

Chapter 2

Behavioral Health Conditions: Direct Treatment Costs and Indirect Social Costs

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Key Terms

Absenteeism	A habitual pattern of absence from the workplace usually as a result of a medical or mental health condition.
Co-located Models of Care	Co-located models of care are mid-level models in the integration spectrum that locate behavioral health providers in the same location as primary care without system-wide integration.
Cost–Effectiveness Analysis	CEA is a method of economic evaluation that assesses the costs and health outcomes of a therapy, intervention, program, or policy. Costs are compared to the intervention’s effectiveness, which is measured in terms of health outcomes (e.g., depression-free days or quality adjusted life years). Results are presented as a cost per health outcome, which is often referred to as a cost–effectiveness ratio. Programs can be compared using the same outcome or a single intervention can be examined and compared to a standard threshold (e.g., the cost per QALY threshold that is commonly accepted in

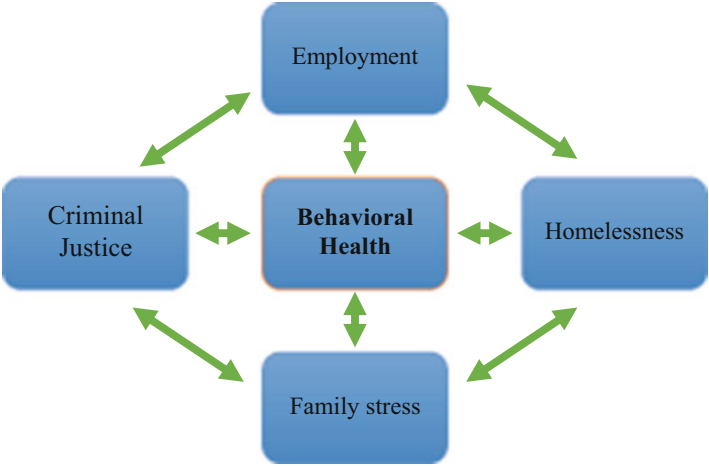
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	the health care arena as acceptable is anything under \$50,000 per QALY).
Cost–Benefit Analysis	CBA is a method of economic evaluation whereby all the positive (beneficial) and negative (costly) consequences of a therapy, intervention, program, or policy are expressed in monetary terms. The valuation of the outcomes in monetary terms (e.g., dollars) allows for direct comparisons of health outcomes so that those who are making a decision, whether individuals, providers, or policy makers, can make decisions using an “apples to apples” technique.
Cost Offsets	Cost offsets occur when less medical care is provided as a result of behavioral health services that led to prevention of medical conditions.
Efficacy	The measure of how well a treatment works in a controlled atmosphere such as a clinical trial.
Effectiveness	The measure of how well a treatment works in a real world setting (e.g., as it is delivered in the health care system with users going about their lives outside of a controlled environment).
Incidence	Incidence is the number of new cases of a condition over a specified period of time. It is a rate as the time period is an important part of determining incidence.
Integrated Care Models	Integrated care models are models where the behavioral health providers are not only located in the same place but are also close to or fully integrated with respect to service delivery.
Leveraging	Savings that occur as a result of less time spent by the physician on behavioral health as a result of the behavioral health provider taking on treatment for those issues.
Prevalence	Prevalence is the proportion of a specific population that has a problem at a specific point in time. It is a proportion and is a cross-sectional metric of disease burden.
Transinstitutionalization	The shift from institutionalization of those with a mental health condition within the hospital system to the institutionalization within the prison system.

Introduction

Behavioral health conditions, including both mental health and substance use conditions, are prevalent and costly. Mental health conditions, which disrupt thoughts, mood, and behavior, include disorders such as anxiety disorders, bipolar disorder,



Schematic 2.1 Possible causal relationships among variables associated with behavioral health conditions

post-traumatic stress disorder (PTSD), and depression (Centers for Disease Control and Prevention, 2013). Substance use diagnoses cover a range of conditions, including dependence and use of substances that are detrimental to the individual’s health or detrimental to others and addiction disorders (American Psychiatric Association, 2013). The CDC estimates that 17.8 % of the population experienced a mental illness during 2011, while 8.5 % experienced a substance use disorder. Expenditures on mental health and substance use treatment totaled \$180.9 million in 2009, which accounted for 7.4 % of expenditures on all health conditions (Substance Abuse and Mental Health Services Administration, 2013a, 2013b, 2013c). Behavioral health conditions also impose substantial non-monetary costs: for example, ADHD is more likely to contribute to childhood disability in the USA than asthma (Currie & Kahn, 2012).

Full implementation of the Patient Protection and Affordable Care Act (PPACA) is expected to reduce financial barriers to behavioral health care through the Medicaid expansion, expansion of mental health parity provisions, elimination of preexisting condition exclusions for individuals purchasing insurance through exchanges, limits on out-of-pocket expenditures for prescription drugs, and implementation of organizational structures (e.g., Affordable Care Organizations (ACOs) and Patient Centered Medical Homes (PCMH)) with new incentives to provide coordinated comprehensive care. Increased utilization of behavioral health care is expected as individuals and providers respond to these changes. For example, Currie, Stabile, and Jones (2013) find that increased coverage of prescription drugs in Canada led to increasing use of medications for ADHD in children (Currie et al., 2013). This evidence does not indicate whether the increase in treatment utilization is appropriate: however, 37 % of US adults with serious mental illness did not receive mental health treatment during the year preceding the 2012 survey (Substance Abuse and Mental Health Services Administration, 2013a, 2013b, 2013c).

This increase in utilization will occur in the context of evolving patterns of care. Inpatient care declined in recent decades, while prescription drug utilization increased. In 2009, inpatient hospital stays accounted for 26 % of mental health care expenditures, and 31 % of substance use treatment expenditures (see Table 2.1). Pharmaceuticals accounted for 28 % of mental health treatment expenditures, but only 4 % of expenditures for substance use treatment. Office-based professional services accounted for 15–16 % of expenditures for treatment of both types of conditions. Within “office-based professional services” the roles of psychiatrists, non-psychiatrist physicians, and other professions (e.g., counselors, psychologists, and social workers) has shifted over the last two decades. Psychiatrists account for a shrinking proportion of office-based professional service expenditures: psychiatrists accounted for 35 % of these services for mental health conditions in 2009, down from 45 % in 1990, and psychiatrists accounted for 7 % of these services for substance use treatment in 2009, down from 12 % in 1990. While psychiatrists play a reduced role, the share of non-psychiatrist physicians grew from 23 % in 1990 to 32 % in 2009, and the role of other professionals (e.g., counselors, psychologists, and social workers) grew from 54 % to 71 % during those years (Substance Abuse and Mental Health Services Administration, 2013a, 2013b, 2013c). Treatment strategies and professional roles are expected to continue to evolve, as the health care industry continues to respond to fiscal pressure created by ongoing increases in health care expenditures, technological innovation, and the recent changes introduced by the PPACA.

As mental health treatment strategies evolve, it will be important to analyze the costs and benefits of specific strategies for treating behavioral health conditions. This chapter will provide information about the prevalence of mental health and substance use conditions, examine treatment costs and indirect social costs for those conditions, and consider evidence about the cost-effectiveness of the integrated care treatment strategy.

Table 2.1 Mental health and substance use expenditures in 2009, by type of provider

	Mental health (%)	Substance use (%)
Hospital	26	31
Pharmacy	28	4
Office-based professionals	16	15
<i>Psychiatrists</i>	6	1
<i>Non-psychiatrist physicians</i>	5	3
<i>Other professions</i>	5	11
Specialty center	15	35
Other	15	15

Source: Behavioral Health, United States, 2012. US Department Of Health And Human Services Substance Use and Mental Health Services Administration (SAMHSA). www.samhsa.gov. (Table 125)

Prevalence of Behavioral Health Disorders

Over a quarter of Americans adults (age 18 and older) have a diagnosable mental health or substance use disorder (Kessler, Chiu, Demler, & Walters, 2005). Anxiety disorders (e.g., panic disorder, generalized anxiety disorder) are the most prevalent followed by impulse disorder (e.g., oppositional defiance disorder, conduct disorder), mood disorders (e.g., major depressive disorder, bipolar disorder), and substance use disorders (see Table 2.2).

The severity of mental health conditions varies across disorder group. Serious severity is most prevalent among individuals with mood disorders and substance use (see Fig. 2.1).

Table 2.2 Prevalence of behavioral health disorder among US adults, by disorder group

Disorder group	12 month prevalence (%)
Anxiety disorder	19.0
Mood disorder	9.7
Impulse disorder	10.5
Substance disorder	3.8

Source: Mental Health, United States, 2010. Substance Use and Mental Health Services Administration (SAMHSA). http://www.samhsa.gov/data/2_k12/MHUS2010/MHUS-2010.pdf (Table 2.2)

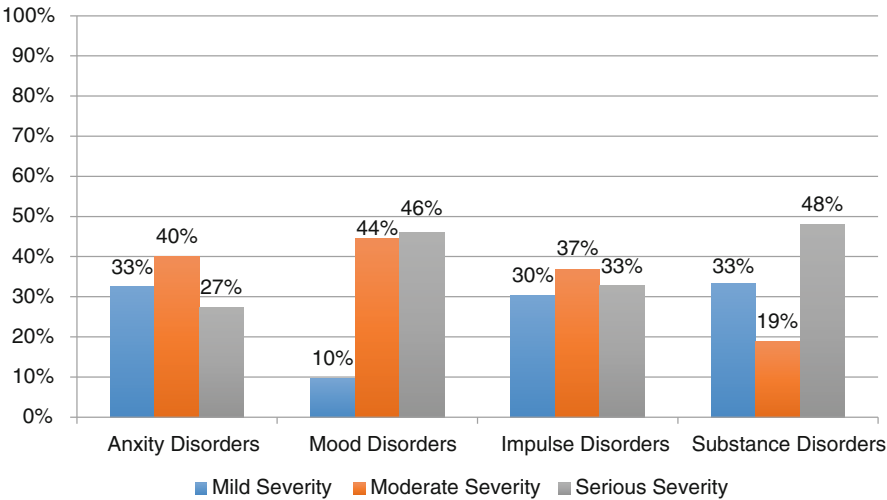


Fig. 2.1 Prevalence of behavioral health disorders among US adults, by severity within disorder group. Source: Mental Health, United States, 2010. Substance Use and Mental Health Services Administration (SAMHSA). http://www.samhsa.gov/data/2_k12/MHUS2010/MHUS-2010.pdf (Table 2.2)

Mental health conditions often occur in clusters (see Table 2.3): of those who had any disorders, approximately half had two or more disorders (Substance Abuse and Mental Health Services Administration, 2012). Co-occurring behavioral health conditions and co-occurring behavioral health and physical health conditions can exacerbate each other. For example, Gadermann (2012) found that individuals with depression or panic/agoraphobia have lower perceived health than individuals who have comparable physical diagnoses but do not have a co-occurring mental health diagnosis (Gadermann, Alonso, Vilagut, Zaslowsky, & Kessler, 2012).

Adolescents in the USA are also at risk of behavioral health conditions (see Table 2.4). A representative sample of over 6,500 adolescents in the USA was assessed for fear disorders (e.g., panic and phobias), distress disorders (e.g., depression, GAD, PTSD), behavior disorders (e.g., ADHD), substance disorders, and other disorders (e.g., bipolar) (Kessler et al., 2012). Co-occurrence of disorders is common among adolescents, with over a quarter this sample meeting criteria for two or more disorders (Kessler et al., 2012). Co-occurrence typically involves disorders in the same class (e.g., distress disorders more commonly occurred with other distress disorders than with a disorder in a different class) (Kessler et al., 2012).

The World Health Organization (WHO) recognizes mental health as an important issue worldwide. Across countries, the prevalence of mental health disorders increases as income increases. Alonso (2011) reports that the prevalence of any mental health condition ranges from 12 % in low- and lower-middle-income coun-

Table 2.3 Percentage with one, two, or three or more behavioral health disorders among US adults with any diagnosis of a mental health disorder

Number of disorders	12 month prevalence
One disorder	52.8
Two disorders	23.0
Three or more disorders	24.5

Source: Mental Health, United States, 2010. Substance Use and Mental Health Services Administration (SAMHSA). <http://www.samhsa.gov/data/2k12/MHUS2010/MHUS-2010.pdf> (Table 2.2)

Table 2.4 Prevalence of behavioral health disorder among US adolescents, by disorder group

Disorder group	Prevalence (%)
Fear disorder	26.1
Distress disorder	25.4
Behavior disorder	22.7
Substance disorder	11.4
Other disorder	6.2

Source: Kessler RC, Avenevoli S, McLaughlin KA, Greif Green J, Lakoma MD, Petukhova M, Pine DS, Sampson NA, Zaslavsky AM, Merikangas KR. “Lifetime comorbidity of DSM-IV disorders in the NCS-R adolescent supplement (NCS-A).” *Psychol Med* 2012;42(9):1997–2010

tries, to 15 % in upper-middle-income countries and 17 % in high-income countries (Alonso et al., 2011). Major depression disorder (MDD) was the most common diagnosis in all income-tiers. This disorder is the fourth leading cause of disability across the world and the WHO estimates that it is likely to become the second leading cause of disability by 2020 (World Health Organization, 2001). Co-occurring disorders are common in this international data, with co-occurring mental health disorders being more prevalent than co-occurrence between mental and physical health conditions (Alonso et al., 2011).

Assessing Costs and Benefits of Behavioral Health Care

Treating mental health and substance use disorders imposes direct costs on health care payers and patients; however, lack of effective treatment imposes indirect costs on individuals, families, employers, and taxpayers.

Treatment Costs for Behavioral Health

Analyses of treatment costs for specific diagnoses provide insight into health care utilization associated with those disorders. Depression is the most common mental health condition. Over 17 million US adults received treatment for depression in 2009, which constituted a 74 % increase in numbers of adults being treated over the previous decade (Soni, 2012). Expenditures to treat this condition totaled \$22.8 billion in 2008, with \$16.7 billion spent on treatment of women and \$6.1 billion on treatment for men (Soni, 2012). On average, individuals with expenditures for treating depression also incurred ambulatory care expenditures for depression treatment of nearly \$1,000, and prescription drug costs of \$700 in 2009 (Soni, 2012). Mental health services utilization increases with condition severity. For 539 US workers with Major Depressive Disorder, whose conditions were categorized as mild (13.8 %), moderate (38.5 %), or severe (47.7 %), average annual treatment costs for those with severe MDD were significantly higher than costs for individuals with moderate or mild MDD for both mental health services (\$697 versus \$388, respectively) and for antidepressant drugs (\$256 versus \$88, respectively) (Birnbaum et al., 2010).

Treatment for other mental health disorders is also costly. The estimated treatment cost for bipolar disorder exceeded \$150 million in 2009 (Dilsaver, 2011), and the cost of treating PTSD among members of the military is estimated at \$200 million per year (Harrison, Satterwhite, & Ruday, 2010). Analysis of health care utilization for patients with psychosis found that expenditures for individuals with a psychosis diagnosis averaged \$62,500 per year. On average, these expenditures covered 6.4 annual inpatient days, 1.4 physician visits, one counselor visit, and six visits for testing and diagnostics (Hjortsberg, Helldin, Hjaerthag, & Loethgren, 2011). Health care costs following suicide attempts average \$25,000 per year, with

over a quarter of those costs occurring in the month after a suicide attempt to address injuries sustained in the attempt (Stensland, 2010). Average expenditures during the year following the suicide-attempt are double average expenditures during the preceding year, due to both treatment of the impact of suicide attempt and prolonged increases in treatment intensity following the attempt (Stensland, 2010).

Indirect medical costs associated with worse physical health also increase for individuals with mental health conditions. Older adults with a depression diagnosis incur annual Medicare claims of \$23,000 while individuals without a depression diagnosis incur claims closer to \$13,000 (Unützer et al., 2009). More specifically, co-occurring depression is associated with elevated costs for treating diabetes (Simon et al., 2007), and HIV (Rothbard, Metraux, & Blank, 2009). However, this association between depression and the cost of treating diabetes or HIV must be interpreted with caution. The direction of the causal pathway is not known. Individuals with depression may incur higher medical costs to treat specific medical conditions because the co-occurring behavioral health disorder interferes with health care utilization or treatment compliance. On the other hand, individuals with more severe medical conditions could suffer from more severe behavioral health conditions as a result of either depression stemming from the individual's physical health issues, or from self-medication that leads to substance use.

In the USA, Medicaid is the largest payer for behavioral health care, followed by private insurance, other state and local government services, and Medicare (Shirk, 2008). The prominent role of Medicaid as a payer for behavioral health care could reflect the associations between mental health diagnoses, poverty, and unemployment. The Medicaid expansions generated by the PPACA, are expected to increase the degree to which Medicaid payment policies impact behavioral health care providers and patients in many states.

Indirect Costs Associated with Behavioral Health Conditions

Behavioral health conditions are associated with an array of monetary and non-monetary costs. However, association does not imply causation. The direction of causality between behavioral health and associated negative outcomes (e.g., lower rates of employment, homelessness) is often bidirectional. These relationships may also be multidimensional, with causal mechanisms that include interactions among multiple behavioral health conditions and social issues. For example, correlations between mental health and substance use indicate that these disorders are linked, and both of these conditions are associated with unemployment, family stress, school performance issues, and homelessness. The causal mechanisms are not clearly specified, but it appears that interactions among multiple variables play important roles. Unemployment could lead to homelessness, while being homeless makes it more difficult to obtain employment. Homelessness and unemployment could contribute to incarceration, which would make it more difficult to find subsequent employment and housing (see Schematic 1). This complex web of

interactions has implications for designing effective treatment programs to address behavioral health disorders, for designing effective programs to address key social issues, and for designing strategies to assess the impacts and cost-effectiveness of these programs.

Employment Mental health conditions are associated with a variety of employment-related costs. Employment rates are lower for individuals with mental health conditions. The presence of one mental health condition reduces the chances of labor market participation by a percentage point, and the impacts are additive for individuals with multiple mental health conditions (Cornwell, Forbes, Inder, & Meadows, 2009). These effects can persist over an individual's work-life. Diagnosis of ADHD or antisocial conduct at age 10 is associated with reduced rates of subsequent adult employment (Knapp, King, Healey, & Thomas, 2011). Cornwell (2009) posits that this could reflect reduced skill levels among those with mental health conditions. Among children diagnosed with ADHD or anxiety disorders who obtained subsequent employment as adults, wages were lower than wages for adults who did not have these previous diagnoses (Knapp et al., 2011).

Labor market impacts of mental health conditions are especially pronounced among women. Employment status is negatively associated with psychiatric disorders for women, but not for men (Cowell, Luo, & Masuda, 2009). Diagnosis of anxiety disorder reduces the odds of employment for both men and women; however the impact is significantly larger for women (Cowell et al., 2009). Mood disorders were associated with lower rates of employment for women but not for men (Cowell et al., 2009).

Employed individuals with mental health conditions face higher risk of voluntary and involuntary termination (Nelson & Kim, 2011). In particular, depression is associated with early exit from the job market (Falba, Sindelar, & Gallo, 2009), and unemployment (defined to include individuals who are looking for work and those who are disabled and unable to work for a period of at least 6 months) increases significantly as the severity of major depressive disorder increased (Birnbaum et al., 2010). This association could reflect a negatively reinforcing feedback loop. Employment is usually associated with improvements in mental health, and job loss is associated with reduced mental health. However, Cottini (2011) found that bad working conditions have adverse effects on mental health (Cottini, Kato, & Westergård-Nielsen, 2011). Individuals with mental health conditions (who could potentially benefit most from the positive mental health benefits of employment) are also at greater risk of termination (Nelson & Kim, 2011). The negative association between employment and mental health disorders may contribute to the observed correlation between poverty and severe mental health conditions. The odds of being poor are three-times higher for households that include an individual with a severe psychiatric disorder, compared to households that do not include individuals with such disorders (Vick, Jones, & Mitra, 2012).

Unemployment and underemployment impose costs on the individual, and they also impose costs on society. Untreated ADHD is associated with a substantial loss of tax revenue, compared with the taxes paid by a cohort of people who do not have ADHD (Kotsopoulous, Connelly, Sobanski, & Postma, 2013).

Absenteeism Mental health conditions are associated with reduced workplace productivity and elevated absenteeism, with depression being one of the leading causes of both (Donohue & Pincus, 2007). Individuals with severe or moderate depression miss significantly more days of work than non-depressed employees, and these employees incur statistically significant losses in salary as a result of this absenteeism (Birnbaum et al., 2010). Birnbaum estimates that the depression-related productivity losses totaled \$2 billion per month for the US labor market (Birnbaum et al., 2010).

The World Health Organization (WHO) researched absenteeism associated with ten physical health and nine mental health conditions in 24 countries. Two of the three conditions associated with high absenteeism were mental health conditions (Alonso et al., 2011). Across all countries, bipolar disorder and PTSD were associated with the second and third highest absenteeism rates, after adjusting for individual and employment characteristics (Alonso et al., 2011). In low-income countries, the top four conditions associated with high absenteeism include generalized anxiety disorder (24.6 days missed per year), bipolar disorder (23.4 days missed per year), and panic disorders (17.6 days missed per year) (Alonso et al., 2011). PTSD is also associated with high absenteeism (16.2 days missed per year) in high-income countries (Alonso et al., 2011).

Homelessness The positive association between homelessness and behavioral health conditions also reflects bidirectional causality. Individuals with behavioral health conditions may be more likely to be homeless, while the difficult life conditions faced by homeless people may exacerbate mental health conditions. Fifteen percent of a large sample of people already in treatment for depression, bipolar disorder, and schizophrenia in a large, public mental health system were homeless (Folsom et al., 2005). Co-occurrence of behavioral health and substance use conditions may be prevalent among homeless individuals; Drake (1997) estimates that 50–70 % of homeless individuals with mental health conditions also use substances (Drake, Yovetich, Bebout, Harris, & McHugo, 1997). This co-occurrence of mental health and substance use conditions may contribute to increased utilization of inpatient and emergency department services (Folsom et al., 2005). The triad of homelessness, substance use, and mental health issues is also associated with other social issues. The relationship is well documented for women with a recent history of violence, low access to social support, and the presence of a chronic health issue (Chambers et al., 2014). Homeless youth have substantially higher rates of mental health issues and experiences with violence, compared with non-homeless youth (Cauce et al., 2000). In addition, children in foster care have higher rates of mental health conditions (Pecora et al., 2003), and individuals with this combination of experiences face elevated risk of future homelessness. Among a sample of young adults aged 19 through 25 years who had lived in foster care during their youth, the incidence of homelessness exceeds the incidence among young adults in the general population.

Criminal Justice While the numbers of inpatient behavioral health beds decreased in recent decades, the numbers individuals receiving behavioral health care in prisons and jails increased. The shift between these two institutional settings has been

termed transinstitutionalization. From 1978 to 2000 the numbers of inmates with a mental health issue housed in all federal and state prisons and county jails tripled from 209 to 708 per 100,000 US population (Lamb & Weinberger, 2005), and the concurrent reduction in inpatient mental health treatment capacity is cited as a contributing factor (Prins, 2011). Currently, two million people with serious mental illness are incarcerated each year in the USA, and one in four people with a serious mental illness (schizophrenia or bipolar disorders) were incarcerated over the course of 2 years (Swanson et al., 2013). Adolescents in the juvenile justice system have high rates of mental health conditions (Trupin, Walker, Burden, & Roberts, 2013). However, incarceration may not be an effective or efficient strategy for addressing behavioral health issues. Direct costs of incarceration for individuals with a mental health condition are double the costs of individuals with mental health conditions who are not incarcerated (Swanson et al., 2013). In addition, incarcerating individuals with mental health conditions generates indirect costs. Care-giving burdens are placed on family members, to care for children or parents of the incarcerated individual (Travis, 2005), the incarcerated individual is not contributing to the household's financial needs, and treatment of the mental health issue may be suboptimal if appropriate care is not available in the jail or prison.

Family Family circumstances can exacerbate mental health conditions, and mental health conditions may place stress on families. Children of mothers with untreated mental health issues have more behavioral issues (Coiro, Riley, Broitman, & Miranda, 2012) and higher rates of mental health issues, including non-depressive disorders (i.e., disruptive behavior disorder, attention deficit disorder, substance use disorder, anxiety, and eating disorders) than children of non-depressed mothers (Hammen, 2003). Children of mothers who are depressed also have worse psychosocial outcomes (e.g., competence in school and extracurricular activities, relationships with family and friends) and a higher risk of depression than those who do not have a depressed mother (Feder et al., 2009). When compared to depression in children of non-depressed parents, depression in children of depressed parents occurs earlier, persists for a longer duration, is associated with greater impairment, and is more likely to recur (Hammen, 2003; Warner, Weissman, Fendrich, Wickramaratne, & Moreau, 1992). The presence of alcohol dependence or serious mental illness among caregivers is associated with internalizing behaviors among the children receiving care from these individuals and serious mental illness of a caregiver is associated with externalizing behaviors among children (Miller, Orellana, Briggs, & Quinn, 2014). Gender interacts with these variables. The mental health of children with depressed mothers is worse than corresponding children with depressed fathers; children of depressed mothers are more likely to have both internalizing and externalizing issues than children of depressed fathers (Connell & Goodman, 2002; Goodman, 2007). Daughters of depressed mothers experience more chronic interpersonal and school behavior stress than daughters of mothers who are not depressed (Gershon et al., 2011).

Spousal relationships are also correlated with mental health issues. Separated and divorced people have higher rates of depression, though it is unclear whether the divorce led to the depression or whether mental health disorders led to divorce

(Weissman et al., 1996). Depression (and likely other mental health conditions) may lead to disruptions in the stability of the family unit, which often leads to marital dissatisfaction and separation (Lépine & Briley, 2011).

Residential instability among children is also linked with negative mental health outcomes though the direction of causality is not clear. For example, depression rates among alumni of foster care were higher than among the general public in the year after leaving care (White et al., 2009). Because the causal pathway is not understood, it is not clear whether increased residential stability would help to prevent this mental health disorder.

Assessing Cost-Effectiveness of Treatment Strategies

Public agencies, payers, providers, and patients make resource allocation decisions that impact the quantity and quality of services available to treat behavioral health disorders. These decisions require assessment of the costs and benefits of treatment strategies. Evaluating interventions requires resolution of two controversial questions:

- Should clinical guidelines incorporate comparison of costs and benefits of alternate treatments?
- What method should be used to compare monetary and non-monetary costs and benefits?

First, analysis of clinical effectiveness does not imply conclusions about cost-effectiveness. While many health care providers and analysts prefer to focus on clinical effectiveness, growing concerns about the magnitude of health care expenditures highlight the importance of the second issue of cost-effectiveness. However, combining analyses of clinical effectiveness with analyses of cost-effectiveness raises controversial issues. The British National Institute for Health and Care Excellence, which posts clinical guidelines for British health care providers, explicitly includes comparison of costs and benefits in the guideline determination process. In contrast, the US Patient Centered Outcomes Research Institute (PCORI) eschews comparison of costs and benefits: cost-effectiveness research is specifically prohibited and ineligible for funding (Patient-Centered Outcomes Research Institute, 2014). In the US system, clinical guidelines focus on clinical effectiveness (suspicion that the 2009 mammogram guidelines reflected implicit comparison of costs and benefits generated a significant negative political reaction). In this system, the issue of cost-effectiveness is addressed at the payer and provider level. Payment incentives encourage health care providers to develop efficient strategies for delivering health care to panels of patients. For example, Patient Centered Medical Homes (PCMH) are designed to provide access to coordinated comprehensive care (Katon & Unützer, 2013). Similarly, the PPACA created Accountable Care Organizations (ACOs) that focus on coordination of care across the full spectrum of providers to enhance patient outcomes while reducing the cost of delivering care.

This two-level strategy recognizes the value of payer, provider and patient innovation to strengthen coordination of care, continuity of care, and patient engagement in the process of care. Providing opportunity for innovation is essential given the rapid pace of change in the health care industry, the current lack of knowledge about optimal strategies for helping patients with diverse characteristics strengthen their health status, and the diverse entities currently experimenting with new approaches. Currie et al. (2013) provide an example of the potential value of the two-level strategy (Currie et al., 2013). After noting that the National Institute of Mental Health recommends that children with ADHD receive treatment with stimulants, these authors analyze data from the National Longitudinal Survey of Canadian Youth (NLSCY) to estimate the real-world impacts of implementation of this recommendation. This type of analysis addresses the problem that effectiveness of treatments implemented for large populations of patients may differ from the efficacy determined in controlled experimental settings. The NLSCY provides longitudinal data on a large panel of children from 1994 to 2008. All children included in the survey were assessed for ADHD symptoms, and the survey data includes self-reported information about the use of ADHD medications, along with data on school performance, family issues, depression, and self-reported happiness. Analysis of this large dataset does not find evidence that use of the ADHD medications is associated with long-term positive impacts. The authors suggest three possible explanations for the disconnect between the evidence of clinical efficacy produced by short-term clinical studies, and the lack of evidence of positive impacts on school performance, family relationships or self-reported happiness: (1) use of the ADHD medications may have generated a non-clinical “stigma” effect that produced unobserved negative side effects, (2) increased use of the ADHD medications substituted for cognitive or behavioral interventions (and discontinuation of these interventions produced negative impacts that offset the positive effects of the medications), or (3) individual children did not take optimal dosages for optimal periods of time (Currie et al., 2013). While clinical researchers would prefer to rely on carefully designed clinical studies, this large dataset analysis of the impact of a clinical intervention on non-clinical outcomes suggests that detailed study is also needed, beyond the level of the clinical trial, to develop implementation strategies that ensure that the potential clinical benefits are realized in real-world populations of children. As the use of electronic medical records (EMR) systems proliferates, new types of population-level data are emerging, and innovators are exploring strategies for utilizing that data to analyze population health issues. The two-level strategy provides flexibility for experimentation with implementation strategies. Post-implementation analysis can provide information that is essential for adjusting implementation strategies to ensure that clinical benefits are achieved.

Second, comparison of costs and benefits is challenging because mental health and substance use treatments generate monetary costs, but the benefits of effective treatment enjoyed by individuals, employers, families, and society can be difficult to measure in dollar terms. Analysts typically use *cost-benefit analysis*

or *cost-effectiveness analysis* to resolve this issue. In addition, providers working in a specific health care setting may analyze *cost-offset* (to assess whether implementation of a new strategy generates sufficient reduction in the costs of existing services to generate a net monetary benefit) or *leveraging* (to assess whether addition of a “physician-extender” allows the physician to generate a net monetary benefit by working more efficiently). (See Box 2.1 for more information about these strategies.)

Researchers use cost-effectiveness analysis (CEA) to compare the ratio of the cost of an intervention to the benefit of an outcome of interest (e.g., quality adjusted life year (QALY)). Cost-effectiveness analysis can be used to analyze the impact of a single intervention, or this strategy can be used to compare interventions using the same outcome to see which is *more* cost-effective. While originally applied to medical interventions, cost-effectiveness models have also been used to analyze behavioral interventions. This strategy is useful for analyzing whether resources are effectively allocated across alternate programs. A single cost-effectiveness study can answer the question: “does this program produce results?” Comparison of cost-effectiveness across a set of programs allows researchers, practitioners, and policy makers to ensure that they obtain maximum results for the money they have to spend.

Researchers use cost-benefit analysis (CBA) when both the costs and the benefits are expressed in monetary terms. Expressing all inputs and outcomes in dollar terms allows the researcher to assess whether the intervention was cost saving, cost

Box 2.1 Strategies to analyze economic effectiveness	
Cost-Benefit Analysis:	A method of economic evaluation whereby all the positive (beneficial) and negative (costly) consequences of a therapy, intervention, program, or policy are expressed in monetary terms. The valuation of the outcomes in monetary terms allows for direct comparisons of health outcomes so that individuals, providers, or policy makers, can make decisions using an “apples to apples” technique.
Cost-Effectiveness Analysis:	A method of economic evaluation that assesses the costs and health outcomes of a therapy, intervention, program, or policy. Costs are compared to the intervention’s effectiveness, which is measured in terms of health outcomes (e.g., quality adjusted life years). Results are presented as a cost per health outcome, which is often referred to as a cost-effectiveness ratio.
Cost Offset:	Cost offsets occur when less medical care is provided as a result of behavioral health services that led to prevention of medical conditions
Leveraging:	Savings that occur as a result of less time spent by the physician on behavioral health as a result of the behavioral health provider taking on treatment for those issues.

Box 2.2 Key differences between cost–effectiveness and cost–benefit analysis		
	Cost–effectiveness analysis	Cost–benefit analysis
Benefit Quantification:	Expressed in clinically meaningful units (e.g., QALY)	Expressed in monetary units
Basic Outcome Assessment:	CE Ratio = (Total Cost)/(Units of Effectiveness)	Net Benefits = (Total Benefits) — (Total Costs)
Decision Making Threshold:	(a) If evaluating two programs than implement the one with the lowest CE ratio within reason (b) If evaluating one program, the standard in health care for approval is ≤ \$50,000 per QALY	If the present value benefits are greater than costs (a positive net benefit) then the program or policy should be accepted

neutral, or just costly (see Box 2.2 for a comparison of key differences between CBA and CEA). While a cost–effectiveness study is useful or analyzing an intervention designed to increase depression-free days, cost–benefit analysis is logical for examining the labor market outcomes that attach dollar values to the outcomes “days of work missed” or “hours of productivity lost”.

Both strategies raise the question: which costs will be included in the analysis? Payers and providers responding to incentives to reduce health care costs are likely to focus on degree to which investment in behavioral health care strengthens physical health while reducing physical health care costs. However, states may address a wider set of issues. States provide funding for Medicaid programs, criminal justice programs, and social services/public health programs that address the needs of homeless individuals and families. Impacts of mental health care on social issues are therefore relevant to states, as they set Medicaid reimbursement policies. Because Medicaid is typically a major payer for behavioral health services, Medicaid reimbursement policies are important to behavioral health care providers.

Evidence: Is Integrated Care an Efficient Strategy?

Interventions for behavioral health conditions include pharmacologic interventions and psychosocial interventions. Single-drug treatments and co-administered pharmaceuticals have been assessed and determined to be cost-effective methods of treatment. There are cost-effective pharmacologic methods of treating depression (Kaplan & Zhang, 2012; Snedecor et al., 2010), bipolar disorder (Sawyer et al., 2014), and a variety of other mental health conditions (Andrews, Sanderson, Corry,

& Lapsley, 2004) for both adolescents and adults in all age groups. Studies also demonstrate effectiveness for psychosocial interventions. This section focuses on the implementation issue of coordination between primary care and any type of behavioral health care.

Integrated Care Integrated care is designed to strengthen coordination of primary care and behavioral health care to provide a cost-effective strategy for improving patients' behavioral health conditions and physical health conditions (Collins, Hewson, Munger, & Wade, 2010). There are three broad types of integrated care:

- Coordination may occur through collaboration between primary care and behavioral health care providers who are not co-located,
- Onsite collaboration may occur between co-located care providers without integration of systems, or
- Collaboration of co-located professional may occur with some level of practice integration (Substance Abuse and Mental Health Services Administration, 2013a, 2013b, 2013c)

Integrating behavioral health care into primary care where patients are already being seen helps reduce fragmentation and allows for a “soft” entry into care for individuals who cannot manage additional appointments and for those who are concerned that accessing behavioral health care may lead to stigma. Integration also addresses the issue that primary care providers may be reluctant to treat mental health issues due to undertraining in this area, lack of knowledge about community resources, lack of availability of community resources, or lack of reimbursement for these services (Agency for Healthcare Research and Quality, 2012). Models of integrated care were developed to address these issues. Kaiser Permanente pioneered some of this work, the Veterans Health Administration system utilizes integrated care, and the WHO recommends implementation of integrated care models as an effective care delivery strategy (World Health Organization, 2008). Finally, integration helps address behavioral health and physical health in an efficient manner; integrated treatment of the two sets of conditions can reduce cost while strengthening health outcomes (Blount et al., 2007).

Behavioral health conditions can result in physical health conditions if untreated: 14 % of physical health conditions worldwide have been attributed to behavioral health conditions (Prince et al., 2007). Integrating care can help address the combination of mental health and physical health conditions more effectively and efficiently than treating the two sets of issues separately. Integrated care has been shown to be both clinically effective and cost-effective for treating pain (Boscarino et al., 2012), diabetes mellitus (Bogner, Morales, de Vries, & Cappola, 2012), coronary heart disease (VonKorff et al., 2011), and HIV/AIDS (Kaaya et al., 2013). While coordinated practice models generate some cost savings, co-located and integrated models enhance opportunities to leverage physician time and reduce physical health care costs enough to offset the cost of providing the behavioral health care (Collins et al., 2010). Care models that are co-located and/or integrated also show improved health outcomes, reduced utilization, and fewer problems with continuity of care compared to treatment-as-usual in primary care, thereby improving the experience with the health care system (Collins et al., 2010).

Integrating treatment for substance use into primary care settings reduces costs incurred by patients with medical conditions related to substance use (Hilton et al., 2003). Patients treated in integrated care settings incurred fewer hospital inpatient stays and fewer emergency department visits than patients treated in traditional settings (Parthasarathy & Weisner, 2005). Those with depression receiving integrated care had almost 17 additional depression free days over a 6 month follow-up with an incremental cost-effectiveness per depression free day of \$22 (Simon et al., 2001). Integrated care also generated improved outcomes for patients with co-occurring diabetes and depression (Bogner et al., 2012). Integrated care in which specialized nurses delivered a 1 year stepped-care depression treatment intervention within a primary care clinic generated 61 additional depression-free days and lower outpatient costs than usual care over 2 years of follow-up (Simon et al., 2007). Depressive symptoms decreased and remission rates increased among a population of veterans with depression treated in an integrated mental health intervention (Engel, Malta, Davies, & Baker, 2011).

While most research has focused on adult populations (usually aged 18–64 years) in typical primary care settings, integrated care management is also cost-effective among older and younger populations and in other care settings. Among older populations, integrated care is clinically beneficial and cost-effective in a variety of settings and countries (MacAdam, 2008). Care management that integrates social and medical care for older adults in Italy reduced hospitalization and home visits, though there was little change in community health services (e.g., home support and nursing care) over a 1-year follow-up (Bernabei et al., 1998). Savings were approximately \$1,800 per year in the intervention group, physical functioning was improved, and cognitive decline was reduced (Bernabei et al., 1998). Integrated care has been shown to be cost-effective over a 6-month period, for older veterans with depression who were treated at the Department of Veterans Affairs (VA) (Wiley-Exley, Domino, Maxwell, & Levkoff, 2009). Integrated care interventions have also proven cost-effective among populations of children. Integrated care for children with mental health conditions reduced emergency department and inpatient psychiatric visits, and the children were more likely to remain in the least restrictive setting possible than children who received usual, non-integrated care (Grimes et al., 2011).

For individuals who are homeless and suffer from behavioral health issues, full service partnerships that integrate housing and treatment have been shown to reduce the numbers of homeless days per year, and reduce the likelihood of receiving inpatient treatment, emergency services, and contact with the justice system. There was no statistically significant effect on employment rates; however employment impacts could take longer to actualize than the year of follow-up in this study (Gilmer, Stefanic, Ettner, Manning, & Tsemberis, 2010). Full service partnerships led to better quality of life and higher outpatient and housing costs. However, costs for inpatient, emergency departments, and mental health services in jails decreased enough to offset 82 % of the cost of program (Gilmer et al., 2010). Finally, preliminary results indicate that a large-scale model of integrated care in Washington is reducing both homelessness and arrests (Unützer et al., 2009).

Integrated care is not unique to the USA; this care delivery strategy has been shown to be cost-effective in both developing and developed countries. In India and Pakistan, integrated care systems achieved improvements in symptoms, disability, and quality of life while reducing costs in three out of four study sites (Chisolm et al., 2000). In South Africa, hiring lower level mental health workers in integrated care settings generated cost offsets by reducing utilization of more costly specialty care (Peterson, Lund, Bhana, & Flisher, 2012). In Italy, integrated care reduced hospitalizations, improved physical functioning, reduced declines in cognitive functioning, and generated cost savings for older adults followed for 1 year (Bernabei et al., 1998). In Australia, integrated care for older adults reduced emergency department utilization, inpatient admissions, and lengths of stay, while exhibiting cost-effectiveness over the usual care (Bird, Kurowski, Dickman, & Kronborg, 2007).

Other Treatment Options Innovators are demonstrating clinical effectiveness and cost-effectiveness for a range of additional treatment strategies. Evidence for two of these strategies, computer-delivered cognitive behavioral therapy (CBT) and enhanced depression treatment (which usually involves some combination of screening, telephone outreach, care management, and therapy) are discussed here, because these strategies could potentially complement integrated care strategies.

Computer-delivered cognitive behavioral therapy (CCBT) generates clinically effective and cost-effective results. CCBT, which can be valuable in medically underserved areas, relies on computer-based lessons and exercises done by the user at home or at medical facility. Compared to usual care, the direct costs of CCBT service delivery in the primary care setting (including the cost to license the software plus overhead and capital costs of delivering this service in primary care offices) were higher than those in usual care, which consisted of talking to primary care providers, referrals, and treatment of physical health. However the indirect costs of lost employment were lower for the CCBT group and, thus, the intervention group did end up being cost-effective when compared with the group randomized to receive treatment as usual (McCrone et al., 2004). This type of cost-benefit comparison, which includes up-front setup expenditures, is sensitive to the volume of users. A program of this type could potentially be cost-effective in a high-volume setting, but the reverse could be true in a low-volume setting.

Enhanced depression care has also been shown to generate benefits that exceed costs. An enhanced depression treatment designed to reduce absenteeism and increase productivity generated a small net benefit for the employer program during the first year, and a much larger net benefit in the second year of the intervention (Lo Sasso, Rost, & Beck, 2006). Wang (2006) assessed enhanced depression care, which consisted of depression screening and care management for those who qualified as depressed, versus usual care (Wang et al., 2006). Reduced absenteeism generated a net benefit of almost \$3,000 after 5 years for the employer, which provides further support for the hypothesis that productivity and absenteeism outcomes are generated over multiyear periods. Bhui's (2012) review of workplace interventions found that individual interventions improve mental

health but organizational interventions have a bigger impact on absenteeism (Bhui, Dinos, Stansfeld, & White, 2012).

These interventions are shown to be economically efficient and can be delivered through integrated care. Additional research is needed to assess whether integrated care offers a treatment setting that can enhance the value of these strategies over the value they provide as stand-alone treatments.

Conclusion

Behavioral health conditions are prevalent and costly (Alonso et al., 2011; Soni, 2012). They also have far reaching consequences, beyond the direct health consequences to the individual. Behavioral health disorders may exacerbate the consequences of physical health conditions. They are also correlated with social issues such as homelessness, incarceration, unemployment, and family stress. Developing effective treatment strategies is important, to strengthen behavioral and physical health, to address relevant social issues, and to reduce the costs of providing behavioral and physical health care.

However, links between behavioral health and social issues include a complex web of interactions. While research documents strong correlations, the causal mechanisms underlying these correlations are not fully understood. In many cases, causality is probably bidirectional. For example, behavioral health disorders may lead to homelessness or incarceration, and the stress of homelessness or incarceration may exacerbate behavioral health issues. Researchers, practitioners and policy-makers cannot simply assume that treating behavioral health disorders will generate social benefits; instead the benefits must be measured as programs are implemented. Examining the complex web of interactions can help practitioners address combinations of these issues with clients. Considering feedback loops embedded in these relationships can help practitioners design effective implementation strategies and design valid assessment studies.

As full implementation of the PPACA generates increased utilization of behavioral health care services, it is important to develop cost-effective strategies to ensure that patients gain maximum benefits from the resources invested to provide behavioral health care services. Projections of ballooning health care budgets indicate that it is imperative to know that an intervention does not just work well but that it will also generate the maximum possible benefit from the money that is spent (Keiling et al., 2011). Similarly, Beecham (2014) advocates additional investment in economic analyses of mental health conditions among children and adolescents (Beecham, 2014), to address both pieces of the puzzle: clinical effectiveness and economic efficiency. The results will allow individuals, providers, and policy makers to optimize patient and social outcomes that can be achieved with our health care dollars.

References

- Agency for Healthcare Research and Quality. (2012). *Experts call for integrating mental health into primary care*. Rockville, MD: Agency for Healthcare Research and Quality.
- Alonso, J., Petukhova, M., Vilagut, G., Chatterji, S., Herringa, S., Ustun, T. B., et al. (2011). Days out of role due to common physical and mental conditions: Results from the WHO World Mental Health surveys. *Molecular Psychiatry*, 16, 1234–1246.
- American Psychiatric Association. (2013). *Substance Related and Addictive Disorders*. Retrieved June 2014, from <http://www.dsm5.org/Documents/Substance%20Use%20Disorder%20Fact%20Sheet.pdf>
- Andrews, G., Sanderson, K., Corry, J., & Lapsley, H. (2004). Utilising survey data to inform public policy: Comparison of the cost-effectiveness of treatment of ten mental disorders. *British Journal of Psychiatry*, 184, 526–533.
- Beecham, J. (2014). Annual research review: Child and adolescent mental health interventions: A review of progress in economic studies across different disorders. *Journal of Child Psychology and Psychiatry*, 55(6), 714–732.
- Bernabei, R., Landi, F., Gambassi, G., Sgadari, A., Zuccala, G., Mor, V., et al. (1998). Randomised trial of impact of model of integrated care and case management for older people living in the community. *British Medical Journal*, 316(7141), 1348–1351.
- Bhui, K. S., Dinoo, S., Stansfeld, S. A., & White, P. D. (2012). A synthesis of the evidence for managing stress at work: A review of the reviews reporting on anxiety, depression, and absenteeism. *Journal of Environmental and Public Health*, 2012, 1–21.
- Bird, S. R., Kurowski, W., Dickman, G. K., & Kronborg, I. (2007). Integrated care facilitation for older patients with complex health care needs reduces hospital demand. *Australian Health Review*, 31(3), 451–461.
- Birnbaum, H. G., Kessler, R. C., Kelly, D., Ben-Hamadi, R., Joish, V. N., & Greenberg, P. E. (2010). Employer burden of mild, moderate, and severe major depressive disorder: Mental health services utilization and costs, and work performance. *Depression and Anxiety*, 27(1), 78–89.
- Blount, A., Schoenbaum, M., Kathol, R., Rollman, B. L., Thomas, M., O'Donohue, W., et al. (2007). The economics of behavioral health services in medical settings: A summary of the evidence. *Professional Psychology: Research and Practice*, 38(3), 290–297.
- Bogner, H. R., Morales, K. H., de Vries, H. F., & Cappola, A. R. (2012). Integrated management of type 2 diabetes mellitus and depression treatment to improve medication adherence: A randomized controlled trial. *Annals of Family Medicine*, 10(1), 115–122.
- Boscarino, J., Hoffman, S., Gerhard, G., Han, J., Rukstalis, M., Erlich, P., et al. (2012). Generalized Anxiety and Depression Among Chronic Pain Patients on Opioid Therapy are Associated With Higher Pain Impairment, Increased Service Utilization and Poorer Health Status. *HMORN*. 3 (August), p. 183. HMORN 2012-Selected Abstracts.
- Cauce, A. M., Paradise, M., Ginzler, J. A., Embry, L., Morgan, C. J., Lohr, Y., et al. (2000). The characteristics and mental health of homeless adolescents age and gender differences. *Journal of Emotional and Behavioral Disorders*, 8(4), 230–239.
- Centers for Disease Control and Prevention. (2013, October 4). *Mental Illness*. Retrieved June 2014, from CDC Mental Health: <http://www.cdc.gov/mentalhealth/basics/mental-illness.htm>
- Chambers, L. A., Greene, S., Watson, J., Rourke, S. B., Tucker, R., Koornstra, J., et al. (2014). Not just “a roof over your head”: The meaning of healthy housing for people living with HIV. *Housing, Theory and Society*, 31(3), 310–333.
- Chisolm, D., Kames, S., Sekar, K., Kumar, K., Murthy, S., Saeed, K., et al. (2000). Integration of mental health care into primary care Demonstration cost-outcome study in India and Pakistan. *British Journal of Psychiatry*, 176, 581–588.
- Coiro, M., Riley, A., Broitman, M., & Miranda, J. (2012). Effects on children of treating their Mothers' depression: Results of a 12-month follow-up. *Psychiatric Services*, 63(4), 357–363.

- Collins, C., Hewson, D. L., Munger, R., & Wade, T. (2010). *Evolving models of behavioral health integration in primary care*. New York, NY: The Milbank Memorial Fund.
- Connell, A. M., & Goodman, S. H. (2002). The association between psychopathology in fathers versus mothers and children's internalizing and externalizing behavior problems: A meta-analysis. *Psychological Bulletin*, 128, 746–773.
- Cornwell, K., Forbes, C., Inder, B., & Meadows, G. (2009). Mental illness and its effects on labour market outcomes. *Journal of Mental Health Policy and Economics*, 12(13), 107–118.
- Cottini, E., Kato, T., & Westergård-Nielsen, N. C. (2011). Adverse workplace conditions, high-involvement work practices and labor turnover: Evidence from Danish linked employer-employee data. *Labour Economics*, 18(6), 872–880.
- Cowell, A. J., Luo, Z., & Masuda, Y. J. (2009). Psychiatric disorders and the labor market: An analysis by disorder profiles. *Journal of Mental Health Policy and Economics*, 12(1), 3–17.
- Currie, J., & Kahn, R. (2012). Children with disabilities: Introducing the issue. *The Future of Children*, 22(1), 3–11.
- Currie, J., Stabile, M., & Jones, L. E. (2013, June). *Do Stimulant Medications Improve Educational and Behavioral Outcomes for Children with ADHD?* Retrieved July 2014, from National Bureau of Economic Research: <http://www.nber.org/papers/w19105.pdf>
- Dilsaver, S. C. (2011). An estimate of the minimum economic burden of bipolar I and II disorders in the United States: 2009. *Journal of Affective Disorders*, 129(1-3), 79–83.
- Donohue, J. M., & Pincus, H. A. (2007). Reducing the societal burden of depression: A review of economic costs, quality of care and effects of treatment. *Pharmacoeconomics*, 25(1), 7–24.
- Drake, R., Yovetich, N., Bebout, R., Harris, M., & McHugo, G. (1997). Integrated treatment for dually diagnosed adults. *Journal of Nervous and Mental Disease*, 185(5), 298–305.
- Engel, A. G., Malta, L. S., Davies, C. A., & Baker, M. M. (2011). Clinical effectiveness of using an integrated model to treat depressive symptoms in veterans affairs primary care clinics and its impact on health care utilization. *Primary Care Companion for CNS Disorders*, 13(4), 93–101.
- Falba, T. A., Sindelar, J. L., & Gallo, W. T. (2009). Work expectations, realizations, and depression in older workers. *Journal of Mental Health Policy and Economics*, 12(4), 175–186.
- Feder, A., Alonso, A., Tang, M., Liriano, W., Warner, V., Pilowsky, D., et al. (2009). Children of low-income depressed mothers: Psychiatric disorders and social adjustment. *Depression and Anxiety*, 26(6), 513–520.
- Folsom, D. P., Hawthorne, W., Lindamer, L., Gilmer, T., Bailey, A., Golshan, S., et al. (2005). Prevalence and risk factors for homelessness and utilization of mental health services among 10,340 patients with serious mental illness in a large public mental health system. *American Journal of Psychiatry*, 162(2), 370–376.
- Gadermann, A. M., Alonso, J., Vilagut, G., Zaslowsky, A. M., & Kessler, R. C. (2012). Comorbidity and disease burden in the National Comorbidity Survey Replication (NCS-R). *Depression and Anxiety*, 29(9), 797–806.
- Gershon, A., Hayward, C., Schraedley-Desmond, P., Rudolph, K. D., Booster, G. D., & Gotlib, I. H. (2011). Life stress and first onset of psychiatric disorders in daughters of depressed mothers. *Journal of Psychiatry Research*, 45(7), 855–862.
- Gilmer, T. P., Stefanic, A., Ettner, S. L., Manning, W. G., & Tsemberis, S. (2010). Effect of full-service partnerships on homelessness, use and costs of mental health services, and quality of life among adults with serious mental illness. *Archives of General Psychiatry*, 67(6), 645–652.
- Goodman, S. H. (2007). Depression in mothers. *Annual Review of Clinical Psychology*, 3, 107–135.
- Grimes, K. E., Schulz, M. F., Cohen, S. A., Mullin, B. O., Lehar, S. E., & Tien, S. (2011). Pursuing cost-effectiveness in mental health service delivery for youth with complex needs. *Journal of Mental Health Policy and Economics*, 14(2), 73–83.
- Hammen, C. (2003). Social stress and women's risk for recurrent depression. *Archives of Women and Mental Health*, 6, 9–13.

- Harrison, J. P., Satterwhite, L. F., & Ruday, W., Jr. (2010). The financial impact of post-traumatic stress disorder on returning US military personnel. *Journal of Healthcare Finance*, 36(4), 65–74.
- Hilton, M. E., Fleming, M., Glick, H., Gutman, M. A., Lu, Y., McKay, J., et al. (2003). Services integration and cost-effectiveness. *Alcoholism: Clinical and Experimental Research*, 27(2), 271–280.
- Hjortsberg, C., Helldin, L., Hjaerthag, F., & Loethgren, M. (2011). Costs for patients with psychotic illness: Differences depending upon state of remission. *The Journal of Mental Health Policy and Economics*, 14(2), 87–93.
- Kaaya, S., Eustache, E., Lapidus-Salaiz, I., Musisi, S., Psaros, C., & Wissow, L. (2013). Grand challenges: Improving HIV treatment outcomes by integrating interventions for Co-morbid mental illness. *PLoS Medicine*, 10(5), e1001447.
- Kaplan, C., & Zhang, Y. (2012). Assessing the comparative-effectiveness of antidepressants commonly prescribed for depression in the US medicare population. *Journal of Mental Health Policy and Economics*, 15(4), 171–178.
- Katon, W. J., & Unützer, J. (2013). Health reform and the affordable care act: The importance of mental health treatment to achieving the triple aim. *Journal of Psychosomatic Research*, 74(6), 533–537.
- Keiling, C., Baker-Henningham, H., Belfer, M., Conti, G., Ertem, I., Omigbodun, O., et al. (2011). Child and adolescent mental health worldwide: Evidence for action. *The Lancet*, 378(9801), 1515–1525.
- Kessler, R. C., Avenevoli, S., Costello, E. J., Georgiades, K., Green, J. G., Gruber, M. J., et al. (2012). Prevalence, persistence, and sociodemographic correlates of DSM-IV disorders in the national Comorbidity survey replication adolescent supplement. *Archives of General Psychiatry*, 69(4), 372–380.
- Kessler, R. C., Chiu, W. T., Demler, O., & Walters, E. E. (2005). Prevalence, severity, and comorbidity of 12-month DSM-IV disorders in the National Comorbidity Survey Replication. *Archives of General Psychiatry*, 62(6), 617–627.
- Knapp, M., King, D., Healey, A., & Thomas, C. (2011). Economic outcomes in adulthood and their associations with antisocial conduct, attention deficit and anxiety problems in childhood. *Journal of Mental Health Policy and Economics*, 14(3), 137–147.
- Kotsopoulos, N., Connelly, M. P., Sobanski, E., & Postma, M. J. (2013). The fiscal consequences of ADHD in Germany: A quantitative analysis based on differences in educational attainment and lifetime earnings. *Journal of Mental Health Policy and Economics*, 16(1), 27–33.
- Lamb, H. R., & Weinberger, L. E. (2005). The shift of psychiatric inpatient care from hospitals to jails and prisons. *Journal of the American Academy of Psychiatry and the Law*, 33(4), 529–534.
- Lépine, J.-P., & Briley, M. (2011). The increasing burden of depression. *Neuropsychiatric Disease and Treatment*, 7(Suppl 1), 3–7.
- Lo Sasso, A. T., Rost, K., & Beck, A. (2006). Modeling the impact of enhanced depression treatment on workplace functioning and costs. *Medical Care*, 44, 352–358.
- MacAdam, M. (2008). *Frameworks of integrated care for the elderly: A systematic review*. Ontario, CA: Canadian Policy Research Networks.
- McCrone, P., Knapp, M., Proudfoot, J., Ryden, C., Cavanagh, K., Shapiro, D. A., et al. (2004). Cost-effectiveness of computerised cognitive-behavioural therapy for anxiety and depression in primary care: Randomised controlled trial. *British Journal of Psychiatry*, 185, 55–62.
- Miller, K. M., Orellana, E. R., Briggs, H. E., & Quinn, A. (2014). Influence of caregiver substance dependence and serious mental illness on Children's mental health: Moderating effects of social support. *Child and Adolescent Social Work Journal*, 1–20.
- Nelson, R. E., & Kim, J. (2011). The impact of mental illness on the risk of employment termination. *Journal of Mental Health Policy and Economics*, 14(1), 39–52.
- Parthasarathy, S., & Weisner, C. M. (2005). Five-year trajectories of health care utilization and cost in a drug and alcohol treatment sample. *Drug and Alcohol Dependence*, 80(2), 231–240.

- Patient-Centered Outcomes Research Institute. (2014, April). *FAQs for Applicants*. Retrieved from Patient-Centered Outcomes Research Institute: <http://www.pcori.org/funding-opportunities/funding-center/faqs-for-applicants/>
- Pecora, P., Williams, J., Kessler, R. C., Downs, C. A., O'Brien, K., Hiripi, E., et al. (2003). *Assessing the effects of foster care: Early results from the Casey National Alumni Study. The Foster Care Alumni Studies*. Casey Family Programs.
- Peterson, I., Lund, C., Bhana, A., & Flisher, A. J. (2012). A task shifting approach to primary mental health care for adults in South Africa: Human resource requirements and costs for rural settings. *Health Policy and Planning*, 27(1), 42–51.
- Prince, M., Patel, V., Saxena, S., Maj, M., Maselko, J., Phillips, M. R., et al. (2007). No health without mental health. *The Lancet*, 370(9590), 859–877.
- Prins, S. J. (2011). Does transinstitutionalization explain the overrepresentation of people with serious mental illnesses in the criminal justice system? *Community Mental Health Journal*, 47(6), 716–722.
- Rothbard, A. B., Metraux, S., & Blank, M. B. (2009). Cost of care for medicaid recipients with serious mental illness and HIV infection or AIDS. *Psychiatric Services*, 54(9), 1240–1246.
- Sawyer, L., Azorin, J.-M., Chang, S., Rinciog, C., Guiraud-Diawara, A., Marre, C., et al. (2014). Cost-effectiveness of asenapine in the treatment of bipolar I disorder patients with mixed episodes. *Journal of Medical Economics*, 17(7), 508–519.
- Shirk, C. (2008). *Medicaid and mental health services*. National Health Policy Forum. George Washington University.
- Simon, G. E., Katon, W. J., Lin, E. H., Rutter, C., Manning, W. G., Von Korff, M., et al. (2007). Cost-effectiveness of systematic depression treatment among people with diabetes mellitus. *JAMA Psychiatry*, 64(1), 65–72.
- Simon, G. E., Katon, W. J., VonKorff, M., Unutzer, J., Lin, E. H., Walker, E. A., et al. (2001). Cost-effectiveness of a collaborative care program for primary care patients with persistent depression. *American Journal of Psychiatry*, 158(10), 1638–1644.
- Snedecor, S. J., Botteman, M. F., Schaefer, K., Sarocco, P., Barry, N., & Pickard, A. S. (2010). Economic outcomes of eszopiclone treatment in insomnia and comorbid major depressive disorder. *The Journal of Mental Health Policy and Economics*, 13(1), 27–35.
- Soni, A. (2012). *Trends in use and expenditures for depression among U.S. adults age 18 and older, civilian noninstitutionalized population, 1999 and 2009*. Rockville, MD: Agency for Healthcare Research and Quality, Medical Expenditure Panel Survey.
- Stensland, M. D. (2010). Costs associated with attempted suicide among individuals with bipolar disorder. *Journal of Mental Health Policy and Economics*, 13(2), 87–92.
- Substance Abuse and Mental Health Services Administration. (2012). *Mental health, United States, 2010*. Rockville, MD: Substance Abuse and Mental Health Services Administration, HHS.
- Substance Abuse and Mental Health Services Administration. (2013). A Standard Framework for Levels of Integrated Healthcare. *SAMHSA-HRSA*.
- Substance Abuse and Mental Health Services Administration. (2013). *Behavioral Health Barometer: United States, 2013*. Retrieved July 2014, from Substance Abuse and Mental Health Services Administration: <http://store.samhsa.gov/shin/content/SMA13-4796/SMA13-4796National.pdf>
- Substance Abuse and Mental Health Services Administration. (2013c). *Behavioral health, United States, 2012*. Rockville, MD: Substance Abuse and Mental Health Services Administration, HHS.
- Swanson, J. W., Frisman, L. K., Robertson, A. G., Lin, H.-J., Trestman, R. L., Shelton, D. A., et al. (2013). Costs of criminal justice involvement among persons with serious mental illness in Connecticut. *Psychiatric Services*, 64(7), 630–637.
- Travis, J. (2005). Families and children of offenders who return home. *Federal Probation Journal*, 69, 31.
- Trupin, E., Walker, S. C., Burden, H., & Roberts, M. H. (2013). Court diversion for juveniles with mental health disorders. *Virtual Mentor*, 15(10), 866–872.

- Unützer, J., Schoenbaum, M., Katon, W. J., Fan, M.-Y., Pincus, H. A., Hogan, D., et al. (2009). Healthcare costs associated with depression in medically ill Fee-for-service medicare participants. *Journal of the American Geriatrics Society*, 57(3), 506–510.
- Vick, B., Jones, K., & Mitra, S. (2012). Poverty and severe psychiatric disorder in the U.S.: Evidence from the medical expenditure panel survey. *Journal of Mental Health Policy and Economics*, 15(2), 83–96.
- VonKorff, M., Katon, W. J., Lin, W. H., Ciechanowski, P., Peterson, D., Ludman, E. J., et al. (2011). Functional outcomes of multi-condition collaborative care and successful ageing: Results of randomised trial. *British Medical Journal*, 343, d6612.
- Wang, P. S., Patrick, A., Avorn, J., Azocar, F., Ludman, E., McCulloch, J., et al. (2006). The costs and benefits of enhanced depression care to employers. *Archives of General Psychiatry*, 63(1345-1353).
- Warner, V., Weissman, M. M., Fendrich, M., Wickramaratne, P., & Moreau, P. (1992). The course of major depression in the offspring of depressed parents. Incidence, recurrence, and recovery. *Archives of General Psychiatry*, 49(10), 795–801.
- Weissman, M. M., Bland, R. C., Canino, G. J., Faravelli, C., Greenwald, S., Hwu, H.-G., et al. (1996). Cross-national epidemiology of major depression and bipolar disorder. *JAMA*, 276(4), 293–299.
- White, C. R., O'Brien, K., Pecora, P. J., English, D., Williams, J. R., & Phillips, C. M. (2009). Depression among alumni of foster care: Decreasing rates through improvement of experiences in care. *Journal of Emotional and Behavioral Disorders*, 17(1), 38–48.
- Wiley-Exley, E., Domino, M. E., Maxwell, J., & Levkoff, S. E. (2009). Cost-effectiveness of integrated care for elderly depressed patients in the PRISM-E study. *Journal of Mental Health Policy and Economics*, 12(4), 205–213.
- World Health Organization. (2001). *Mental health: A call for action by world health ministers* (Ministerial Round Tables 2001, 54th World Health Assembly). Geneva: World Health Organization.
- World Health Organization. (2008). *Integrating mental health care into primary care*. Geneva: World Health Organization.

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