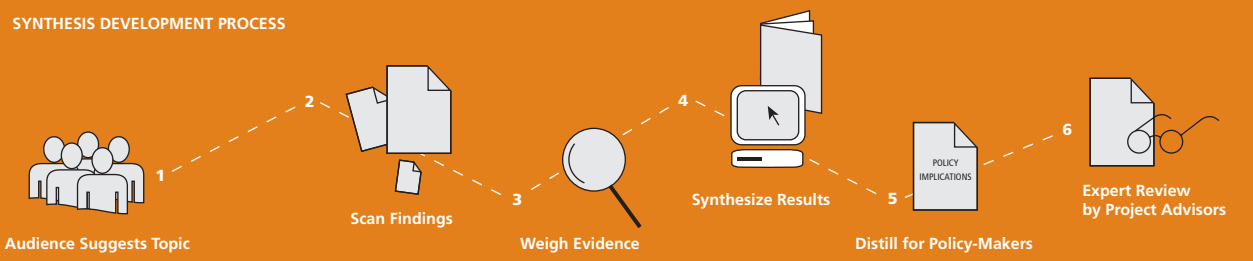
THE SYNTHESIS PROJECT (Synthesis) is an initiative of the Robert Wood Johnson Foundation to produce relevant, concise, and thought-provoking briefs and reports on today's important health policy issues. By synthesizing what is known, while weighing the strength of findings and exposing gaps in knowledge, Synthesis products give decision-makers reliable information and new insights to inform complex policy decisions. For more information about the Synthesis Project, visit the Synthesis Project's Web site at *www.policysynthesis.org*. For additional copies of Synthesis products, please go to the Project's Web site or send an e-mail request to *pubsrequest@rwjf.org*.



Introduction

In the wake of the passage of national health reform, the nation is focusing its efforts on how to improve quality and efficiency within the health care system. However, expenditures and gaps in care delivery are not evenly distributed throughout the population; only 5 percent of the population account for half of all health care spending (138) and there is considerable variation in quality of care across different conditions and settings (106). Therefore, achieving the goals of improved quality and efficiency will require focusing specifically on subgroups most at risk for high costs and poor quality of care (113).

This synthesis presents evidence that persons with comorbid mental and medical conditions represent just such a population. Based on epidemiological data from the 2001–2003 National Comorbidity Survey Replication, 34 million American adults, or 17 percent of the adult population, had comorbid mental and medical conditions within a 12-month period (3, 146). The high prevalence of this comorbidity, the complex causal connections linking medical and mental health conditions, and system fragmentation lead to problems in quality and costs related to comorbidity that are commonly even more complicated and burdensome than the problems related to the individual conditions themselves. While evidence-based treatments exist for improving care for this population, they typically are not used in routine settings. Under health reform, millions of uninsured persons with mental disorders will move into the formal health system, in particular the Medicaid program, making efforts to improve quality and efficiency of care for this population an even higher priority.

This synthesis provides an overview of medical and mental comorbidity, with an eye towards current federal health reform efforts. It addresses the following questions:

1. What is the rate of comorbidity between medical and mental conditions and why is it so common?
2. What are the associated mortality, quality of care, and cost burdens of comorbidity?
3. What are the current evidence-based approaches for addressing comorbidity?

Methodology

A literature review and analysis was conducted using standardized approaches for systematic reviews of the peer-reviewed literature (69). Quality of evidence was assessed based on internal validity (e.g., study design) as well as external validity (e.g., the degree to which the findings can be broadly applied). Review articles and meta-analyses received particular attention. We assumed that epidemiological associations and mechanisms linking mental and medical disorders would be relatively stable over time, and therefore included older studies in these sections; cost and service use data were considered to be more time-sensitive, and therefore these sections focused on more recent data.

Given the limitations of peer-reviewed data for policy syntheses (97) (e.g., lack of timeliness, bias towards positive findings), grey literature including commissioned reports, white papers and legislation also were reviewed. Data were supplemented with discussions with key administrators and policy-makers.

For the purposes of this report, comorbidity is defined broadly as the co-occurrence of mental and physical disorders in the same person, regardless of the chronological order in which they occurred or the causal pathway linking them (52, 147, 148). Mental disorders include a spectrum of conditions, such as depression, anxiety disorders, schizophrenia and bipolar disorder. This review focuses on adults; there are differences in treatments, providers and systems where children with comorbid mental and medical conditions receive their care.

Comorbidity – the co-occurrence of mental and physical disorders in the same person, regardless of the chronological order in which they occurred or the causal pathway linking them.

Mental disorders cannot be diagnosed with biological tests, unlike many medical conditions, and thus case definition relies on diagnostic criteria. In the research literature, mental disorders are often measured through self-report, health utilization data, symptom- or criteria-based scales, or clinical interviews (see Text Box below). Self-report and claims-based analyses generally capture those individuals who have been treated for a particular disorder, whereas symptom-based studies identify individuals who meet criteria for a mental disorder regardless of whether they have been treated. Given the fact that fewer than one-third of individuals meeting criteria for a mental disorder receive treatment (86), this distinction is particularly important for this group of conditions. Additionally, prevalence estimates of mental disorders will differ depending on the time frame used (e.g., current, 12-month, or lifetime) because of recall bias and the likelihood that longer time frames will yield larger numbers of mental disorders (55).

Methodology

Measuring mental disorders

Self-report: Individuals are asked to state whether or not they have a diagnosis of a mental illness.

Health Utilization Data: Diagnostic codes submitted by health care providers to insurance companies are used to determine if individuals have a mental disorder.

Screening Instruments: Interview questions measure symptom duration and severity. These instruments are often used for screening purposes to identify potential cases of mental disorders or are included in population-based surveys.

Clinical Interviews: Interviews based on standard diagnostic criteria designed to be administered by clinicians or lay interviewers in large epidemiological surveys.

In addition to the issue of case definition for mental disorders, different study designs are used to evaluate and examine the epidemiology, health services correlates and treatments for comorbid mental disorders, including epidemiological surveys, analysis of claims-based data, clinical trials, and systematic reviews and meta-analyses (see Table 1). Each type of study provides useful information, but needs to be evaluated in terms of its potential strengths and weaknesses.

Table 1: Types of studies used to examine treatment for mental disorders

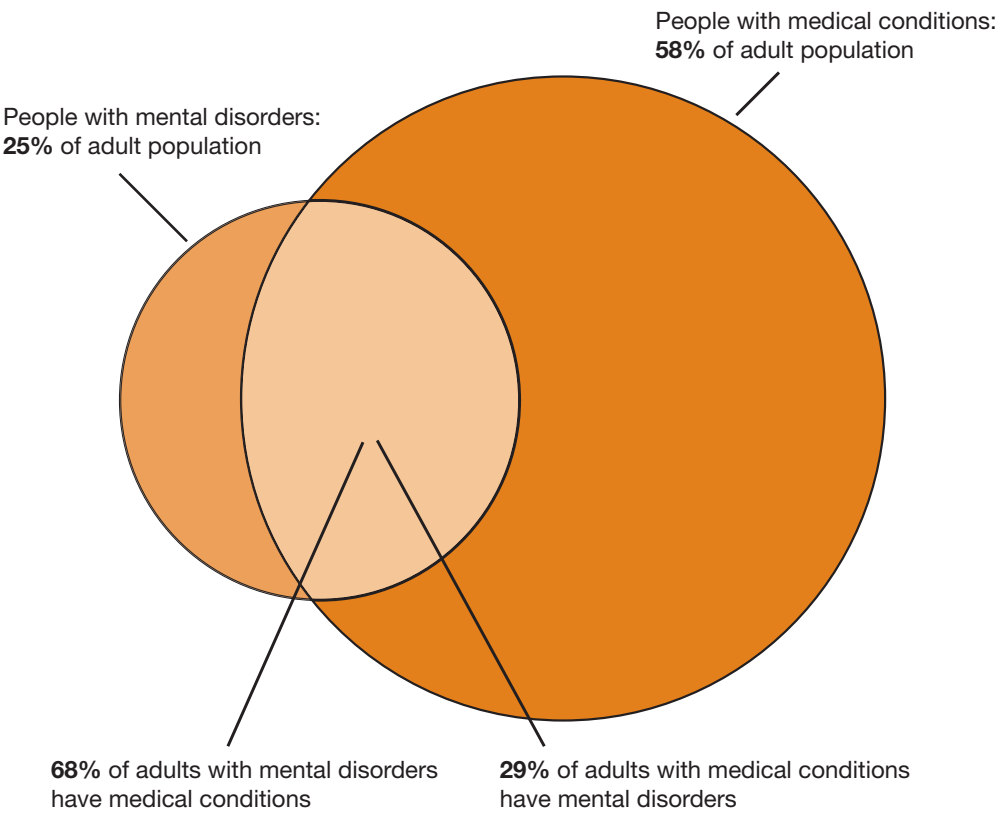
Type of Study	Example	Description	Measurement Strategies	Strengths	Weaknesses
Epidemiological	National Comorbidity Survey (NCS) (87)	Large sample surveys used to determine prevalence and correlates of mental disorders in the overall population.	• Structured lay interviews • Self-report	• Capture people with and without a diagnosis • Typically use a representative sample	• Expensive to conduct • Difficult to get timely data • Provide less information on cost and services
Claims-based	Faces of Medicaid (96)	Analysis of databases that include diagnostic codes and other health information.	• Health utilization data	• Timely data • Good for assessing cost	• Only capture people treated for a diagnosis
Clinical Trials	IMPACT study (144)	Randomized controlled trials test the efficacy of a treatment or intervention.	• Symptom-based outcome measures • Clinical interviews	• Rigorous methods for determining program effectiveness	• Examine a specific population and setting
Systematic Review and Meta-analysis	Collaborative care for depression: A cumulative meta-analysis and review of longer-term outcomes (56)	Literature is comprehensively searched for primary studies that fit eligibility criteria. Results are synthesized and, for meta-analyses, quantified.	• Variety of methods depending on articles identified in literature search	• Synthesize results of multiple studies • Meta-analyses provide overall effect sizes	• Results may be influenced by publishing bias (studies with significant results are more likely to be published)

Findings

What is the rate of comorbidity between mental and medical conditions and why is it so common?

Comorbidity between medical and mental conditions is the rule rather than the exception. In the 2001–2003 National Comorbidity Survey Replication (NCS-R), a nationally representative epidemiological survey, more than 68 percent of adults with a mental disorder (diagnosed with a structured clinical interview) reported having at least one general medical disorder, and 29 percent of those with a medical disorder had a comorbid mental health condition (Figure 1) (3, 83).

Figure 1: Percentages of people with mental disorders and/or medical conditions, 2001–2003



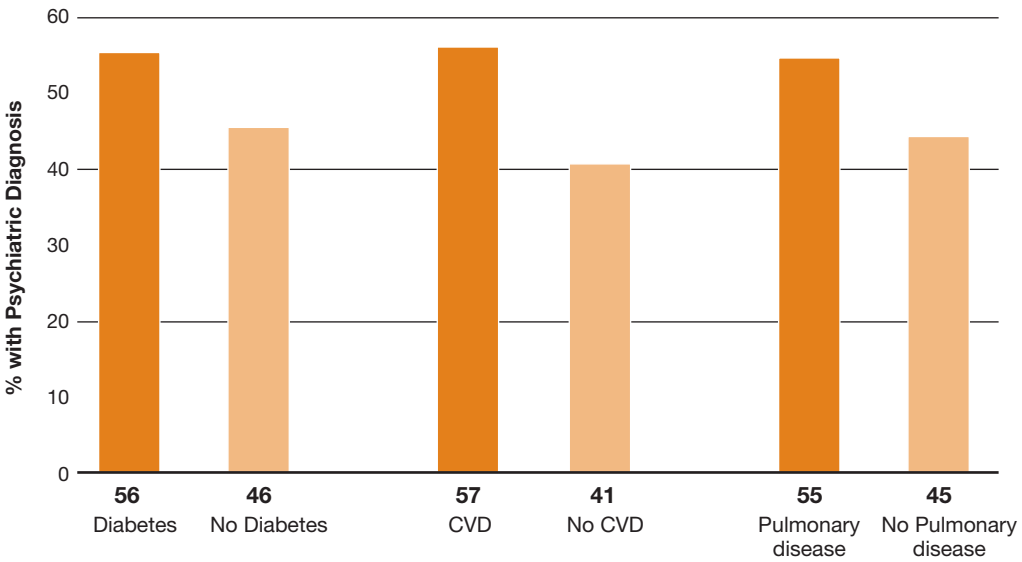
Source: Adapted from the National Comorbidity Survey Replication, 2001–2003 (3, 83)

Studies examining the association between specific medical and mental disorders in nationally representative samples have found high rates of comorbidity. For example, in the 1996 Medical Expenditure Panel Survey, the risk of self-reported depression among people reporting diabetes was two times the risk for individuals without diabetes (50). In the 2006 Behavioral Risk Factor Survey, people reporting a diagnosis of asthma were 2.3 times more likely to screen positive for current depression compared with people without asthma (141). Conversely, in the 2001–2002 National Epidemiologic Survey on Alcohol and Related Conditions, persons reporting cardiovascular disease were at 1.43 times elevated risk of having a lifetime anxiety disorder (63).

Findings

The Faces of Medicaid III report, which includes analyses of 2002 national Medicaid claims data, highlights these patterns among disabled Medicaid recipients (Figure 2) (93). In 2002, more than half of disabled Medicaid enrollees with psychiatric conditions also had claims for diabetes, cardiovascular disease (CVD) or pulmonary disease, substantially higher than rates of these illnesses among persons without psychiatric conditions. The authors conclude that the high prevalence of psychiatric diagnoses among people with chronic medical conditions should be an impetus for prioritizing the improved integration of behavioral and medical care.

Figure 2: Association of medical and psychiatric diagnoses among Medicaid-only beneficiaries with disabilities, 2002.



Source: Adapted from Faces of Medicaid III (93)

The investigators also looked at how conditions grouped into "triads" (i.e., common co-occurrences of three diseases together). Psychiatric disorders were among seven of the top ten most frequent diagnostic comorbidity triads in the most expensive 5 percent of Medicaid beneficiaries with disabilities. The most common triad was comorbid psychiatric conditions, cardiovascular disease, and central nervous system disorders, which affected 9.5 percent of all beneficiaries and 24 percent of the most expensive group of beneficiaries.

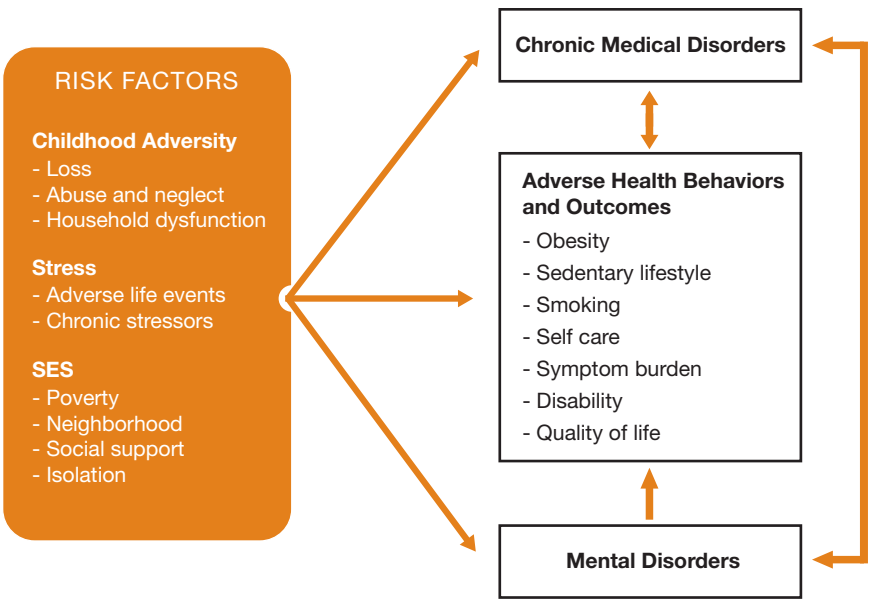
One of the most important drivers of the high numbers of individuals with comorbid mental and medical conditions is the high prevalence of mental disorders and chronic conditions in the United States. As previously noted, data from the 2001–2003 National Comorbidity Survey Replication, an epidemiological survey, found that approximately 25 percent of American adults meet criteria for at least one diagnosable mental disorder in any given year (85), and more than half report one or more chronic general medical conditions (70). In publicly insured populations, the proportion of clients receiving treatment for one or more chronic conditions is even higher; data from the 2001 Medical Expenditure Panel Survey indicate that more than 80 percent of Medicare recipients report being treated for one or more chronic illnesses (5); and national claims-based data from 2002 indicated that 79 percent of disabled and 56 percent of nondisabled adult Medicaid enrollees nationwide had one or more chronic conditions (1, 93).

Findings

In addition to the high prevalence of these conditions, there is also evidence that having each type of disorder is a risk factor for developing the other. For example, among respondents to the 1999 National Health Interview Survey, a nationally representative epidemiological survey, the likelihood of having major depression diagnosed via a screening instrument increases with each additional reported comorbid chronic medical disorder. The 12-month prevalence of major depression is about 5 percent in people without chronic medical conditions, compared with almost 8 percent in people with one condition, 10 percent in people with two conditions, and 12 percent in people with three or more medical conditions (49). Two claims-based studies of a privately insured population found that people treated for schizophrenia or bipolar disorder were up to three times more likely to have claims for three or more chronic conditions compared with people without claims for mental disorders (17, 18).

The pathways leading to comorbidity of mental and medical disorders are complex and bidirectional (80). Medical disorders may lead to mental disorders, mental conditions may place a person at risk for medical disorders, and mental and medical disorders may share common risk factors. Epidemiological studies have been important in examining these pathways. For instance, medical conditions that are accompanied by a high symptom burden, such as migraine headaches or back pain, can lead to depression (116). At the same time, major depression is a risk factor for developing medical conditions, such as cardiovascular disease, that are characterized by pain or inflammation (118). Figure 3 illustrates some of the pathways linking medical conditions and mental disorders.

Figure 3: Model of the interaction between mental disorders and medical illness



Source: Modified from Katon (80)

Findings

Exposure to early trauma and chronic stress may be a risk factor for both mental and medical disorders. Results from the Adverse Childhood Experience study (53), a survey of approximately 10,000 adults in a Health Maintenance Organization from 1995 to 1996, indicate a strong graded response between the level of exposure to childhood abuse or household dysfunction and poor health outcomes. People who experience more adverse exposures during childhood are more likely to report depression, suicide attempts and chronic medical conditions (8, 53, 72). Chronic stressors, such as lack of money for basic needs, care-giving responsibilities, conflict in relationships, or dealing with long-term medical conditions, are particularly strong predictors of depression (72).

Traumatic events throughout the lifespan, including intimate partner violence or combat exposure, can lead to post-traumatic stress disorder (PTSD). A systematic literature review estimated that combat-related PTSD afflicts between 4 percent and 17 percent of American veterans who have recently served in Iraq (125). Combat-related trauma can leave soldiers with serious and lasting injuries, which negatively affects mental health and contributes to PTSD (65, 91). In one study of 613 injured veterans, severity of PTSD and physical problems one month after injury independently predicted the severity of PTSD and depression six months later (65).

One mechanism that may underlie the relationship between stress and health conditions is that exposure to stressors is linked to a weakening of the immune system and an increase in the inflammatory response, which are risk factors for medical disorders (8, 9, 88). Mental disorders, such as depression, are linked to altered immune function including increased production of cytokines, small signaling proteins that are part of the body's inflammatory response (30, 89). The inflammatory response is critical for dealing with injury or infection, but becomes problematic when sustained over time in response to chronic stress (89). In addition, people who experience chronic stressors or negative events in childhood may also be more likely to engage in adverse health behaviors that are linked with medical conditions (53).

Socioeconomic factors, such as low income and poor educational attainment, are associated with mental disorders and medical conditions. A consistent inverse association exists between socioeconomic status (SES) and a variety of health indicators, health behaviors and mortality (66, 95, 102). For example, a meta-analysis of the literature showed that people of low socioeconomic status are 1.8 times more likely to report being depressed than people who have a higher status (102). SES may both contribute to the onset of mental disorders and be a consequence of downward "drift" resulting from a mental disorder (48). SES can also influence prevalence, morbidity and mortality of medical conditions, such as coronary heart disease and diabetes (16, 37). People of low socioeconomic status are more likely to engage in adverse health behaviors, such as eating a poor diet, smoking and not exercising, which in turn contribute to the development of chronic medical conditions (13, 94).

Low socioeconomic status reduces available resources, such as social support, and increases the chances of exposure to adverse environmental conditions (119). Individuals with low social support consistently report higher levels of depressive symptoms; this relationship can be found among the general population and among people with various chronic diseases (124, 143, 148). There is also evidence that social support may be important in the course of schizophrenia and bipolar disorder; people with low social support report poorer outcomes of these illnesses (15, 77). Low levels of social support are also negatively linked to medical conditions. For example, one review of the literature found that low social support raises the risk of developing coronary heart disease (CHD) or experiencing adverse outcomes associated with CHD by 1.5 to 2 times (101). Social support is hypothesized to directly influence mental health or indirectly affect health status by buffering the effects of stress (143).

Findings

Environmental and neighborhood conditions associated with disadvantage, such as low-quality schools and housing, limited employment prospects, and problems in access to health care services, public transportation or other resources, have a profound impact on individuals' well-being and mental health (28, 29). Neighborhood characteristics may lead to depression, for example, by increasing daily stress levels, heightening vulnerability to negative events, and disrupting social ties (29).

A 2001 systematic review concluded that neighborhood characteristics are also associated with the development of chronic medical conditions (120). For instance, people in disadvantaged communities often have limited access to healthy food options and may not be able to afford healthier choices, which contributes to high rates of obesity and diabetes (37). In a random sample of adults from a Canadian city, neighborhood deprivation was significantly associated with disability from diabetes, even when individual characteristics were taken into account (129).

Four modifiable health risk behaviors—tobacco use, excessive alcohol and illicit drug consumption, lack of physical activity, and poor nutrition—are responsible for much of the high rates of comorbidity, burden of illness, and early death related to chronic diseases (19). Persons with mental disorders are at elevated risk for each of these types of behaviors, which raises their risk of developing chronic illnesses and having poor medical outcomes once the illnesses emerge.

Using data from the 1991–1992 National Comorbidity Survey, Lasser and colleagues estimated that people with a diagnosis of a mental disorder in the past month smoke approximately 44 percent of all cigarettes in the United States and are two to three times as likely to smoke compared with those without a mental disorder (96, 58). More severe symptoms are associated with a greater likelihood of smoking; data from the 2005–2008 National Health and Nutrition Examination Survey (NHANES) found that as depression symptoms become more severe, likelihood of smoking increased (122).

A number of factors may contribute to co-occurrence of smoking and mental illness. Some have argued that smoking relieves psychiatric symptoms among some people with severe mental illness; however this "self-medication" hypothesis has not been consistently supported in the research literature (25). Other factors that may contribute to smoking rates among people with mental disorders include low socioeconomic status, social networks that include smokers, or environmental facilitators, such as residential or treatment facilities that allow smoking (25, 38, 67, 102, 111). Having a mental disorder may also make it more challenging for smokers to quit.

The factors contributing to high rates of smoking among people with mental disorders can also contribute to drug and alcohol use. Using employer-based claims data from 1996 to 2001, Carney and colleagues found that compared with people without severe mental illness, people treated for schizophrenia and bipolar disorder are 12 and 20 times more likely to be treated for alcohol abuse, and 35 and 42 times more likely to be dependent on illegal drugs, respectively (17, 18). According to a national epidemiological survey, substance use disorders are comorbid in roughly 20 percent of people with depression and 15 percent of people with anxiety (64). A review of the literature on substance abuse and PTSD found 21 percent to 43 percent of civilians with PTSD and up to 75 percent of veterans with PTSD also had a substance abuse disorder (75). Individuals may use alcohol and drugs to ameliorate negative psychiatric symptoms, to achieve a desired emotional state or to cope with stressors (26, 131).

Findings

Persons with mental conditions are more likely to have sedentary lifestyles and poor diets. The high rates of obesity among individuals with mental disorders may be attributable to poor diet and sedentary lifestyle (22, 62, 136). People with severe mental illness, including schizophrenia, bipolar disorder, or major depression, report less physical activity compared with those without mental disorders, and tend to eat foods that are high in fat and calories while avoiding fruits and vegetables (25, 31).

Many of the most common treatments for diseases may actually worsen the comorbid mental or medical problems. Most psychotropic medications, particularly antipsychotic medications, can cause weight gain, obesity and type 2 diabetes (109). At the same time, many treatments for common medical conditions may have psychological side effects that may exacerbate or complicate underlying psychiatric conditions. For example, corticosteroids are associated with mania and psychosis (92). According to two systematic literature reviews, some medications appear to contribute to mild or atypical depressive symptoms, though conflicting results about the association with depression have been found for commonly used medications such as anti-hypertensives and lipid-lowering agents (92, 117).

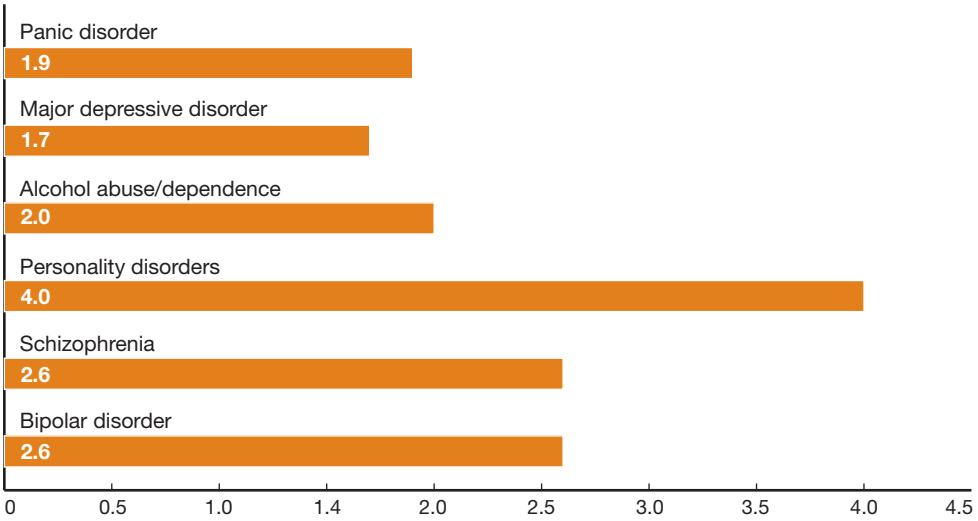
Many chronic medical conditions require patients to maintain a self-care regimen in order to manage symptoms and prevent further disease progression, which may be hampered by comorbid mental conditions. Self-care behaviors include taking medication as prescribed and adhering to lifestyle modifications, which may include exercise, diet and stress relief (103). Depression may decrease the motivation and energy needed to perform self-management behaviors and may also adversely impact interpersonal relationships, including collaboration with physicians (80). A meta-analysis indicated that the odds of noncompliance with medical treatment regimens are three times greater for depressed patients compared with nondepressed patients (34). An analysis of the claims-based 2001 Veterans Affairs National Psychosis Registry found that people with severe mental illness often exhibit poor adherence to both psychiatric medications and medications for medical conditions (121). Inadequate self-care can result in an exacerbation of medical symptoms and a decrease in health-related quality of life.

What are the associated mortality, quality of care, and cost burdens of comorbidity?

When mental and medical conditions co-occur, the combination is associated with elevated symptom burden, functional impairment, decreased length and quality of life, and increased costs (32, 49, 80, 139). The impact of having comorbid conditions is at least additive and at times may be synergistic, with the cumulative burden greater than the sum of the individual conditions.

Mental disorders are associated with a twofold to fourfold elevated risk of premature mortality (24, 47, 54). From a population perspective, the bulk of these deaths are due to "natural" causes such as cardiovascular disease rather than accidents and suicides (24). As lifespan in the general population has improved, persons with mental disorders have lagged behind, resulting in a widening disparity between persons with and without these disorders (127). In a multistate study of mortality data from 1997 to 2000 submitted by public mental health agencies, public mental health clients were found to die 25 years earlier than the average life expectancy for the general population (24). Based on a review of the literature, Eaton et al. calculated the relative risk of premature mortality in people with mental disorders compared with the general population (Figure 4).

Figure 4. Relative risk of all-cause premature mortality associated with mental disorders compared with the general population



Source: Eaton et al., 2008 (47)

Excess mortality in persons with mental disorders likely represents a common final pathway of socioeconomic disadvantage, poor quality of care, problems in treatment adherence, and adverse health behaviors. However, much of this excess mortality, like the excess mortality in general populations, is due to preventable risk factors and treatable conditions. Improved access to preventive services, diet and exercise programs, and high quality of primary care could play a role in narrowing the mortality gap for persons with mental illnesses (114).

There are problems in quality of care for treatment of comorbid conditions both in primary care and specialty mental health settings. People with mental and substance use disorders are less likely than individuals in the general population to receive preventive services such as immunizations, cancer screenings, and smoking cessation counseling, and receive worse quality of care across a range of services (42, 108). In primary care, common mental comorbidities, such as depression, often go undetected and undiagnosed (27, 68, 154). Many common mental disorders, including depression and anxiety, present with somatic symptoms such as headaches, fatigue, pain or gastrointestinal problems that overlap with those of general medical disorders, making diagnosis of these conditions challenging (61, 132). Few health care sites offer systematic screening for detection of these conditions. Similarly, veterans with PTSD experience higher rates of physical symptoms compared with veterans without PTSD, though more research on the association between PTSD and specific medical conditions is needed (6, 51, 123). Among injured veterans, the emphasis of care may focus on physical rehabilitation and emotional distress may be overlooked, especially since PTSD and depression symptoms among soldiers often emerge over time (65, 91).

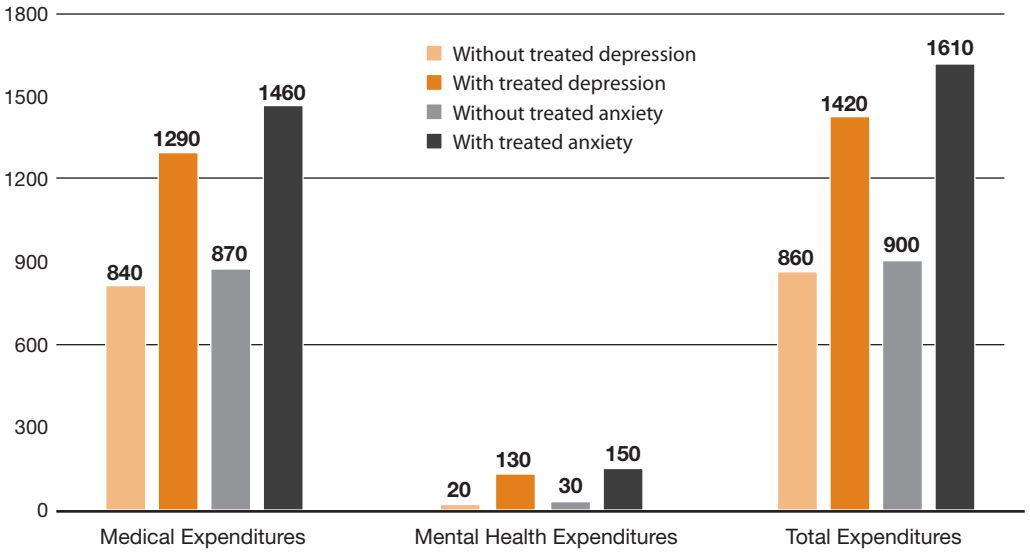
Once diagnosed, providers face time constraints in managing multiple conditions. Competing demands may prevent providers from being able to address psychosocial issues during brief office visits, which likely is a factor underlying poor quality of care for those conditions in primary care settings (23, 90, 158). Similar problems have been found in specialty mental health settings, such as the Veterans Affairs system, where having comorbid medical conditions predicts worse quality of care for more serious mental disorders (21).

Findings

There are analogous problems of underrecognition and undertreatment of medical problems for persons with mental conditions. For patients, symptoms of mental illness such as lack of motivation, fearfulness and distrust may reduce their ability to initiate and follow through with medical treatment. Among providers, primary care physicians may feel uncomfortable treating persons with serious mental illness. Psychiatrists and other mental health care providers may lack the knowledge or expertise to provide medical care for their patients. At a system level, fragmentation and separation between the medical and mental health care systems result in individuals with comorbid conditions receiving care from multiple uncoordinated locations (45).

Comorbid mental and medical conditions are associated with substantial individual and societal costs (39, 87). Melek and Norris analyzed the expenditures for comorbid medical conditions and mental disorders using the 2005 Medstat MarketScan national claims database (107). They looked at the medical expenditures, mental health expenditures, and total expenditures of individuals with one of ten common chronic conditions with and without comorbid depression or anxiety (Figure 5). They found that the presence of comorbid depression or anxiety significantly increased medical and mental health care expenditures, with over 80 percent of the increase occurring in medical expenditures. For example, the average total monthly expenditure for a person with a chronic disease and depression is $560 dollars more than for a person without depression; the discrepancy for people with and without comorbid anxiety is $710.

Figure 5. Comparison of monthly health care expenditures for chronic conditions and comorbid depression or anxiety, 2005



Source: Melek and Norris (107)

Other studies have found similar results across a range of medical and mental health comorbidities. For patients in a staff model HMO, a claims analysis found that general medical costs were 40 percent higher for people treated with bipolar disorder than without it (135). Another claims-based study, which surveyed over 4,000 adult health plan members with diabetes, found that costs attributable to mental health services accounted for less than 15 percent of the increase in total costs for people with comorbid diabetes and depression (134).

Mental disorders also present a high cost to employers. Because mental disorders affect higher order functioning, mental comorbidity may result in disproportionate costs for both absenteeism and presenteeism (59, 60). Depressive disorders contribute to significantly more sick days annually than any other condition. In an analysis of health claims and disability data from employees of a large corporation, persons with comorbid mental and medical conditions cost employers approximately twice as much as those with either condition alone (43).

What are the current evidence-based approaches for addressing comorbidity?

A literature dating back more than two decades has provided a clear indication of what does and does not work in care management on the primary care/mental health interface. Early studies that sought to improve quality of care of common mental disorders in primary care through screening and provider education did not find these methods to be effective (57). "Collaborative care" approaches that use a multidisciplinary team to screen and track mental conditions in primary care settings have been the most effective in treating these conditions (16, 56, 142). These models build on the Chronic Care Model, which describes the environmental, structural and community characteristics needed for multidisciplinary teams to work with patients in improving illness management (152). Table 2 shows the key elements of the Chronic Care Model.

Table 2. Elements of the Chronic Care Model

Elements	Description
Self-management support	• Patient and provider contributions to treatment plan • Self-management education, training, support services • Goal setting
Decision support	• Guidelines for specialist referral • Flowchart of guidelines
Delivery system design	• Composition of practice team • Clear roles and allocated tasks • Management of patient contacts—e.g., appointments, follow-up
Clinical information systems	• Patient and disease registries • Electronic records • Reminder systems and feedback to physicians
Health care organization	• Support by organization leaders • Prioritization of chronic care • Reimbursement policies
Community resources	• Collaboration with community groups – e.g., peer support

Source: Adapted from Bodenheimer et al. (10), Wagner et al., 2001 (151), and Wagner et al., 1996 (152)

Findings

More than 30 randomized controlled trials have found that collaborative care interventions improve quality and outcomes of major depression as well as anxiety disorders (16, 56, 157). In the IMPACT study, the largest collaborative care program for late-life depression, the patient, care manager, and primary care physician work together to develop a treatment plan that includes antidepressant medication or brief psychotherapy (144). Treatment plans are adjusted as needed in weekly meetings with the psychiatrist. This study is now in a dissemination phase, helping health plans and state authorities to adopt this model to populations of all ages and to presenting problems common to primary care (e.g., depression, anxiety/PTSD, bipolar disorder, substance use). Care managers follow up with patients and monitor depressive symptoms using the Patient Health Questionnaire-9 (PHQ-9), a brief screening and symptom severity measure. Similarly, positive results have been found using these collaborative approaches for improving the delivery of primary medical care in specialty settings (40, 44, 128, 153, 156).

Two key "active ingredients" of these models, identified through a literature review and meta-analysis, are the use of care managers and the use of "stepped care" approaches to illness management (11). Care managers provide patient education, aide patients with treatment decision-making, monitor symptoms, provide follow-up care, and communicate with the team (11, 14, 20, 33, 56, 142, 144). Stepped care involves tracking and monitoring medical and mental outcomes, and adjusting services or moving to a higher level of intensity as needed (104).

Collaborative care approaches have been found to be highly cost-effective from a societal perspective (82, 130). Cost-effectiveness indicates a good value for society, but does not necessarily mean that cost-effective programs will save money or result in a "cost-offset" (150). However, more recent clinical trials have suggested that cost savings may be achievable over the long term, particularly among the costliest and most complex patients, such as those with comorbid diabetes and depression (81, 145).

There are challenges, however, in moving from cost-effectiveness findings to implementation and policy, given externalities in the financing of health care in the United States. For instance, if a program reduces emergency room visits or hospitalizations, the site funding such a program is not typically able to share in these savings (105). Cost-effectiveness analyses need to be supplemented with budget impact analyses that seek to understand these costs from the perspective of the organizations who implement these programs (99, 105, 112).

There is increasing interest in developing models that use a single care manager to treat a range of medical and mental health problems (79). This parallels trends seen in general medicine which are seeking to use single care managers to address multiple conditions in patients with multimorbidities (12). These programs may ultimately be more flexible for sites to implement than the single-condition disease management programs that have historically dominated both the literature and much of the disease-management industry (10). Given high levels of comorbidity in Medicaid clients, these models may be particularly promising to disseminate for patients treated in that insurance system.

These clinical approaches to improving quality can be supported through a variety of organizational/structural relationships that can be categorized into three broad approaches: fully integrated care provided by a single organization; a partnership model in which care is shared across two different organizations; and a facilitated referral approach in which a site helps clients coordinate care occurring at multiple different clinics or sites. In contrast to the robust evidence base for clinical collaborative care models, there is little research evidence comparing the effectiveness of different organizational approaches to supporting care coordination. However, each might be expected to pose differential benefits in terms of delivering collaborative care.

Findings

In fully integrated medical, mental health, and substance use (MH/SU) health models, staff within a single organization provide primary and MH/SU health care. These models have been used primarily in large, quasi-integrated systems such as staff model HMOs and Veterans Affairs (VA), which include physical facilities that provide co-location of mental health, substance use and medical services, and an integrated electronic medical record. These systems have administrative and fiscal responsibility for both mental and medical care of a defined group of patients, providing a rationale and financial mechanism to support these relatively complex and labor-intensive models.

A partnership model is one in which primary care staff are embedded in a community MH/SU organization and/or MH/SU staff are embedded in a primary care setting. All 16 sites that have completed the National Council for Community Behavioral Healthcare's Integration Primary Care-Behavioral Health Collaborative have been partnerships between community health centers and community MH providers (98). Each site has worked on clinical (not organizational) integration, focused on either the primary care or MH setting or bi-directionally in both settings. A number of features make this an appealing approach to integration. These partnerships provide the embedded staff member with a link to the full range of expertise at their home agency via supervision, consultation and referrals. On-site clinicians can bill under the license of their home organization, overcoming some of the financial obstacles that primary care sites face in providing MH services and vice versa. These approaches may be particularly appropriate for midsized organizations such as community mental health centers and community health centers that have the infrastructure to develop partnerships but lack the resources and economies of scale to develop fully integrated practices.

A facilitated referral model is one in which primary care staff are not physically present in the MH/SU organization but the MH/SU organization conducts physical health screenings, coordinates referrals to primary care, and shares information with primary care. Alternatively, MH/SU staff is not physically present in primary care but the primary care provider conducts MH/SU screenings and coordinates referrals to MH/SU specialty settings. Typically a care manager, a key element of the collaborative approaches described previously, ensures that patients can obtain access to, and follow-up with, care outside the organization. Randomized clinical trials have shown that these models, with care managers in place ensuring follow-up and transfer of information across the organizations, can improve quality and outcomes of depression in primary care and also primary medical care among patients with serious mental illnesses (44, 137). Given the low cost and relative flexibility of these approaches, they can be useful transitional approaches for smaller sites considering integration.

None of these organizational approaches guarantees or precludes the delivery of the evidence-based approaches outlined above. However, these elements are generally easier to support in more structured organizational models than in loosely structured referral relationships. A 2006 Institute of Medicine Report recommended that sites should "transition along a continuum of evidence-based coordination models…that best meet the needs of their patient populations, and that ensure accountability." (74)

Several projects are currently working on taking established collaborative care models to scale at a statewide level. These initiatives may provide models for organizational and financial approaches to improving care at the primary care/mental health interface. More than 90 clinics have participated in an initiative known as DIAMOND (Depression Improvement Across Minnesota, Offering a New Direction), which uses the IMPACT model of collaborative care delivery. Of 151 patients enrolled for at least six months who had been contacted,

42 percent were in remission from depression, and an additional 12 percent have seen at least a 50 percent improvement in their depressive symptoms (76). To finance this model, the DIAMOND project is applying the concept of a case rate payment for depression care. Minnesota health plans are paying a monthly per person case rate to participating clinics for a bundle of services, including a care manager and consulting psychiatrist, under a single billing code. Because the payments are being made from the health care side of the system, there is an opportunity for any cost savings to accrue to the health plans paying for the program.

In the Community Care of North Carolina (CCNC) project, Medicaid enrollees receive health care and care management through local networks made up of physicians, hospitals, social service agencies and county health departments. Preliminary evidence suggests that these programs may help improve quality of care for chronic medical illnesses and save costs (140). The CCNC project is a primary care case management model that could serve as a prototype for accountable care organizations, providing care management, measurement and quality infrastructure needed by small practices. In the last several years four CCNC networks have worked with state and regional mental health authorities to pilot a model for integrating mental health and primary care (155).

Conclusion

At its core, the problem of comorbidity is one of a mismatch between a clinical reality in which medical conditions and mental health conditions are overlapping and interrelated, and a health care system in which the providers, clinics and treatments are separated. Evidence-based treatment models for improving quality in this population are often not implemented because of barriers erected by the fragmented system. New organizational and financial models, however, are being developed to help facilitate the delivery of these services.

Policy Implications

The Patient Protection and Affordable Care Act, signed into law in March 2010, will be a major focus for health and mental health policy-makers in the coming years. Given the elevated burden and poor quality of care faced by persons with comorbid mental and medical conditions, this population merits particular attention as this new legislation is implemented. A number of features of health reform, including expanded insurance, support of information technology, new organizational and financial models of care, workforce expansion, and resources for prevention hold the opportunity to better disseminate the use of evidence-based approaches to treating comorbid conditions in routine care settings.

Expanding insurance. Given high rates of uninsurance and underinsurance among persons with mental disorders, expansion of insurance under health reform has the potential to benefit persons with comorbid conditions (41). In the context of the recent passage of mental health parity legislation, this expanded insurance will include coverage for mental health services that is on a par with services for other medical conditions.

The Medicaid system is already the most important insurer for persons with serious mental illnesses, and its importance will grow under health reform. Donahue and colleagues estimate that the proportion of persons with serious mental illness (defined as depression or severe distress) treated under Medicaid is likely to nearly double (from 12.8 percent to 24.5 percent) under this expansion (35). Given that the health status of new Medicaid enrollees is expected to be similar to current beneficiaries, the cost per person will probably not change much, but overall costs to the Medicaid system from these enrollees will increase (71).

Many services needed by individuals with mental disorders, particularly those with more serious and persistent conditions, do not have a direct equivalent on the physical health side, meaning that some individuals insured under these new insurance expansions may still face gaps in services. Defining an essential mental health benefits package that includes these services could help ensure that expansion of health coverage under health reform translates into improved access to services.

Supporting improved communication. Lack of communication between the mental health and medical systems has been an important factor underlying poor quality of care for persons with comorbid conditions (74). Health Information Exchanges (HIEs) are now being formed to develop electronic networks containing data elements essential to care coordination that can be accessed by diverse participating health care organizations in a defined geographic region. Strategies will need to be developed to allow MH/SU systems to be included in these exchanges, while preserving appropriate privacy of sensitive data. The Substance Abuse and Mental Health Services Administration recently issued a report concluding that laws protecting confidentiality of drug and alcohol abuse information permit inclusion of patients with substance use disorders in these networks so long as they provide appropriate consent (100).

Including mental health in medical homes. The Patient Protection and Affordable Care Act includes provisions for demonstration projects for patient-centered health homes within Medicare and Medicaid. In primary care settings, these patient-centered health homes will need to have the capacity to either provide mental health care directly or coordinate with mental health providers. Accrediting agencies such as NCQA should be supported in efforts to include language about care coordination between medical and mental health services in their certification process. For persons with serious and persistent mental conditions, these policies could also support the development of specialty care medical homes that provide primary care services through community mental health providers.

Policy Implications

Developing new financing models. The Patient Protection and Affordable Care Act has provisions for developing and testing new models such as Accountable Care Organizations (ACOs), collectives of providers that receive bonuses for meeting quality or cost savings standards. Membership in ACOs could provide the opportunity for mental health/substance use treatment providers to integrate vertically with other components of the health care system, and contribute to achieving cost and quality targets. They could provide more flexible funding structures to support functions, such as care management, that would be important for improving care for persons with comorbid conditions.

Building a trained workforce. There is currently a shortage of providers trained to deliver evidence-based services for comorbid conditions; this shortage could become even more pronounced with the expansion of the population using health services under health reform legislation. The Patient Protection and Affordable Care Act calls for the development of training programs that focus on interdisciplinary mental and behavioral health, primary care models such as medical homes and team management of chronic disease, and the integration of physical and mental health. Workforce development should focus on training and competencies for primary care physicians in provision of care for common mental health disorders, mental health clinicians in screening and treatment of common medical conditions, and training for each type of provider in developing skills for working as consultants in the other setting (104).

Prioritizing prevention. While improving care for comorbid conditions is critical, it will ultimately be essential to work upstream to prevent or delay their onset. Primary prevention efforts will be needed to address common risk factors for comorbid conditions, such as adverse health behaviors and substance use, in their social and environmental contexts. Secondary prevention should include screening for common mental disorders in primary care settings and for common medical health conditions in specialty medical settings.

The Need for Additional Information

In conducting this review, several gaps in the literature on mental health and medical comorbidity became evident. First, most of the existing literature on comorbidity examines the impact of particular comorbid conditions on an index medical or mental illness (e.g., diabetes and depression). While there is value in these specific, clinically-focused approaches to understanding comorbidity, patients with comorbid conditions share many common features that make them valuable to examine as a distinct population of interest. They are, in many ways, analogous to racial and ethnic disparities groups who are monitored separately and often require tailored quality improvement programs. Second, nearly all of the current evidence for this population focuses on clinical models rather than organizational or systems level approaches to implementing those models. Comparative effectiveness trials will be needed to compare organizational approaches to delivering and sustaining these evidence-based approaches to improving care for persons with comorbid conditions. Finally, health reform will include a broad range of changes in insurance coverage and care delivery that could have a disproportionate impact on persons with comorbid medical and mental conditions. Tracking the impact of this legislation on costs, burden and outcomes of care for this population could provide important information to inform future iterations of health legislation.

Appendix I References

1. Adelmann PK. "Mental and Substance Use Disorders among Medicaid Recipients: Prevalence Estimates from Two National Surveys." *Administration and Policy in Mental Health,* vol. 31, no. 2, 2003.

2. Alakeson V, Frank RG, Katz RE. "Specialty Care Medical Homes for People with Severe, Persistent Mental Disorders." *Health Affairs,* vol. 29, no. 5, 2010.

3. Alegria M, Jackson JS, Kessler RC, Takeuchi D. *National Comorbidity Survey Replication (NCS-R), 2001–2003.* Ann Arbor: Inter-university Consortium for Political and Social Research, 2003.

4. Anda RF, Williamson DF, Escobedo LG, Mast EE, Giovino GA, Remington PL. "Depression and the Dynamics of Smoking—A National Perspective." *Journal of the American Medical Association,* vol. 264, no. 12, 1990.

5. Anderson GF. "Medicare and Chronic Conditions." *New England Journal of Medicine,* vol. 353, no. 3, 2005.

6. Barrett DH, Doebbeling CC, Schwartz DA, Voelker MD, Falter KH, Woolson RF, Doebbeling BN. "Posttraumatic Stress Disorder and Self-Reported Physical Health Status among U.S. Military Personnel Serving During the Gulf War Period: A Population-Based Study." *Psychosomatics,* vol. 43, no. 3, 2002.

7. Bernstein E. "How New Law Boosts Coverage of Mental Care." *Wall Street Journal,* October 16, 2008.

8. Black PH. "The Inflammatory Consequences of Psychologic Stress: Relationship to Insulin Resistance, Obesity, Atherosclerosis and Diabetes Mellitus, Type II." *Medical Hypotheses,* vol. 67, no. 4, 2006.

9. Black PH, Garbutt LD. "Stress, Inflammation and Cardiovascular Disease." *Journal of Psychosomatic Research,* vol. 52, no. 1, 2002.

10. Bodenheimer T, Wagner EH, Grumbach K. "Improving Primary Care for Patients with Chronic Illness." *Journal of the American Medical Association,* vol. 288, no. 14, 2002.

11. Bower P, Gilbody S, Richards D, Fletcher J, Sutton A. "Collaborative Care for Depression in Primary Care—Making Sense of a Complex Intervention: Systematic Review and Meta-Regression." *British Journal of Psychiatry,* vol. 189, 2006.

12. Boyd CM, Reider L, Frey K, Scharfstein D, Leff B, Wolff J, Groves C, Karm L, Wegener S, Marsteller J, Boult C. "The Effects of Guided Care on the Perceived Quality of Health Care for Multi-Morbid Older Persons: 18-Month Outcomes from a Cluster-Randomized Controlled Trial." *Journal of General Internal Medicine,* vol. 25, no. 3, 2010.

13. Brezinka V, Kittel F. "Psychosocial Factors of Coronary Heart Disease in Women: A Review." *Social Science & Medicine,* vol. 42, no. 10, 1996.

14. Bruce ML, Ten Have TR, Reynolds CF, Katz II, Schulberg HC, Mulsant BH, Brown GK, McAvay GJ, Pearson JL, Alexopoulos GS. "Reducing Suicidal Ideation and Depressive Symptoms in Depressed Older Primary Care Patients: A Randomized Controlled Trial." *Journal of the American Medical Association,* vol. 291, no. 9, 2004.

15. Buchanan J. "Social Support and Schizophrenia: A Review of the Literature." *Archives of Psychiatric Nursing,* vol. 9, no. 2, 1995.

16. Butler M, Kane R, McAlpine D, Kathol RG, Fu SS, Hagedorn H, Wilt TJ. *Integration of Mental Health/ Substance Abuse and Primary Care.* Minneapolis: Minnesota Evidence-Based Practice Center, 2009.

17. Carney CP, Jones L, Woolson RF. "Medical Comorbidity in Women and Men with Schizophrenia: A Population-Based Controlled Study." *Journal of General Internal Medicine,* vol. 21, no. 11, 2006.

18. Carney CP, Jones LE. "Medical Comorbidity in Women and Men with Bipolar Disorders: A Population-Based Controlled Study." *Psychosomatic Medicine,* vol. 68, no. 5, 2006.

19. Centers for Disease Control and Prevention. Chronic Diseases and Health Promotion. 2010; *www.cdc.gov/chronicdisease/overview/*. Accessed August 9, 2010.

20. Christensen H, Griffiths KM, Gulliver A, Clack D, Kljakovic M, Wells L. "Models in the Delivery of Depression Care: A Systematic Review of Randomised and Controlled Intervention Trials." *BMC Family Practice,* | vol. 9, 2008.

21. Chwastiak L, Rosenheck R, Leslie D. "Impact of Medical Comorbidity on the Quality of Schizophrenia Pharmacotherapy in a National VA Sample." *Medical Care,* vol. 44, no. 1, 2006.

22. Chwastiak LA, Rosenheck RA, McEvoy JP, Stroup TS, Swartz MS, Davis SM, Lieberman JA. "The Impact of Obesity on Health Care Costs among Persons with Schizophrenia." *General Hospital Psychiatry,* vol. 31, no. 1, 2009.

Appendix I References

23. Collins KA, Westra HA, Dozois DJ, Burns DD. "Gaps in Accessing Treatment for Anxiety and Depression: Challenges for the Delivery of Care." *Clinical Psychology Review,* vol. 24, no. 5, 2004.

24. Colton CW, Manderscheid RW. "Congruencies in Increased Mortality Rates, Years of Potential Life Lost, and Causes of Death among Public Mental Health Clients in Eight States." *Preventing Chronic Disease,* vol. 3, no. 2, 2006.

25. Compton MT, Daumit GL, Druss BG. "Cigarette Smoking and Overweight/Obesity among Individuals with Serious Mental Illnesses: A Preventive Perspective." *Harvard Review of Psychiatry,* vol. 14, no. 4, 2006.

26. Cooper ML, Frone MR, Russell M, Mudar P. "Drinking to Regulate Positive and Negative Emotions—A Motivational Model of Alcohol Use." *Journal of Personality and Social Psychology,* vol. 69, no. 5, 1995.

27. Coulehan JL, Schulberg HC, Block MR, Janosky JE, Arena VC. "Medical Comorbidity of Major Depressive Disorder in a Primary Medical Practice." *Archives of Internal Medicine,* vol. 150, no. 11, 1990.

28. Cutrona CE, Russell DW, Brown PA, Clark LA, Hessling RM, Gardner KA. "Neighborhood Context, Personality, and Stressful Life Events as Predictors of Depression among African American Women." *Journal of Abnormal Psychology,* vol. 114, no. 1, 2005.

29. Cutrona CE, Wallace G, Wesner KA. "Neighborhood Characteristics and Depression—An Examination of Stress Processes." *Current Directions in Psychological Science,* vol. 15, no. 4, 2006.

30. Dantzer R, Wollman E, Vitkovic L, Yirmiya R. "Cytokines and Depression: Fortuitous or Causative Association?" *Molecular Psychiatry,* vol. 4, no. 4, 1999.

31. Daumit GL, Goldberg RW, Anthony C, Dickerson F, Brown CH, Kreyenbuhl J, Wohlheiter K, Dixon LB. "Physical Activity Patterns in Adults with Severe Mental Illness." *Journal of Nervous and Mental Disease,* vol. 193, no. 10, 2005.

32. Dickerson F, Brown CH, Fang L, Goldberg RW, Kreyenbuhl J, Wohlheiter K, Dixon L. "Quality of Life in Individuals with Serious Mental Illness and Type 2 Diabetes." *Psychosomatics,* vol. 49, no. 2, 2008.

33. Dietrich AJ, Oxman TE, Burns MR, Winchell CW, Chin T. "Application of a Depression Management Office System in Community Practice: A Demonstration." *Journal of the American Board of Family Practitioners,* vol. 16, no. 2, 2003.

34. DiMatteo MR, Lepper HS, Croghan TW. "Depression Is a Risk Factor for Noncompliance with Medical Treatment: Meta-Analysis of the Effects of Anxiety and Depression on Patient Adherence." *Archives of Internal Medicine,* vol. 160, no. 14, 2000.

35. Donohue J, Garfield R, Lave J. "The Impact of Expanded Health Insurance Coverage on Individuals with Mental Illnesses and Substance Use Disorders." Washington: Presented to the Assistant Secretary for Planning and Evaluation; 2010.

36. Donohue J, Garfield R, Lave J. "Health Reform and the Scope of Benefits for Mental Heatlh and Substance Use Disorder Services." *Psychiatric Services,* vol. 61, no. 11, 2010.

37. Drewnowski A. "Obesity, Diets, and Social Inequalities." *Nutrition Reviews,* vol. 67, no. 5, 2009.

38. Druss BG, Bornemann TH. "Improving Health and Health Care for Persons with Serious Mental Illness: The Window for US Federal Policy Change." *Journal of the American Medical Association,* vol. 303, no. 19, 2010.

39. Druss BG, Marcus SC, Olfson M, Pincus HA. "The Most Expensive Medical Conditions in America." *Health Affairs (Millwood),* vol. 21, no. 4, 2002.

40. Druss BG, Rohrbaugh RM, Levinson CM, Rosenheck RA. "Integrated Medical Care for Patients with Serious Psychiatric Illness: A Randomized Trial." *Archives of General Psychiatry,* vol. 58, no. 9, 2001.

41. Druss BG, Rosenheck RA. "Mental Disorders and Access to Medical Care in the United States." *American Journal of Psychiatry,* vol. 155, no. 12, 1998.

42. Druss BG, Rosenheck RA, Desai MM, Perlin JB. "Quality of Preventive Medical Care for Patients with Mental Disorders." *Medical Care,* vol. 40, no. 2, 2002.

43. Druss BG, Rosenheck RA, Sledge WH. "Health and Disability Costs of Depressive Illness in a Major U.S. Corporation." *American Journal of Psychiatry,* vol. 157, no. 8, 2000.

Appendix I References

44. Druss BG, Von Esenwein SA. "Improving Primary Medical Care for Persons with Mental and Addictive Disorders: Systematic Review." *General Hospital Psychiatry,* vol. 28, no. 2, 2001.

45. Druss BG, von Esenwein SA. "Improving General Medical Care for Persons with Mental and Addictive Disorders: Systematic Review." *General Hospital Psychiatry,* vol. 28, no. 2, 2006.

46. Druss BG, von Esenwein SA, Compton MT, Rask KJ, Zhao LP, Parker RM. "A Randomized Trial of Medical Care Management for Community Mental Health Settings: The Primary Care Access, Referral, and Evaluation (PCARE) Study." *American Journal of Psychiatry,* vol. 167, no. 2, 2010.

47. Eaton WW, Martins SS, Nestadt G, Bienvenu OJ, Clarke D, Alexandre P. "The Burden of Mental Disorders." *Epidemiologic Reviews,* vol. 30, no. 1, 2008.

48. Eaton WW, Muntaner C. "Socioeconomic Stratification and Mental Disorder." In *A Handbook for the Study of Mental Health: Social Contexts, Theories, and Systems*, Horowitz AV and Scheid TL (eds). Cambridge: Cambridge University Press, 1999. pp. 259–283.

49. Egede LE. "Major Depression in Individuals with Chronic Medical Disorders: Prevalence, Correlates and Association with Health Resource Utilization, Lost Productivity and Functional Disability." *General Hospital Psychiatry,* vol. 29, no. 5, 2007.

50. Egede LE, Zheng D, Simpson K. "Comorbid Depression Is Associated with Increased Health Care Use and Expenditures in Individuals with Diabetes." *Diabetes Care,* vol. 25, no. 3, 2002.

51. Engel CC, Jr., Liu X, McCarthy BD, Miller RF, Ursano R. "Relationship of Physical Symptoms to Posttraumatic Stress Disorder among Veterans Seeking Care for Gulf War-Related Health Concerns." *Psychosomatic Medicine,* vol. 62, no. 6, 2000.

52. Feinstein A. "Pre-Therapeutic Classification of Co-Morbidity in Chronic Disease." *Journal of Chronic Diseases,* vol. 23, no. 7, 1970.

53. Felitti VJ, Anda RF, Nordenberg D, Williamson DF, Spitz AM, Edwards V, Koss MP, Marks JS. "Relationship of Childhood Abuse and Household Dysfunction to Many of the Leading Causes of Death in Adults: The Adverse Childhood Experiences (ACE) Study." *American Journal of Preventive Medicine,* vol. 14, no. 4, 1998.

54. Felker B, Yazel JJ, Short D. "Mortality and Medical Comorbidity among Psychiatric Patients: A Review." *Psychiatric Services,* vol. 47, no. 12, 1996.

55. Freeman EJ, Colpe LJ, Strine TW, Dhingra S, McGuire LC, Elam-Evans LD, Perry GS. "Public Health Surveillance for Mental Health." *Preventing Chronic Disease,* vol. 7, no. 1, 2010.

56. Gilbody S, Bower P, Fletcher J, Richards D, Sutton AJ. "Collaborative Care for Depression: A Cumulative Meta-Analysis and Review of Longer-Term Outcomes." *Archives of Internal Medicine,* vol. 166, no. 21, 2006.

57. Gilbody SM, House AO, Sheldon TA. "Routinely Administered Questionnaires for Depression and Anxiety: Systematic Review." *British Medical Journal,* vol. 322, no. 7283, 2001.

58. Glassman AH, Helzer JE, Covey LS, Cottler LB, Stetner F, Tipp JE, Johnson J. "Smoking, Smoking Cessation, and Major Depression." *Journal of the American Medical Association,* vol. 264, no. 12, 1990.

59. Goetzel RZ, Hawkins K, Ozminkowski RJ, Wang S. "The Health and Productivity Cost Burden of the 'Top 10' Physical and Mental Health Conditions Affecting Six Large U.S. Employers in 1999." *Journal of Occupational and Environmental Medicine,* vol. 45, no. 1, 2003.

60. Goetzel RZ, Long SR, Ozminkowski RJ, Hawkins K, Wang S, Lynch W. "Health, Absence, Disability, and Presenteeism Cost Estimates of Certain Physical and Mental Health Conditions Affecting U.S. Employers." *Journal of Occupational and Environmental Medicine,* vol. 46, no. 4, 2004.

61. Goldman LS, Nielsen NH, Champion HC. "Awareness, Diagnosis, and Treatment of Depression." *Journal of General Internal Medicine,* vol. 14, no. 9, 1999.

62. Goodwin RD. "Association between Physical Activity and Mental Disorders among Adults in the United States." *Preventive Medicine,* vol. 36, no. 6, 2003.

63. Goodwin RD, Davidson KW, Keyes K. "Mental Disorders and Cardiovascular Disease among Adults in the United States." *Journal of Psychiatric Research,* vol. 43, no. 3, 2008.

Appendix I References

64. Grant BF, Stinson FS, Dawson DA, Chou SP, Dufour MC, Compton W, Pickering RP, Kaplan K. "Prevalence and Co-Occurrence of Substance Use Disorders and Independent Mood and Anxiety Disorders—Results from the National Epidemiologic Survey on Alcohol and Related Conditions." *Archives of General Psychiatry,* vol. 61, no. 8, 2004.

65. Grieger TA, Cozza SJ, Ursano RJ, Hoge C, Martinez PE, Engel CC, Wain HJ. "Posttraumatic Stress Disorder and Depression in Battle-Injured Soldiers." *American Journal of Psychiatry,* vol. 163, no. 10, 2006.

66. Harper S, Lynch J. "Trends in Socioeconomic Inequalities in Adult Health Behaviors among U.S. States, 1990–2004." *Public Health Reports,* vol. 122, no. 2, 2007.

67. Harwood GA, Salsberry P, Ferketich AK, Wewers AE. "Cigarette Smoking, Socioeconomic Status, and Psychosocial Factors: Examining a Conceptual Framework." *Public Health Nursing,* vol. 24, no. 4, 2007.

68. Higgins ES. "A Review of Unrecognized Mental Illness in Primary Care. Prevalence, Natural History, and Efforts to Change the Course." *Archives of Family Medicine,* vol. 3, no. 10, 1994.

69. Higgins JPT and Green S (eds). *Cochrane Handbook for Systematic Reviews of Interventions*. The Cochrane Collaboration, 2009.

70. Hoffman C, Rice D, Sung HY. "Persons with Chronic Conditions. Their Prevalence and Costs." *Journal of the American Medical Association,* vol. 276, no. 18, 1996.

71. Holahan J, Kenney G, Pelletier J. *The Health Status of New Medicaid Enrollees under Health Reform*. Robert Wood Johnson Foundation and Urban Institute, 2010.

72. Honkalampi K, Hintikka J, Haatainen K, Koivumaa-Honkanen H, Tanskanen A, Viinamaki H. "Adverse Childhood Experiences, Stressful Life Events or Demographic Factors: Which Are Important in Women's Depression? A 2-Year Follow-up Population Study." *Australian and New Zealand Journal of Psychiatry,* vol. 39, no. 7, 2005.

73. Hopewell S, McDonald S, Clarke M, Egger M. "Grey Literature in Meta-Analyses of Randomized Trials of Health Care Interventions." *Cochrane Database of Systematic Reviews,* 2007.

74. Institute of Medicine (U.S.). Committee on Crossing the Quality Chasm. *Adaptation to Mental Health and Addictive Disorders. Improving the Quality of Health Care for Mental and Substance-Use Conditions.* Washington: 2006.

75. Jacobsen LK, Southwick SM, Kosten TR. "Substance Use Disorders in Patients with Posttraumatic Stress Disorder: A Review of the Literature." *American Journal of Psychiatry,* vol. 158, no. 8, 2001.

76. Jaeckels N. "Early DIAMOND Adopters Offer Insights." *Minnesota Physician,* April 2009.

77. Johnson L, Lundstrom O, Aberg-Wistedt A, Mathe AA. "Social Support in Bipolar Disorder: Its Relevance to Remission and Relapse." *Bipolar Disorders,* vol. 5, no. 2, 2003.

78. Kaiser Family Foundation. *Focus on Health Reform: Summary of New Health Reform Law*. The Henry J. Kaiser Family Foundation, 2010.

79. Katon W, Lin EH, Von Korff M, Ciechanowski P, Ludman E, Young B, Rutter C, Oliver M, McGregor M. "Integrating Depression and Chronic Disease Care among Patients with Diabetes and/or Coronary Heart Disease: The Design of the TEAMcare Study." *Contemporary Clinical Trials,* vol. 31, no. 4, 2010.

80. Katon WJ. "Clinical and Health Services Relationships between Major Depression, Depressive Symptoms, and General Medical Illness." *Biological Psychiatry,* vol. 54, no. 3, 2003.

81. Katon WJ, Russo JE, Von Korff M, Lin EH, Ludman E, Ciechanowski PS. "Long-Term Effects on Medical Costs of Improving Depression Outcomes in Patients with Depression and Diabetes." *Diabetes Care,* vol. 31, no. 6, 2008.

82. Katon WJ, Schoenbaum M, Fan MY, Callahan CM, Williams J, Jr., Hunkeler E, Harpole L, Zhou XH, Langston C, Unutzer J. "Cost-Effectiveness of Improving Primary Care Treatment of Late-Life Depression." *Archives of General Psychiatry,* vol. 62, no. 12, 2005.

83. Kessler RC, Berglund P, Chiu WT, Demler O, Heeringa S, Hiripi E, Jin R, Pennell BE, Walters EE, Zaslavsky A, Zheng H. "The US National Comorbidity Survey Replication (NCS-R): Design and Field Procedures." *International Journal of Methods in Psychiatric Research,* vol. 13, no. 2, 2004.

Appendix I References

84. Kessler RC, Berglund P, Demler O, Jin R, Merikangas KR, Walters EE. "Lifetime Prevalence and Age-of-Onset Distributions of DSM-IV Disorders in the National Comorbidity Survey Replication." *Archives of General Psychiatry,* vol. 62, no. 6, 2005.

85. Kessler RC, Chiu WT, Demler O, Walters EE. "Prevalence, Severity, and Comorbidity of 12-Month DSM-IV Disorders in the National Comorbidity Survey Replication." *Archives of General Psychiatry,* vol. 62, no. 6, 2005.

86. Kessler RC, Demler O, Frank RG, Olfson M, Pincus HA, Walters EE, Wang P, Wells KB, Zaslavsky AM. "Prevalence and Treatment of Mental Disorders, 1990 to 2003." *New England Journal of Medicine,* vol. 352, no. 24, 2005.

87. Kessler RC, Heeringa S, Lakoma MD, Petukhova M, Rupp AE, Schoenbaum M, Wang PS, Zaslavsky AM. "Individual and Societal Effects of Mental Disorders on Earnings in the United States: Results from the National Comorbidity Survey Replication." *American Journal of Psychiatry,* vol. 165, no. 6, 2008.

88. Khansari DN, Murgo AJ, Faith RE. "Effects of Stress on the Immune System." *Immunology Today,* vol. 11, no. 5, 1990.

89. Kiecolt-Glaser JK, Glaser R. "Depression and Immune Function—Central Pathways to Morbidity and Mortality." *Journal of Psychosomatic Research,* vol. 53, no. 4, 2002.

90. Klinkman MS. "Competing Demands in Psychosocial Care. A Model for the Identification and Treatment of Depressive Disorders in Primary Care." *General Hospital Psychiatry,* vol. 19, no. 2, 1997.

91. Koren D, Norman D, Cohen A, Berman J, Klein EM. "Increased PTSD Risk with Combat-Related Injury: A Matched Comparison Study of Injured and Uninjured Soldiers Experiencing the Same Combat Events." *American Journal of Psychiatry,* vol. 162, no. 2, 2005.

92. Kotlyar M, Dysken M, Adson DE. "Update on Drug-Induced Depression in the Elderly." *American Journal of Geriatric Pharmacotherapy,* vol. 3, no. 4, 2005.

93. Kronick RG, Bella M, Gilmer TP. *The Faces of Medicaid III: Refining the Portrait of People with Multiple Chronic Conditions*. Center for Health Care Strategies, Inc., 2009.

94. Kronick RG, Bella M, Gilmer TP, Somers S. *Faces of Medicaid II: Recognizing the Care Needs of People with Multiple Chronic Conditions*. Center for Health Care Strategies, Inc., 2007.

95. Lantz PM, House JS, Lepkowski JM, Williams DR, Mero RP, Chen JM. "Socioeconomic Factors, Health Behaviors, and Mortality—Results from a Nationally Representative Prospective Study of US Adults." *Journal of the American Medical Association,* vol. 279, no. 21, 1998.

96. Lasser K, Boyd JW, Woolhandler S, Himmelstein DU, McCormick D, Bor DH. "Smoking and Mental Illness: A Population-Based Prevalence Study." *Journal of the American Medical Association,* vol. 284, no. 20, 2000.

97. Lavis J, Davies H, Oxman A, Denis JL, Golden-Biddle K, Ferlie E. "Towards Systematic Reviews That Inform Health Care Management and Policy-Making." *Journal of Health Services Research,* vol. 10, no. S1, 2005.

98. "Learning Collaboratives Enhance Population Health." *National Council Magazine,* Winter 2009.

99. Leatherman S, Berwick D, Iles D, Lewin LS, Davidoff F, Nolan T, Bisognano M. "The Business Case for Quality: Case Studies and an Analysis." *Health Affairs,* vol. 22, no. 2, 2003.

100. Legal Action Center for the Substance Abuse and Mental Health Services Administration. Frequently Asked Questions: Applying the Substance Abuse Confidentiality Regulations to Health Information Exchange (HIE). n.d.; *www.samhsa.gov/HealthPrivacy/docs/EHR-FAQs.pdf.* Accessed September 3, 2010.

101. Lett HS, Blumenthal JA, Babyak MA, Strauman TJ, Robins C, Sherwood A. "Social Support and Coronary Heart Disease: Epidemiologic Evidence and Implications for Treatment." *Psychosomatic Medicine,* vol. 67, no. 6, 2005.

102. Lorant V, Deliege D, Eaton W, Robert A, Philippot P, Ansseau M. "Socioeconomic Inequalities in Depression: A Meta-Analysis." *American Journal of Epidemiology,* vol. 157, no. 2, 2003.

103. Lorig KR, Holman H. "Self-Management Education: History, Definition, Outcomes, and Mechanisms." *Annals of Behavioral Medicine,* vol. 26, no. 1, 2003.

104. Mauer BJ, Druss BG. *Mind and Body Reunited: Improving Care at the Behavioral and Primary Healthcare Interface.* Albuquerque: American College of Mental Health Administration, 2007.

Appendix I References

105. Mauskopf JA, Sullivan SD, Annemans L, Caro J, Mullins CD, Nuijten M, Orlewska E, Watkins J, Trueman P. "Principles of Good Practice for Budget Impact Analysis: Report of the ISPOR Task Force on Good Research Practices—Budget Impact Analysis." *Value in Health,* vol. 10, no. 5, 2007.

106. McGlynn EA, Asch SM, Adams J, Keesey J, Hicks J, DeCristofaro A, Kerr EA. "The Quality of Health Care Delivered to Adults in the United States." *New England Journal of Medicine,* vol. 348, no. 26, 2003.

107. Melek S, Norris D. *Chronic Conditions and Comorbid Psychological Disorders.* Seattle: Milliman, 2008.

108. Mitchell AJ, Malone D, Doebbeling CC. "Quality of Medical Care for People with and without Comorbid Mental Illness and Substance Misuse: Systematic Review of Comparative Studies." *British Journal of Psychiatry,* vol. 194, no. 6, 2009.

109. Muench J, Hamer AM. "Adverse Effects of Antipsychotic Medications." *American Family Physician,* vol. 81, no. 5, 2010.

110. Muir-Cochrane E. "Medical Co-Morbidity Risk Factors and Barriers to Care for People with Schizophrenia." *Journal of Psychiatric and Mental Health Nursing,* vol. 13, no. 4, 2006.

111. Muntaner C, Eaton WW, Miech R, O'Campo P. "Socioeconomic Position and Major Mental Disorders." *Epidemiologic Reviews,* vol. 26, 2004.

112. Neumann PJ. "Budget Impact Analyses Get Some Respect." *Value in Health,* vol. 10, no. 5, 2007.

113. Orszag PR, Emanuel EJ. "Health Care Reform and Cost Control." *New England Journal of Medicine,* vol. 363, no. 7, 2010.

114. Parks J, Svendsen D, Singer P, Foti ME. *Morbidity and Mortality in People with Serious Mental Illness.* Alexandria: National Association of State Mental Health Program Directors, 2006.

115. *Patient-Centered Medical Home (PCMH) 2011 Draft Standards Overview.* Washington: National Committee for Quality Assurance, 2010.

116. Patten SB. "Long-Term Medical Conditions and Major Depression in a Canadian Population Study at Waves 1 and 2." *Journal of Affective Disorders,* vol. 63, no. 1–3, 2001.

117. Patten SB, Barbui C. "Drug-Induced Depression: A Systematic Review to Inform Clinical Practice." *Psychotherapy and Psychosomatics,* vol. 73, no. 4, 2004.

118. Patten SB, Williams JVA, Lavorato DH, Modgill G, Jette N, Eliasziw M. "Major Depression as a Risk Factor for Chronic Disease Incidence: Longitudinal Analyses in a General Population Cohort." *General Hospital Psychiatry,* vol. 30, no. 5, 2008.

119. Phelan JC, Link BG, Diez-Roux A, Kawachi I, Levin B. "'Fundamental Causes' of Social Inequalities in Mortality: A Test of the Theory." *Journal of Health and Social Behavior,* vol. 45, no. 3, 2004.

120. Pickett KE, Pearl M. "Multilevel Analyses of Neighbourhood Socioeconomic Context and Health Outcomes: A Critical Review." *Journal of Epidemiology and Community Health,* vol. 55, no. 2, 2001.

121. Piette JD, Heisler M, Ganoczy D, McCarthy JF, Valenstein M. "Differential Medication Adherence among Patients with Schizophrenia and Comorbid Diabetes and Hypertension." *Psychiatric Services,* vol. 58, no. 2, 2007.

122. Pratt LA, Brody DJ. "Depression and Smoking in the U.S. Household Population Aged 20 and over, 2005–2008." *NCHS Data Brief.* Vol 34. Hyattsville, MD: National Center for Health Statistics, 2010.

123. Qureshi SU, Pyne JM, Magruder KM, Schulz PE, Kunik ME. "The Link between Post-Traumatic Stress Disorder and Physical Comorbidities: A Systematic Review." *Psychiatric Quarterly,* vol. 80, no. 2, 2009.

124. Reisinger EL, Dilorio C. "Individual, Seizure-Related, and Psychosocial Predictors of Depressive Symptoms among People with Epilepsy over Six Months." *Epilepsy & Behavior,* vol. 15, no. 2, 2009.

125. Richardson LK, Frueh BC, Acierno R. "Prevalence Estimates of Combat-Related Post-Traumatic Stress Disorder: Critical Review." *Australian and New Zealand Journal of Psychiatry,* vol. 44, no. 1, 2010.

126. Rittenhouse DR, Shortell SM, Fisher ES. "Primary Care and Accountable Care—Two Essential Elements of Delivery-System Reform." *New England Journal of Medicine,* vol. 361, no. 24, 2009.

Appendix I References

127. Saha S, Chant D, McGrath J. "A Systematic Review of Mortality in Schizophrenia: Is the Differential Mortality Gap Worsening over Time?" *Archives of General Psychiatry,* vol. 64, no. 10, 2007.

128. Saxon AJ, Malte CA, Sloan KL, Baer JS, Calsyn DA, Nichol P, Chapko MK, Kivlahan DR. "Randomized Trial of Onsite Versus Referral Primary Medical Care for Veterans in Addictions Treatment." *Medical Care,* vol. 44, no. 4, 2006.

129. Schmitz N, Boyer R, Nitka D, Messier L, Gariepy G, Strychar I, Malla A, Lesage A, Wang JL. "Association between Neighborhood-Level Deprivation and Disability in a Community Sample of People with Diabetes." *Diabetes Care,* vol. 32, no. 11, 2009.

130. Schoenbaum M, Unutzer J, Sherbourne C, Duan N, Rubenstein LV, Miranda J, Meredith LS, Carney MF, Wells K. "Cost-Effectiveness of Practice-Initiated Quality Improvement for Depression: Results of a Randomized Controlled Trial." *Journal of the American Medical Association,* vol. 286, no. 11, 2001.

131. Schuckit MA, Smith TL, Chacko Y. "Evaluation of a Depression-Related Model of Alcohol Problems in 430 Probands from the San Diego Prospective Study." *Drug and Alcohol Dependence,* vol. 82, no. 3, 2006.

132. Seelig MD, Katon W. "Gaps in Depression Care: Why Primary Care Physicians Should Hone Their Depression Screening, Diagnosis, and Management Skills." *Journal of Occupational and Environmental Medicine,* vol. 50, no. 4, 2008.

133. Silver E, Mulvey EP, Swanson JW. "Neighborhood Structural Characteristics and Mental Disorder: Faris and Dunham Revisited." *Social Science & Medicine,* vol. 55, no. 8, 2002.

134. Simon GE, Katon WJ, Lin EHB, Ludman E, VonKorff M, Ciechanowski P, Young BA. "Diabetes Complications and Depression as Predictors of Health Service Costs." *General Hospital Psychiatry,* vol. 27, no. 5, 2005.

135. Simon GE, Unutzer J. "Health Care Utilization and Costs among Patients Treated for Bipolar Disorder in an Insured Population." *Psychiatric Services,* vol. 50, no. 10, 1999.

136. Simon GE, Von Korff M, Saunders K, Miglioretti DL, Crane PK, van Belle G, Kessler RC. "Association between Obesity and Psychiatric Disorders in the US Adult Population." *Archives of General Psychiatry,* vol. 63, no. 7, 2006.

137. Simon GE, VonKorff M, Rutter C, Wagner E. "Randomised Trial of Monitoring, Feedback, and Management of Care by Telephone to Improve Treatment of Depression in Primary Care." *British Medical Journal,* vol. 320, no. 7234, 2000.

138. Stanton MW. *The High Concentration of U.S. Health Care Expenditures.* Rockville: Agency for Healthcare Research and Quality, 2005.

139. Stein MB, Cox BJ, Afifi TO, Belik SL, Sareen J. "Does Co-Morbid Depressive Illness Magnify the Impact of Chronic Physical Illness? A Population-Based Perspective." *Psychological Medicine,* vol. 36, no. 5, 2006.

140. Steiner BD, Denham AC, Ashkin E, Newton WP, Wroth T, Dobson LA. "Community Care of North Carolina: Improving Care through Community Health Networks." *Annals of Family Medicine,* vol. 6, no. 4, 2008.

141. Strine TW, Mokdad AH, Balluz LS, Gonzalez O, Crider R, Berry JT, Kroenke K. "Depression and Anxiety in the United States: Findings from the 2006 Behavioral Risk Factor Surveillance System." *Psychiatric Services,* vol. 59, no. 12, 2008.

142. Thielke S, Vannoy S, Unutzer J. "Integrating Mental Health and Primary Care." *Primary Care,* vol. 34, no. 3, 2007.

143. Turner RJ. "Social Support and Coping." In *A Handbook for the Study of Mental Health: Social Contexts, Theories, and Systems*, Horowitz AV and Scheid TL (eds). Cambridge: Cambridge University Press, 1999, pp. 198–210.

144. Unutzer J, Katon W, Callahan CM, Williams JW, Jr., Hunkeler E, Harpole L, Hoffing M, Della Penna RD, Noel PH, Lin EH, Arean PA, Hegel MT, Tang L, Belin TR, Oishi S, Langston C. "Collaborative Care Management of Late-Life Depression in the Primary Care Setting: A Randomized Controlled Trial." *Journal of the American Medical Association,* vol. 288, no. 22, 2002.

145. Unutzer J, Katon WJ, Fan MY, Schoenbaum MC, Lin EH, Della Penna RD, Powers D. "Long-Term Cost Effects of Collaborative Care for Late-Life Depression." *American Journal of Managed Care,* vol. 14, no. 2, 2008.

146. U.S. Census Bureau. n.d.; *www.census.gov/.* Accessed September 3, 2010.

Appendix I References

147. Valderas JM, Starfield B, Sibbald B, Salisbury C, Roland M. "Defining Comorbidity: Implications for Understanding Health and Health Services." *Annals of Family Medicine,* vol. 7, no. 4, 2009.

148. van den Akker M, Buntinx F, Metsemakers JFM, Roos S, Knottnerus JA. "Multimorbidity in General Practice: Prevalence, Incidence, and Determinants of Co-Occurring Chronic and Recurrent Diseases." *Journal of Clinical Epidemiology,* vol. 51, no. 5, 1998.

149. Vilhjalmsson R. "Direct and Indirect Effects of Chronic Physical Conditions on Depression: A Preliminary Investigation." *Social Science & Medicine,* vol. 47, no. 5, 1998.

150. Von Korff M, Katon W, Bush T, Lin EHB, Simon GE, Saunders K, Ludman E, Walker E, Unutzer J. "Treatment Costs, Cost Offset, and Cost-Effectiveness of Collaborative Management of Depression." *Psychosomatic Medicine,* vol. 60, no. 2, 1998.

151. Wagner EH, Austin BT, Davis C, Hindmarsh M, Schaefer J, Bonomi A. "Improving Chronic Illness Care: Translating Evidence into Action." *Health Affairs,* vol. 20, no. 6, 2001.

152. Wagner EH, Austin BT, VonKorff M. "Organizing Care for Patients with Chronic Illness." *Milbank Quarterly,* vol. 74, no. 4, 1996.

153. Weisner C, Mertens J, Parthasarathy S, Moore C, Lu Y. "Integrating Primary Medical Care with Addiction Treatment—A Randomized Controlled Trial." *Journal of the American Medical Association,* vol. 286, no. 14, 2001.

154. Wells KB, Hays RD, Burnam MA, Rogers W, Greenfield S, Ware JE. "Detection of Depressive Disorder for Patients Receiving Prepaid or Fee-for-Service Care—Results from the Medical Outcomes Study." *Journal of the American Medical Association,* vol. 262, no. 23, 1989.

155. Wilhide S, Henderson T. *Community Care of North Carolina: A Provider-Led Strategy for Delivering Cost-Effective Primary Care to Medicaid Beneficiaries.* Washington: American Academy of Family Physicians, 2006.

156. Willenbring ML, Olson DH. "A Randomized Trial of Integrated Outpatient Treatment for Medically Ill Alcoholic Men." *Archives of Internal Medicine,* vol. 159, no. 16, 1999.

157. Williams JW, Gerrity M, Holsinger T, Dobscha S, Gaynes B, Dietrich A. "Systematic Review of Multifaceted Interventions to Improve Depression Care." *General Hospital Psychiatry,* vol. 29, no. 2, 2007.

158. Young AS, Klap R, Sherbourne CD, Wells KB. "The Quality of Care for Depressive and Anxiety Disorders in the United States." *Archives of General Psychiatry,* vol. 58, no. 1, 2001.

Notes

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