Mental health

Book section

Chapter 2

Mental Health

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Mental health issues can emerge at any age, with incidence particularly common in childhood and young adulthood. The personal and economic consequences can last the life-course, and spillover into family and wider community impacts. Mental health issues are among the most challenging of all illnesses because of the breadth, durability and complexity of impact.

We describe prevalence, mortality and disability, and discuss challenges arising in the mental health field, each with economic implications. We discuss issues that arise in financing mental health interventions, and report expenditure levels. Numerous methodological and practical challenges arise when conducting economic evaluation in the mental health field. We describe how evidence from cost-effectiveness and other analyses contribute to better resource utilization decisions.

Throughout the chapter we argue how most mental health problems are complicated, and have many negative and often distressing consequences for the individuals who are unwell, their families, and the wider society. This complexity often makes them expensive, and the durability and wide sphere of impact add to the economic consequences. Given the pervasive scarcity of resources, decision-makers must think through the economic case for strategies or treatments that might address mental health needs.

1. Introduction

Mental health issues can emerge at any age, but are particularly likely to become problematic between childhood and young adulthood. They often have highly significant consequences across much of the life-

course, not only for the individual, but also for their family and the wider community. Indeed, mental health issues are among the most challenging of all health problems because of the breadth, durability and indeed complexity of their impacts.

The effects of poor mental health may start even before life begins: maternal mental illness during pregnancy or in the immediate period after giving birth can negatively affect a child's later emotional, behavioral and intellectual development. Emotional and behavioral problems that develop in childhood often continue into adolescence and can lead to difficulties that stretch long into adulthood. Similarly, because the most common age of onset of psychoses such as schizophrenia and bipolar disorder is in late adolescence and early adulthood, the longer-term consequences of these usually very serious illnesses can be especially marked over much of adult life because so many key investments and decisions are made in the teenage years that shape future careers, personal relationships and social roles. But mental health problems can also emerge later in life, as a result of traumatic experiences, major losses such as bereavement, stresses in the workplace, strained inter-personal relationships, or economic difficulties such as sudden unemployment or unsecured debt. And one of the most challenging of mental health problems is dementia, which in the vast majority of cases does not develop until old age.

We return to some of these topics later – the breadth and durability of impacts, for example – and also discuss associations that may indicate adverse influences that run in the opposite direction. For example, people with mental health problems are more likely to smoke, be overweight, have disrupted education, be unemployed, take time off work for health reasons, fall into poverty, or find themselves in the criminal justice system. It has been shown repeatedly that major mental disorders are associated with premature mortality, and there is of course the link between some mental illnesses, self-harm and suicide.

In the next section of the chapter we provide introductory information on mental illness, including prevalence, mortality and disability. In section 3 we discuss a series of challenges that arise in the mental health field: for policy formulation, for healthcare and related practice, and for research to support decisions in these areas. We discuss a series of

'economic opportunities and challenges'. Between them, they reflect the key characteristics of mental illness: distressing and disabling symptoms that are often chronic if untreated; high rates of comorbidity with other mental health issues and a range of chronic physical health problems; effects on many aspects of individuals' lives, with consequences for a range of public and private budgets; spillover effects on other people, especially family members but also in the wider community; disrupted employment and work-related difficulties; associations with antisocial behavior, substance misuse and crime; links to self-harm and suicide; widespread stigma, discrimination and victimization; and strong associations with socioeconomic disadvantage and inequalities.

In section 4, we discuss how mental health interventions might be financed. Other chapters in this book have already discussed health financing (for example, see chapter XX) and we do not attempt comprehensive coverage of the topic; rather, we consider the particular issues that arise in the mental health field. We also describe evidence on levels of expenditure on mental health interventions.

We then turn to economic evaluation in section 5, and the methodological questions and practical tasks that arise in the mental health field, particularly those stemming from the challenges in section 3. We discuss how economic arguments can support the case for prevention and treatment by describing how evidence from cost-effectiveness and other analyses contributes to better decisions about resource use. In the final section we make some concluding comments, highlighting the main public policy themes that emerge from our examination of the mental health area.

2. Prevalence, Mortality, Disability

2.1. *Prevalence*

Mental health problems can be categorized in a number of ways, but the distinction is often made between common mental disorders and more severe mental disorders. The former include illnesses such as depression, generalized anxiety disorder, panic disorder, obsessive-compulsive

disorder and post-traumatic stress disorder. The prevalence of common mental disorders varies slightly between countries, but is in the range 15% to 20% of the adult population.[1,2] So-called severe or serious mental health problems – although, of course, many people with depression and some anxiety disorders would periodically be experiencing serious impairment and distress – include schizophrenia and bipolar disorder (sometimes still referred to as 'manic depression'). The combined prevalence of these severe mental disorders is between 2% and 3%, although again there can be (small) inter-country differences.

Other conditions included within the set of disorders conventionally seen as mental illnesses are alcohol and drug (substance) abuse, suicide and suicidal ideation. The World Health Organization (WHO) additionally includes epilepsy as a mental disorder for the purposes of its monitoring and advisory activities, although this is not a universally accepted convention and we will not discuss epilepsy further in this chapter. We will also say little about developmental disorders such as intellectual disabilities, although many people with these disorders will have comorbid depression or anxiety, and also a greater likelihood of developing dementia.

The classification of mental illnesses is different in childhood, in part because of the difficulty of making a diagnosis and in part because some disorders tend not to emerge until adolescence or early adulthood. Approximately 6% of children and young people aged under 18 years have behavioral problems adjudged serious enough to be classified as psychiatric disorders.[3] About 4% of children and young people have emotional disorders, but again it is not always straightforward to decide when the problems experienced are 'serious enough' to warrant psychiatric diagnosis. This is obviously not a trivial matter, since diagnosis can be stigmatizing. But it is often the gateway to treatment, and in some countries may trigger family eligibility for free services or income supplements.

In old age new mental health problems may emerge, in particular the various conditions grouped under the umbrella term 'dementia', the most common being Alzheimer's disease. Dementia prevalence has a steep gradient with age: between 1% and 2% for people aged 65-69 years, but 22% for men and 30% for women for those aged 90 and above.[4]

Dementia is however not exclusively a problem of old age, since younger adults can develop this devastating disease, although prevalence is very low before age 60. Much policy and public attention is now being focused on dementia because the world's population is aging rapidly, so that there are considerably more people with dementia today than ever before, and the number globally will almost double by 2030.[5] There is currently no cure for any of the dementias. Even though there have been indications recently that the age-specific prevalence rate might be slowing slightly,[6,7] the total number of people with dementia worldwide will still grow rapidly over coming decades unless a disease-modifying treatment is found.

2.2. *Disability*

The consequences of any health problem can be assessed in a number of ways, most obviously by describing the symptoms, the impacts on an individual's ability to lead a 'normal' life (in terms of independence and employment, for instance), and the associated deterioration in quality of life. Symptoms are illness-specific and this makes it hard to make comparisons or conduct aggregations across different illnesses, and so generic metrics for comparison and aggregation have been suggested for disability, health-related quality of life and cost.

The most recent iteration of global burden of disease calculations – couched in disability terms – has been generated by the *Global Burden of Diseases, Injuries, and Risk Factors Study 2010*, and includes figures for twenty mental and substance use disorders.[8] Figures for each disorder are reported in terms of years of life lost to premature mortality (YLLs), years lived with disability (YLDs), and disability-adjusted life years (DALYs), which are the sum of YLDs and YLLs. Estimates are adjusted for comorbidity.

Globally in 2010, and aggregated over all mental and substance use disorders, the total impact was 184 million DALYs, equivalent to 7·4% of the total burden of disease (i.e. DALYs for all health problems worldwide). Most of this burden came from years lived with disability (175 million YLDs) – equivalent to 23% of the overall total, and the leading cause of YLDs worldwide – rather than mortality (9 million

YLLs; less than 1% of the overall total). Within the total for mental and substance use disorders, depressive disorders made the single largest contribution (41% of DALYs associated with these disorders). The next largest contributors were: anxiety disorders (15%), illicit drug use disorders (11%), alcohol use disorders (10%), schizophrenia (7%), bipolar disorder (7%), pervasive developmental disorders (mainly autism, 4%), childhood behavioral disorders (3%) and eating disorders (1%). The burden associated with mental and substance use disorders has grown considerably over time: an increase of 38% between 1990 and 2010, mostly driven by population growth and ageing, rather than changes in age-specific prevalence rates.[8] Both total and proportional burdens are expected to continue to grow over coming decades, particularly in low- and middle-income countries (LAMICs).

One of the important conclusions to draw from this work – and from similar work conducted on a smaller scale in individual countries – is that the personal and societal impacts of mental health problems cannot be adequately gauged from their effects on mortality, but need to be understood mainly in terms of their deleterious effects on quality of life (broadly interpreted).

This high disease burden obviously follows from the high prevalence and chronic nature of most mental disorders, given that few can currently be cured. Not surprisingly, there are also high associated costs (as we describe in section 3.3 below). But there are also wide gaps between the underlying prevalence and the rate of diagnosis and treatment, especially in LAMICs. A few years ago the World Health Organization estimated that the proportion of people with serious mental illness who had received no treatment in the previous 12 months was between 76% and 85% in the LAMICs they looked at.[9] But even in high-income countries, the proportion not being treated was generally between 35% and 50%. An initiative led by WHO, with buy-in from international donors and clinical and academic communities – the Mental Health Gap Action Program (mhGAP) – is actively encouraging strategic policy-makers across the world to address this major problem of untreated morbidity.

3. Challenges Associated with Mental Illness

The inherent characteristics of most mental illnesses – many of which would be seen as quite complicated and challenging – have a range of direct and indirect economic implications.

3.1. *Enduring Impacts*

Effective treatment of mental health problems will often considerably reduce or perhaps completely remove symptoms. However, chronicity of the underlying condition remains the usual pattern of illness, and given that incidence is often in the formative years of childhood or adolescence, the adverse consequences will often extend long into adult life. Moreover, as noted above, quite high proportions of people with mental health problems do not have their symptoms recognized or adequately treated. The effects of this neglect could obviously include poor health-related quality of life for those individuals, but also antisocial and criminal behavior and substance misuse (often associated with behavioral problems in childhood and perhaps with psychosis), unemployment, poor workplace experiences (and hence absenteeism and presenteeism), poverty and social exclusion.

Each of these consequences could generate high costs over extended periods. For example, Scott et al[10] looked at follow-up data on a sample of 28-year olds whose behavioral and emotional needs (and many other characteristics) had been studied at age 10. For this London (UK) sample, conduct disorder in childhood (a psychiatric diagnosis; found for the most antisocial 3% of the children in the study) and conduct problems (found for the next 9%) were predictive of considerably higher service-related costs between ages 10 and 28, particularly costs of criminal justice contacts. Costs for the conduct disorder group were almost ten times higher than those for the group with no mental health problems. Child and adolescent mental health services in the UK in the early 1970s – when this sample were first studied – were under-developed and under-resourced, and so these huge cost differences in early adulthood probably represent what happens when childhood behavioral problems go untreated.

Another London cohort study, which started collecting data on a group of boys a decade later than the group included in the Scott et al study, also found that conduct problems and hyperactivity at age 6-7 years were associated with high service-related costs (again, especially criminal justice costs) twenty years later, but the difference compared to boys without mental health problems was smaller.[11] Given these time trajectories there is clearly the potential for good and timely treatment to confer positive health and economic benefits over many years too.[12]

Childhood mental health problems also commonly lead to employment difficulties in adulthood. Goodman et al[13] used birth cohort data for over 17,000 children born in Britain in one week in 1958 to show large effects on earnings, labor supply and other sources of family income by age 50 associated with childhood psychological problems. Adulthood economic cost related to childhood mental disorders was much greater than the cost related to physical illnesses: the impacts of poor mental health appeared to occur earlier in adulthood compared to the poor physical health. Broadly similar findings emerged from another British birth cohort: conduct disorder, attention deficit hyperactivity disorder and anxiety problems at age 10 were all associated with worse employment-related outcomes at age 30. But there was one important exception: boys with conduct disorder in childhood had significantly *higher* earnings than boys without conduct disorder, even after adjusting for all relevant covariates.[14]

A long-term American follow-up study charted the impacts of childhood psychological conditions including depression and substance abuse up to 40 years later using data from the US Panel Study of Income Dynamics (PSID).[15] The authors followed groups of siblings and their parents in an attempt to adjust for some of the covariates that compromise this kind of research; they also adjusted for physical health in childhood. Childhood psychological problems were strongly predictive of poorer educational accomplishments, worse employment patterns, lower family household income and assets, and a lower probability of being married.

Buescher et al[16] calculated the annual and lifetime costs of autism spectrum disorders (ASD), covering healthcare, education, social care, special housing, community services, social security benefits, and lost

employment (productivity losses) for individuals with ASD and their families. They compared these costs between the UK and USA, finding that the lifetime cost of supporting someone with an ASD who also has intellectual disability (IQ below 70) was $2.4 million in the US and £1.5 million ($2.2 million) in the UK. For someone with an ASD but without intellectual disability (e.g. with Asperger's Syndrome) these lifetime costs were $1.4 million (US) and £0.92 million (UK; $1.4 million). The similarities in total costs between the two countries were quite striking, although underlying patterns of service support differ.

As noted earlier, the most common age of onset of psychosis is adolescence or early adulthood, which can therefore seriously disrupt education and post-school training, leading to poor educational outcomes and poor longer-term employment prospects. The longer the duration of untreated psychosis the worse the health and other outcomes for individuals, including a higher risk of suicide. One systematic review found a completed suicide rate of about 4% in people with schizophrenia, with most of these events occurring early in the course of the illness.[17] Healthcare systems in some high-income countries have invested in early intervention services designed to provide intensive multifaceted support for young people experiencing a first psychotic episode; these services can reduce suicide rates.[18] More generally, they can reduce symptomatic relapse and improve vocational recovery and quality of life,[19] and can substantially reduce short- and long-term health, social care and other service-related costs.[20]

3.2. *Comorbidities*

Two major comorbidity 'themes' are becoming more widely appreciated in this area. One is the high risk of physical morbidity and premature mortality among people with enduring mental health problems, in part linked to the risks that follow from poor health behaviors. The other is the high rate of psychiatric morbidity in people with long-term physical health conditions such as cancer, coronary heart disease and diabetes. In both cases, the comorbidities might considerably impair health and quality of life – the overall impact often being greater

than the sum of the parts – which then complicates treatment and adds significantly to healthcare costs.

Mental and physical health problems often cluster together in childhood, for instance, leading to higher service-related costs.[21,22] People with schizophrenia have above-average rates of physical morbidity (particularly cardiovascular disease and type 2 diabetes) and lower life expectancy: up to 20 years lower compared with the general population.[23] Indeed, while public health programs have achieved successes in some high-profile areas over recent decades, the relative disadvantage experienced by people with severe mental health problems appears to have widened: a Swedish study found that while deaths from heart disease had decreased in the general population, they *increased* for people with schizophrenia.[24] Tobacco use is especially high among people with psychosis[25] and is above average for people with most mental illnesses,[26] with obvious longer-term health consequences. Treatments might actually exacerbate the situation: some antipsychotic medications are known to cause rapid weight gain and metabolic complications.[27]

Depression is frequently associated with poor physical health, with diabetes being very common for example, generating difficulties in terms of self-management of health and increasing the likelihood of absenteeism from work.[28] A calculation for the US suggested that healthcare costs for individuals with severe depression and diabetes are almost twice those for people with diabetes alone.[29] The broader economic consequences are also considerable.[30] However, 'collaborative care' approaches delivered in primary care settings – antidepressant medications, perhaps psychological therapy, and usually with nurse-led case management – have been shown to improve health and to be cost-effective.[31,32] Comorbidity seems to be the rule rather than the exception, and the area of diabetes and depression is one of the few that has been researched and for which interventions have been developed. More attention is now being paid to innovative forms of liaison psychiatry, and the re-designing of payment mechanisms to encourage better integrated working across specialties.

Naylor et al[33] conservatively estimated that £1 in every £8 of healthcare expenditure in England on people with long-term (physical)

conditions is linked to their (often untreated) poor mental health. The increase in total healthcare costs was at least 45% for each person with both a long-term condition and a comorbid mental health problem. This evidence review also pointed to complicated patterns of association with other factors: people with comorbid physical and mental health problems were more likely to be living in deprived areas and to have poorer access to economic, social and healthcare resources. Associations with inequalities were particularly marked.

One more example can be offered: the interconnections between HIV and mental illness. Two evidence reviews highlight the prevalence of this comorbidity, and the scale of the challenge in Africa. Breuer et al[34] show how complex this bi-directional interconnection can be, with reported prevalence rates of mental illness among people living with HIV or AIDS being as high as 19% in one study. Brandt[35] concluded that 'about half of HIV-infected adults sampled had some form of psychiatric disorder, with depression the most common individual problem,' considerably higher than for equivalent people *not* infected with HIV. Antiretroviral treatment was associated with lower rates of psychiatric morbidity. A cohort study in Malawi found that HIV-infected women do not have higher rates of postpartum depression than uninfected women, but depression was higher among women with an HIV-infected child.[36]

3.3. *Multiple Needs and Impacts*

Mental health problems that are unrecognized, poorly managed or unresponsive to treatment can have enduring and considerable impacts across many life domains. In turn, there could be needs for intervention from many service or policy sectors, such as social care, housing, employment, criminal justice, income support and other systems. Consequently, although the direct healthcare treatment costs will often be substantial – mental health needs account for more than 10% of total health budgets in many high-income countries, for example – the indirect costs can high too.

We discuss employment-related impacts and criminal justice impacts in later sub-sections, but note here that both make substantial

contributions to overall costs for many people with mental health problems.

Partly because of the employment difficulties that many individuals with mental health issues face – either in getting a job in the first place, or keeping it, or being able to work full-time – they would benefit from welfare advice, and many are reliant on social security (welfare) payments. Some are caught in a vicious downward spiral: their mental health problems damage their employment prospects and plunge them into poverty, the stress of which then exacerbates the underlying symptoms. The combined effects of severe and enduring mental illness and persistent poverty can lead to situations where individuals are socially isolated and not able to access appropriate services. Specialist advice around welfare entitlements, debt management and community resources can be cost-effective.[37,38]

Another substantial impact of mental health problems outside the healthcare sector is in the domain of housing. Social and economic disadvantage can generate housing problems. Homelessness is common for people with schizophrenia and other psychotic disorders.[39] Again there is a vicious circle of mental health problems leading to economic disadvantage, leading in turn to an inability to keep up rental or mortgage payments, which causes more stress and symptomatic relapse. To take just one illustration, patients discharged from psychiatric inpatient settings may relapse if they are not able to move into sufficiently supportive community environments.[40] Homelessness is itself socially costly, and providing supported housing is also going to need injection of resources from public or charitable sources. Supported housing programs can be effective in improving quality of life and health[41] and cost-effective in reducing use of emergency room and outpatient services.[41,42] These successful interventions involve well-coordinated actions across health, housing and other relevant sectors, including help with managing social security benefits and paying bills.

Indeed, a common theme that emerges from much of the evaluative research on interventions in the mental health field is this need for *coordinated action* across sectors, systems and budgets. This helps to avoid gaps through which individuals with complex needs might fall, thereby reducing the occurrence of distressing and costly crises. But a

perennial challenge is 'silo-budgeting', where budget-holders are so focused on protecting their own resources and carefully managing their own spending that they shift costs and dump problems onto other budgets. Silo-budgeting is probably more likely in periods when resources are under particular pressure, such as during macroeconomic recession, and yet that is precisely the time when coordinated action is most needed.

Taking a bird's-eye view of these multiple needs and their consequences, we can see from a number of cost-of-illness and similar studies how non-healthcare costs can stack up relative to healthcare costs. Charrier et al,[43] for example, reviewed evidence on the cost of schizophrenia in OECD countries, finding substantial productivity losses, high costs to unpaid family carers, and wide-ranging impacts on other service systems. High non-healthcare costs associated with schizophrenia have also been documented in countries such as Japan,[44] China[45] and Thailand.[46] For bipolar disorder, a systematic review found many studies where the non-healthcare costs dominated health costs,[47] and this pattern is even more marked when looking at depression[48] and anxiety disorders.[49] Indeed, one English study calculated that 90% of the societal cost of depression was due to unemployment and absenteeism from work.[50] In childhood, there can be high-cost impacts in the education system: childhood mental health problems in Britain generated costs for frontline education services twelve times greater than costs for specialty mental health services.[51]

Looking to the future, calculations by Bloom et al[52] compared expected costs for mental health problems with those for the four non-communicable diseases focused on by a United Nations High-Level Meeting in 2011. (To widespread surprise, the UN excluded mental illness from its list of non-communicable diseases.) Bloom found that total lost output from mental health problems over the following 20 years was (on an annual basis) equivalent to about 5% of global GDP in 2010. This impact was greater than that of cardiovascular diseases, and vastly greater than diabetes, chronic respiratory diseases and cancer.

3.4. *Impacts on Others*

There are numerous 'spillover' or 'external' effects of mental health problems on other people, both contemporaneously and over time. Three areas illustrate well these often wide-ranging impacts: maternal mental illness during the perinatal period, family impacts in schizophrenia, and consequences for health, time and quality of life for unpaid carers of people with dementia. There are also ways in which actions by external parties can have important benefits for people experiencing mental illness.

Perinatal mental health problems can have deleterious consequences for the newly born children as they develop through childhood and adolescence (and also on the mother's partner and other children). There are high risks that the child will have emotional, behavioral or intellectual problems,[53-56] and also of intergenerational transmission of socio-economic disadvantage.[57] Bauer et al[58] examined the effects and associated costs of perinatal maternal depression on child development up to age 16 years from a London cohort study. The additional risks that children exposed to perinatal depression would develop emotional, behavioral or cognitive problems ranged from 5% to 21%, and there was a likelihood of 24% of having special educational needs. Discounting costs back to the time of birth, each child exposed to perinatal depression generated public sector costs of £3,030, reduced earnings of £1,400 and health-related quality of life losses valued at £3,760, after adjusting for other covariates. Interventions designed to recognize and treat mental health problems in women during pregnancy or soon after birth, which might already look encouraging in terms of their impacts on mothers and cost-effective,[59] might therefore be *further* justified by reference to effects on their offspring. Thus far, however, these wider effects have not been included in evaluative studies.

As with other mental illnesses, the distressing and disabling experiences of people with schizophrenia can have impacts on family members.[60] If a psychotic episode leads to violence, which can sometimes happen (see section 3.6), then there could be wider external impacts. Families with a member with schizophrenia may incur direct or indirect costs themselves, such as out-of-pocket payments for services or

to transport the person with schizophrenia to treatment, or lost earnings if they give up employment or take time off work to provide support. These are largely hidden costs, but they are of importance if a mental health system is heavily reliant on the unpaid inputs of family and other carers. On the other hand, high levels of 'expressed emotion' within a family – high levels of criticism, hostility, emotional over-involvement and over-exuberant praise – have been known to exacerbate psychotic symptoms. Family-focused therapy can be quite effective in some cases[61] and also potentially cost-effective.[62]

In the dementia area, reliance on unpaid care inputs from spouses and family members is enormous across every country.[63] Responsibility for caring can take its toll on the health and wellbeing of unpaid carers, with high rates of depression and anxiety, for example.[64] With the right kinds of support, these 'burdens' can often be lessened, and in ways that are cost-effective. A sample of family carers of people with dementia in the UK were given information on where to get emotional support, and taught (personalized) techniques to improve their understanding and manage the behaviors of the person they cared for, change unhelpful thoughts, promote acceptance, improve communication, plan for the future, relax and engage in meaningful enjoyable activities. Compared to standard support arrangements, this intervention significantly improved carer health-related quality of life and mental health over a 24-month period, had no effects (negative or positive) on illness severity, neuropsychiatric symptoms or quality of life for the people with dementia, and was no more costly than.[65,66]

3.5. *Employment*

The OECD compiled an excellent, wide-ranging report on the links between mental health and work.[67] One of its central messages is that the links between mental illness and employment difficulties are many and complex. People with established disorders face greater risks of unemployment and job insecurity, higher rates of absenteeism and presenteeism, lower earnings, and a greater likelihood of early retirement.[68,69]

Another part of this complex set of interconnections is the modal age for incidence of psychotic illnesses (in late adolescence and early adulthood), which can seriously compromise individuals' abilities to build human capital through education and training, and thereby damage their life-long economic potential. Indeed, across a range of psychiatric diagnoses, individuals with disorders have above-average propensities to leave education early.[67] Employment is the main source of household income for most people, but also influences social status and roles, fosters social participation, and is a source of self-concept. Long-term employment difficulties increase the risk of unmanageable personal debt and poverty, in turn further worsening mental health.[70] For the wider society, employment affects community prosperity and national economic growth.

The links between mental illness and employment become especially difficult when an economy is under pressure. A study that looked at the 27 European Union countries demonstrated that people with mental health problems found it harder to get employment during the global macroeconomic recession of recent years than people without such morbidity. Moreover, the relative disadvantage was significantly greater in countries which displayed higher levels of stigmatizing attitudes towards mental illness.[71]

One response to the danger of a damaging, costly downward spiral linking poor mental health and poor employment experiences and outcomes has been to try to create better employment opportunities for people with a history of mental illness, breaking down discriminatory and attitudinal barriers. There is evidence from many countries that supported employment approaches – intensive skilled support both for employees with mental disorders and their employers in 'open employment' settings – are more effective and cost-effective than traditional approaches centered around 'sheltered workshops'. The best known is Individual Placement and Support (IPS) which helps individuals obtain competitive employment as quickly as possible and then provides on-the-job training and support from employment specialists who are usually integrated into clinical teams, with welfare benefits counselling provided through the transition phase into employment. When implemented properly, IPS is cost-effective

compared to traditional vocational support approaches.[72] The six-country EQOLISE study conducted in Europe, for instance, found both lower costs and better employment outcomes for IPS.[73]

There are characteristics of workplaces that can cause mental health problems to emerge or worsen, such as stress and bullying. Consequently, another response to the employment challenge has been legislation that clarifies and protects rights to employment and to encourage mental disorders to be viewed in the same way as other conditions and disabilities. Most people with mental health problems want to work and can do so when well, deriving therapeutic as well as economic benefits from it, but can become disillusioned and disengaged if their aspirations are repeatedly dashed.

From the perspective of the employer, there are two big issues. One is that someone with a history of mental illness may be perceived to be less productive than someone without such a background. Many individuals therefore choose not to disclose their health histories when seeking employment.[74] Productivity losses that could result if a key employee takes time off work for short or long periods could be tackled by taking appropriate preventive or ameliorative action in the workplace. While not all risk factors for mental disorders are within an employer's control, some of them undoubtedly are, such as the demands made on employees, the opportunities for them to participate in decision-making, prospects for promotion, workplace harassment, and bullying.

Workplace well-being programs and screening for stress can be highly cost-effective, both for the employer and the broader society.[75,76,38] Among the measures that employers can take to make it easier for individuals with a history of, or currently experiencing mental health problems to remain in work and to remain productive are adjustments to the workplace, such as flexible scheduling or quieter or less stressful working environments, allowing people to work from home, and training managers in better mental health awareness, whilst also helping employees to build up resilience. A number of these workplace-based interventions have been shown to be cost-effective.[77]

3.6. *Antisocial Behavior and Crime*

There is a widely held view that people who experience or have a history of mental illness are unpredictable and perhaps violent, a view reinforced by inaccurate and irresponsible reporting in some parts of the media. Thornicroft et al[78] analyzed newspaper reporting of mental health topics by British newspapers, finding that 14% made explicit reference to people with mental health problems being a danger to others and/or using stigmatizing language.

Although the risks are often exaggerated, it is nevertheless correct that some mental illnesses are associated with a greater likelihood of antisocial behavior or crime. We have already alluded to findings that many children with conduct disorder or displaying antisocial behavior will often – without adequate treatment – become adolescent delinquents and adult criminals.[79] Substance abuse can trigger acquisitive crime, with high costs for the criminal justice system and victims.[80] It is also known that, for example, 5% of serious violent crime in England and Wales is committed by individuals under the care of specialist mental health services,[81] and that a disproportionate number of homicides in Australia are committed by people experiencing their first florid symptoms of psychosis.[82] A study in the USA found that the risk of violence was highest among individuals with alcohol disorders (25%) and drug disorders (35%), much more than the risk among people with schizophrenia (13%).[83] Not surprisingly, risks are higher for those individuals who are not adhering to their treatment plans.[84] Again, the economic consequences can be large.

Societal responses to these patterns can be both inappropriate and appropriate: stigmatizing and punishing, or constructively responding to needs by offering evidence-based treatment and support. Epidemiological surveys have shown that high proportions of people in prison have previously unrecognized and therefore untreated mental disorders.[85] Poor access to mental health services can propel people in the wrong direction: one US study found that when inpatient psychiatric beds availability fell, there was an increase in the risk of imprisonment for minor charges among people with severe mental health problems, linked particularly to substance abuse.[86] Legal powers of compulsory

treatment exist in most countries, which may be good so long as they are not abused. The systematic murder of huge numbers of mentally ill people by the authoritarian regimes of Hitler's Germany and Stalin's Russia may be at the extreme end of the abuse spectrum, but there are myriad other examples of mistreatment and denial of basic rights across the whole world.[87]

More appropriate responses include a range of criminal justice liaison and diversion services which identify people with mental health problems who come into contact with criminal justice agencies such as police or courts, and then direct them towards more appropriate mental health services. There are suggestions of effectiveness,[88] but as yet little economic evidence.

It needs to be emphasized that people with a history of mental health problems have an above-average risk of being the *victims* of crime. The risk of being a victim of violence in the previous 12 months is three to ten times greater for people with severe mental illness compared to the general population.[89] Analyses of national data for Sweden showed that people with mental health problems were five times more likely to be the victim of homicide than people without such problems.[90] Experiencing violence is never good, but the consequences can be magnified for people with pre-existing mental illness. Indeed, people who experience violence – whether in childhood or adulthood – are more likely to develop mental health problems later in life.[91]

Although there are policy and practice issues to be addressed, each with an economic dimension, the key message is this, as summarized by Howard et al in a recent evidence summary: 'Most people with mental illness are not violent, and most people who are violent are not mentally ill'.[92]

3.7. *Suicide and Self-harm*

Self-harm, suicide attempts and successful suicides are all relatively rare but obviously very disturbing events. They are closely linked to mental health problems. They are also strongly associated with socioeconomic deprivation, and with the state of the economy. Many studies have now shown that macroeconomic recession – through its

effects on unemployment levels and duration, job insecurity, earnings, unsecured debt and so on – is associated with higher suicide rates. Chang et al[93] examined data for 54 European and American countries, finding that suicide rates increased significantly after the 2008 global economic crisis, more so for men than women, and more noticeably in countries where the recession was deeper (as measured by job losses). In South Korea, income-related inequalities in depression and suicidal behavior widened enormously over a 10-year period following an earlier economic crisis: poorer groups fared much less well.[94]

Suicide has many distressing impacts. One less distressing but still pertinent impact is the economic cost, including intangible costs such as the value of lost life, lost productivity (both waged and unwaged), police time and funerals. The cost of a completed suicide for someone of working age in the UK has been estimated to exceed £1.6 million, for example.[95] Self-harm and non-fatal suicide attempts can also be costly in terms of emergency and other healthcare, including longer-term psychiatric treatment.[96]

Better identification of people at risk of suicide and better responses to self-harm have been shown to be effective, and there is emerging evidence of cost-effectiveness for interventions such as manual-assisted cognitive behavior therapy (CBT) for adults with a history of recurrent deliberate self-harm,[97] and suicide-awareness training for GPs and other health professionals, followed by CBT[38].

3.8. *Stigma and Discrimination*

The stigma experienced by many people with schizophrenia and psychosis can affect many aspects of their lives, limiting access to employment and housing, harming social relationships, reducing self-esteem and reducing the likelihood that they seek treatment.[98,99] Through its impacts on 'employment, income, public views about resource allocation and healthcare costs' it can also impose sizeable costs.[100]

Evans-Lacko et al[101] systematically mapped European evidence on stigma and social exclusion experienced by people with mental health problems. Although the body of evidence is modest compared to, say, work on clinical trials of interventions, there is now some wide-ranging

and high-quality evidence that documents the stigma, discrimination and social exclusion that is so often experienced. But evidence is sadly lacking on interventions that can reduce stigma and promote social inclusion, and there is also a paucity of evidence on interventions that promote resilience or protect against stigma over the life-course. Social marketing campaigns have been suggested 'as a way to reach the public, to modify health or pro-social behaviors and to promote specific health issues'.[102] These approaches are potentially highly cost-effective.[103,104]

3.9. *Poverty and Inequalities*

Economic 'difficulties' experienced by individuals – such as unemployment, low income, unsecured debt, housing uncertainty and social deprivation – have all been linked with incidence or exacerbation of health problems, including mental illness and, as we noted earlier, suicide.[105] Again as noted above, there is often a vicious circle at work, since having a mental health problem puts an individual at greater risk of employment difficulties, rent arrears, other debt, and poverty.[106,107]

This has generated two hypotheses about the underlying associations. The *social causation hypothesis* argues that economic disadvantage such as poverty increases the risk of mental illness by augmenting risk factors – such as financial stress, stigma, social exclusion, and malnutrition – and decreasing protective factors such as education and social capital. Mental health problems may worsen if someone is unable to access good treatment. The *social selection or 'drift' hypothesis* argues that people with mental health problems face higher risks of remaining or falling into poverty because of the costs of their treatment (if they have to pay themselves), lost or disrupted employment, lower productivity when at work, and hence reduced earnings. The former explanation may be more relevant for disorders such as depression and anxiety, while the latter might be more relevant for severe mental disorders such as schizophrenia.

The strong but often complex links between poverty and mental disorder support the case for targeted anti-poverty programs to break into the cycle, such as provision of effective treatment and support services that are accessible to all, resilience-building efforts, investment in

education and housing, cash transfer and asset-promotion programs, and enforcement of human rights protection.[107,108]

A related question is the impact of inequalities. There are wide and deep-rooted inequalities in incidence and prevalence in relation to mental health needs. Income-related inequalities in mental health are much greater than in physical health.[109] But there are also wide inequalities in access to treatments (and hence to the therapeutic benefits they generate) even in countries like the UK with tax-funded, universal healthcare provision.[110] Those inequalities are not only income-related but also linked to race, ethnicity, gender, age, language, religion, and place of residence.[111]

4. Financing and Expenditure

4.1. *Expenditure*

Global expenditure on mental health has been estimated to average 1.63 US$ per person per year.[112] This is the median amount, around which there is enormous variation: expenditure per capita is more than 200 times higher in high-income countries (US$44.84) than in LAMICs (averaging US$0.20 in low-income, US$0.59 in low-middle-income and US$3.76 in upper-middle-income countries). This wide difference is only partly accounted for by the income level: there are also inter-country differences in total health budgets and the priority attached to mental health within them.[113] The percentage of the health budget allocated to mental health averages 2.8% (median) across all WHO countries for which data are available. LAMICs spend lower percentages of the health budget on mental health: the averages are 0.53% in low-income countries, and 5.10% averaged across high-income countries.

These expenditures look especially low when compared with the contribution of mental disorders to global burden of disease,[114] and help to explain the wide gap between prevalence and treatment (see section 2.2 above). There is also the problem that quite high proportions of expenditure committed to mental health are tied up in mental hospitals in LAMICs (73%, compared to 54% in high-income countries).[112] Those

hospitals can provide treatment only to a small number of people and often what is provided is of dubious quality[115]

Underinvestment in mental health will have unfavorable consequences not only for the mental health and wellbeing of people with or at risk of developing these disorders, but also for economic development.[107] A study for the World Economic Forum estimated the global cost of mental health problems to be US$ 2.5 trillion in 2010 (64% of it occurring in high-income countries), projected to rise to US$ 6.0 trillion by 2030.[116] Two-thirds of the total was accounted for by indirect costs. In the same study, the cumulative global impact of mental disorders in terms of lost economic output was projected to be US$ 16.3 trillion over the next 20 years (with just over half this amount in high-income countries), estimated to be equivalent to more than 1% of GDP.[117] When compared with other non-communicable diseases, mental ill-health ranked alongside cardiovascular disease in terms of its impact on lost economic output, and was substantially greater than cancer, chronic respiratory diseases, and diabetes.

4.2. *Financing*

Financing health care services is complex, with strategic decision-makers – at national, regional or local levels – having to trade-off affordability, targeting, access, equity and efficiency. For most individuals, their risk of needing health care is highly uncertain, but when they are ill, treatment costs and losses in earnings can be huge. This is why all high-income countries rely heavily on pre-payment financing arrangements - through taxation, social health insurance or private voluntary health insurance – in order to pool risks and generally redistribute the benefits of health care towards individuals with greater health needs. If pre-payment arrangements are progressive (with poorer individuals paying lower amounts for equivalent health care), then they are also redistributive in this sense too. Both types of redistribution are important in view of the potentially enormous lifetime costs of mental health treatment and the low socioeconomic status of many people with enduring mental health problems.

The chapter in this volume by Preker et al[118] comprehensively covers the principles of healthcare financing; here we briefly discuss the main advantages and disadvantages of different financing mechanisms specifically in relation to *mental health* care.

Taxation-based financing. Taxes can be levied by one or more different tiers of government; some tax revenues might be hypothecated for specific purposes such as health. Taxation-based financing tends to be progressive, with contributions mandatory and linked to income, thus taking an individual's ability to pay into account. It usually offers universal coverage, which is especially important given that mental illness can leave people socially marginalized and economically disadvantaged: other financing methods may exclude people from coverage if they are not employed or cannot afford insurance premiums (see below). Means-testing can further support redistributive goals, but co-payments may be barriers to utilization for people who are already perhaps reluctant service users, and can therefore undermine pursuit of equity goals.

Although tax-based financing is mainly associated with high-income countries, it is used to resource mental health care in some LAMICs (e.g. Azerbaijan, Kenya, Kyrgyz, Zambia),[119] although these countries may also have high levels of out-of-pocket financing such as user charges and co-payments. Health care funding may fluctuate with the state of the national economy: many countries hit hardest by the recent global economic recession were further hit by governmental austerity measures.[120] In low-income countries, government may not be able to raise sufficient tax revenues to pay for a decent health care system, and – as we have seen – mental health may be a low priority compared to other health needs.[121] People with mental health problems may find that, although they are covered *in principle*, access is limited and quality is poor. Unhypothecated taxes have been criticized for not being transparent, public sector bureaucracy may be seen as a source of inefficiency, politicians might be seen to be using health care for political purposes, and patients may feel that a tax-based system offers them limited choice.

The efficiency and equity implications of a tax-based system depend somewhat on how funds are allocated from the central collecting body

(such as the finance or health ministry) to population subgroups, localities or facilities. In England, fairly sophisticated resource allocation formulae use weightings to capture variations in need linked to age, gender, ethnicity and indicators of disadvantage. But such an approach is quite data-heavy, and less sophisticated systems may allocate on the basis of historical expenditure patterns, which is unlikely to be efficient or fair, nor will it incentivize innovation or better responsiveness.

Social health insurance. The main alternative to taxation in high-income countries is social health insurance (SHI). It is the dominant financing mechanism in much of Western Europe (e.g. in Czech Republic, France, Germany, Netherlands, Romania), with revenue collected by quasi-public bodies ('sickness funds'). SHI is also increasingly common in Asia (e.g. China, Japan, Korea, Malaysia Taiwan), South America (although coverage there tends to be confined to urban areas), and many east European and former Soviet Union states (although other financing mechanisms are also used).[119]

SHI systems differ from country to country, but share some common features: contributions are usually compulsory for all or most of the population, and they are linked to salaries, with employers typically making contributions. People at high risk of mental health problems do not face higher premiums as they would under private voluntary insurance (see below), although if not in employment they may find themselves excluded. If there is no risk-rating, risk-adjustment mechanisms are often used so that no one sickness fund is unduly disadvantaged by the 'risk profile' of the people it covers. Eligibility for benefits is usually standardized for all enrollees. Transfers are often made from general taxation to sickness funds to provide cover for unemployed, retired and other disadvantaged or vulnerable people. In most low-income countries, only those individuals in formal employment tend to be eligible, indeed some SHI schemes are confined to public sector employees in urban areas. This is problematic given that more severe and enduring mental health problems are associated with low employment rates and low income, with the causal connections working in both directions, as we described in section 3.5. Another concern is that an emerging SHI system in a low-income country could divert resources away from poorer regions or individuals. A more general issue is moral

hazard, shared with tax-based financing, when there is no charge at the point of utilization, because individuals may be tempted to over-use health services.

Private (voluntary) health insurance. Private health insurance (or voluntary insurance, as it is sometimes described) shares advantages with tax-based and SHI in that it pools risks across individuals, and allows those individuals to smooth their expected consumption.[118] A major disadvantage of private insurance is that, because it is often risk-rated (offering lower premiums to lower-risk individuals) and not mandatory, it may not be affordable for people with mental health problems (leaving them uninsured), and can lead to adverse selection, and 'cream-skimming'. In other words, low-risk individuals move out of a scheme if asked to pay more than they consider reasonable, and if they feel they are cross-subsidizing high-risk individuals (such as those with enduring mental health problems). Meanwhile, insurers may try to encourage low-risk individuals by charging lower premiums and using high charges or other means to exclude other groups, again including those with mental health problems. If an insurance plan exempts existing conditions from the benefit packages – which is common – then individuals with a family history of mental health problems or suspected genetic predisposition to mental illness (such as schizophrenia or early-onset dementia) could find premiums to be prohibitively expensive or simply unavailable. As our understanding and use of gene profiling develops, this could become a bigger and bigger issue.

Private health insurance may be the *only* financing mechanism available to large parts of the population other than out-of-pocket payments (as historically in the US, with mental health cover being very limited).[122] The failure of this type of financing to provide adequate cover for people with mental health problems led to the Mental Health Parity and Addiction Equity Act (MHPAEA) and the Patient Protection and Affordable Care Act (ACA), both in 2008, which extended health insurance cover to more people and expanded its scope to include mental health and substance abuse benefits.[123] Private health insurance may fulfill other roles: as a *substitute for SHI* (e.g. in Germany for higher paid workers), as a *complement to public entitlement* (e.g. in France to cover co-payments within the public health system, or in Chile where it is

purchased by higher-income groups) or as a *supplement* (e.g. in Ireland to reduce waiting times and improve choice).[124]

Evidence from many countries clearly shows that private health insurance is inefficient and inequitable when looked at from the perspective of people with mental health needs.[119,125,126] It may take heavy regulation, generous subsidies or a tax-based or SHI-based safety net to begin to counter some of these disadvantages.[123,127] Nevertheless, private health insurance has been advocated by the WHO[128] as better than what might be the only alternative in many LAMICs, which is out-of-pocket payments. There has also been growth in use of private insurance to pay for specialist treatment (e.g. for addictions), or by employers to treat work-related stress.

Out-of-pocket payments. Individuals using services may face user charges or co-payments, one aim being to discourage excessive or inappropriate utilization (where the marginal opportunity cost of delivery exceeds what is seen as the marginal social benefit of treatment). In some contexts, out-of-pocket payments may be considered to be the only feasible way to generate revenue for a mental health system because of a weak tax base, low rates of formal employment, or the very low priority given to mental illness (as in Nepal and Pakistan).[119] Indeed, out-of-pocket payments account for significant proportions of total expenditure on mental health care in most low-income countries, although they tend not to be the dominant financing mechanism.

However, such out-of-pocket payments may deter people from accessing treatment when they need it, with the consequence in some cases that symptoms worsen to the point where expensive, crisis-driven care is needed.[129] The adverse effects of such deterrence are likely to be especially acute in relation to mental health problems, where individuals might already be reluctant to seek treatment because of stigma, fear, impaired cognition, or lack of insight into the state of their health. The efficiency and distributional implications could be dire, especially as many of those in need of mental health treatment will be the least able to pay.[126,130] Allowing such individuals to be exempt from charges might be one way to address this problem,[131] but this will add further bureaucracy to what is often already quite a costly system to administer.

International aid. In high-income countries, pre-payment arrangements (various combinations of taxation, social health insurance and private health insurance) dominate both health care financing in general, and mental health financing in particular. However, in most low-income countries, mental health care is still most likely to be funded directly by users or families through out-of-pocket payments. Even though international non-governmental organizations (NGO) and foreign governments might provide sometimes substantial support for health systems, international aid of this kind very often excludes mental health care. It is also highly variable and unstable as a platform for long-term planning.

5. Economic Evaluation for Better Mental Health Policies and Treatment

We have already alluded to economic evaluative evidence in the previous section when discussing the main challenges associated with mental health problems. Here we briefly explain what these evaluations look like, and then discuss some methodological issues that can arise in mental health contexts.

5.1. *Evaluation Questions*

The central clinical or effectiveness question when evaluating an intervention (such as a service, medication, preventive strategy or wider policy initiative) is whether it reduces or removes symptoms or improves quality of life. The economic question is then whether the resources needed to deliver the intervention are justified by the outcomes achieved. There are different 'types' of economic evaluation, sharing many common features, but differing in how they define and measure outcomes, because they seek to address slightly different questions. When evaluating an intervention targeted on a particular patient group in comparison to another intervention for the same disorder (such as two antidepressant medications), the most relevant outcomes will be specific to the diagnosis (alleviation of depressive symptoms) as well as some

more general indicators (such as quality of life and personal functioning). In this case, a cost-effectiveness analysis would be most appropriate, and this is the most commonly conducted type of health economic evaluation. A *cost-effectiveness analysis* tells decision-makers what course of action (i.e. what treatment) best meets clinical needs given available resources.[132]

Some decisions in health and other systems raise broader questions; for example, should available resources be used to provide treatment for more people with depression or more people with schizophrenia or coronary heart disease? In this case, measuring depressive symptoms will not be enough, because patients with schizophrenia or coronary heart disease may have not have these symptoms, and even if they do, there are other treatment aims to take into account, such as reducing psychotic symptoms or reducing the risk of coronary events. An evaluation would therefore need a common measure of outcome that would allow the decision-maker to make comparisons across these different clinical fields. Economists have developed a generic outcome measure ('utility'), often operationalized in terms of quality-adjusted life years (QALYs), which we describe further below. Another generic measure, used mainly in LAMIC studies, is the disability-adjusted life year (DALY). This form of economic evaluation is often called a *cost-utility analysis*: it tells the (strategic) decision-maker where they are likely to get the biggest impact from their resources by deploying them across a range of clinical areas.

An even broader type of economic evaluation is a *cost-benefit analysis*. It is suitable if a decision-maker needs to choose how to allocate resources across quite diverse areas, such as healthcare, education or housing. The only currently feasible generic outcome measure in these circumstances is a monetary valuation of what is achieved. Cost-benefit analyses are not easy to undertake in mental health contexts, as it is difficult to calculate the societal value of the health and other outcomes of interventions.

5.2. *Measuring Costs and Outcomes*

We have already seen that the cost impacts of many mental health problems can range broadly over many services and systems. They can

also extend over many years. We have also noted the multidimensional implications of poor mental health, which implies that the evaluation of the effectiveness of an intervention should aim to assess what happens in each of those various domains. The breadth of cost and outcome measurement is driven by what health economists call the *perspective* of the study: is the evaluation intended to help resource allocation within a particular agency (e.g. a community mental health service), or a particular system (e.g. the healthcare system), or a particular sector (e.g. government), or the whole society? The breadth of perspective will determine the breadth of both cost measurement and, to some extent, the choice of effectiveness or outcome measures.

Costs can be direct and indirect. Direct costs include those associated with treatment of a disorder (e.g. amounts spent on medications and therapy sessions). Indirect costs include the value of lost productivity because of poor mental health, or the (imputed) cost of unpaid care provided by family members. In the mental health field, as we have seen, the indirect costs can often overshadowing direct healthcare costs.

On the outcome side of an economic evaluation, the approach in mental health contexts is the same as in other areas of health, with the most relevant measures when considering treatments for a given disorder being those that assess changes in symptoms, behavior, functioning, and attitudes, and quality of life. QALYs (utilities) or other generic dimensions can also be added as measures to inform more strategic decision-making such as when setting departmental budgets within a hospital, or taking strategic decisions about which needs to prioritize within a national healthcare system. There has been debate as to whether QALYs can be measured well enough for some mental health diagnoses (see below), but almost every health economic evaluation today – in Europe at least – would include a QALY measure, alongside symptom or similar 'clinical' measures. The most widely used QALY-generating tool is the EQ-5D.[133]

Both costs and outcomes would ideally be measured over a period of some years, given the chronicity of most mental illnesses and the potential for long-term gains from the most effective interventions. However, as with any evaluation, it often proves infeasible or too

expensive – or perhaps even ethically inadvisable – to continue to collect data over long periods from the same individuals.

5.3. *Making Trade-offs*

The most difficult challenge in interpreting and using findings from an economic evaluation arises when one intervention is found to be more effective than another but also has higher costs. Which of the two interventions would then be seen to represent the best use of scarce resources? There is no simple answer: it depends what value the decision-maker attaches to the greater effectiveness, i.e. on the trade-off better outcomes and lower costs. This boils down to a value judgement.

Health economic evaluations usually illustrate this trade-off by calculating the incremental cost-effectiveness ratio (ICER), defined as the extra cost associated with a new intervention divided by its additional effectiveness. For example, a study of computerized cognitive behavioral therapy (CCBT) for people with depression or anxiety found it to be better in alleviating symptoms and improving work and social functioning compared to treatment as usual,[134] but it was also found to be more expensive to the health service.[135] The cost of achieving an incremental improvement in depressive symptoms (measured by the Beck Depression Inventory) was found to be £21, equivalent to a cost of £2.50 per depression-free day over the study period. The decision-maker must then take a view as to whether this additional cost is worth paying.

In this same study of CCBT the cost per QALY was £2190. This ICER value is potentially informative because there is a government-funded (but independently managed) body in England and Wales – the National Institute for Health and Care Excellence (NICE) – that was established to help decision-makers in the tax-funded National Health Service (NHS) to weigh up the trade-offs. NICE produces clinical, public health and social care guidelines built on as much evidence as they can find, synthesized into effectiveness and cost-effectiveness conclusions. In helping providers and purchasers to decide whether better outcomes from a particular treatment are ‘worth’ the higher costs that may be needed to achieve them, they aim to calculate the cost per QALY and compare it with a (widely discussed) threshold value for cost-

effectiveness. Currently, a treatment or other intervention that costs more than £30,000 per QALY would generally not be considered 'worth it'.[136] This is because – according to the approach adopted by NICE on behalf of the NHS – the resources (represented by cost) could be better spent elsewhere in the healthcare system (i.e. on a different treatment, not necessarily for the same illness). The NICE threshold provides guidance rather than a rigid decision-making rule, with the intention of reminding everyone (clinical professionals, purchasers, patients, taxpayers and politicians) that resources are scarce, so that choices have to made about how they should be used.[137] Some other countries have similar processes to guide allocation decisions.[138]

5.4. *Uses of Economic Evaluative Evidence*

Results from economic evaluations have many potential uses. Decision-makers in health and related systems across the world are increasingly turning to economics for evidence to inform, shape and support their decisions. More generally, there are many ways in which economic evaluation and other evidence is used. We offer some brief examples here to illustrate how information on costs and cost-effectiveness evidence is being used.

'Cost-of-illness' studies that add up the direct and indirect costs of a particular mental health problem give *lobbyists and advocacy groups* some economic ammunition to argue the case for more attention and resources to improve prevention, treatment and support. Pharmaceutical, medical devices and other companies might also use similar data to draw attention to what they would argue is a neglected or under-resourced area in order to provide a platform for marketing their wares. Those manufacturers might also invest in cost-effectiveness studies to support the case for their products. Indeed, in some countries there may be formal requirements for them to submit information on cost-effectiveness to regulatory or related bodies. Economic evidence can therefore also be used to help shape the local *commissioning* of treatments.

Economic evidence is increasingly being used in the *formulation and monitoring of policy* by public bodies. For example, the Department of Health in England commissioned a study to examine the economic case

for mental health promotion and mental illness prevention.[38] Similarly, the World Health Organization (WHO) has invested in cost-effectiveness evidence within its Choosing Interventions that are Cost Effective program, collating information for each of the 17 WHO sub-regions on the costs, impact on population health and cost-effectiveness of different health interventions.[139]

Some high-income countries have *health technology appraisal* (HTA) mechanisms to formally examine the cost-effectiveness of technologies to inform reimbursement and coverage decisions or develop treatment guidelines. NICE in England and Wales is one such body. In evaluating specific technologies and preparing guidelines for clinical practice, NICE makes copious use of economic evidence.

However, even when there is an economic evidence base, it does not necessarily change policy or practice. There could be a number of barriers in the way.[115] One of the most challenging is resource insufficiency: there are not enough funds to invest in interventions found to be most cost-effective, perhaps because – even though they are effective – they require a net increase in spending. Another barrier could be that available services are poorly distributed, available at the wrong place or time relative to needs, such as the tendency for specialist psychiatric services to be concentrated in large cities in many LAMICs. Or available services may be inappropriate, not matching what is needed or what would be chosen by individuals; for example, resources could have been sunk in large institutions, whereas best practice would be seen to be community-based. Silo-budgeting is another implementation barrier.

5.5. *Evaluative Challenges*

Making an economic case for an intervention does not mean cutting costs but using resources (not just in the healthcare system, but across the whole economy) to their best effect: that is, ensuring that resources are used so as to achieve the greatest gains in health and quality of life.

The pervasive characteristics of mental health problems and their consequences discussed in Section 3 have knock-on implications for the design, conduct, interpretation and utilization of cost-effectiveness and

other evaluative evidence. One immediate implication stems from the fact that most mental disorders, although primarily defined as 'health problems', have spillover effects in other domains of life, and therefore other domains of public policy. The costs of responding to the needs of children with emotional and behavioral problems, for example, tend to be higher in the education sector than in the health sector. The long-term costs of not adequately responding to childhood behavioral problems are much higher in the criminal justice system than in the health system. The major economic impact of depression is lost productivity because of disrupted employment, rather than treatment or crisis-response costs from healthcare interventions.

Moreover, many of those spillover impacts are hidden from view. Lost productivity arising through unemployment or absenteeism may be visible and relatively straightforward to measure, but lost productivity through presenteeism is inherently difficult to quantify. Similarly, unpaid support provided by family members or others to someone with a mental illness is almost by its very nature something that is hidden from view, and yet the responsibilities that go with such support can damage a carer's own health, wellbeing and economic position. Economic evaluations therefore need to be at least cognizant of these wider impacts, and better still to include them as measured elements of a study.

We have also emphasized throughout the chapter that most mental health problems are chronic, and whilst effective treatment may alleviate the symptoms, the underlying condition rarely goes away. Indeed, for some people with particularly complicated circumstances or challenging symptoms, there may be no effective treatment. Interventions are usually judged – if only for pragmatic reasons – by their relatively short-term impacts, whether in terms of effectiveness or cost-effectiveness, whereas the true measure of impact ought generally to be assessed over a much longer period.

A related challenge is what could be called *'diagonal accounting'*, where the costs of an intervention need to be compared with impacts (economic or otherwise) that are not only in another sector but in another time period. When budgets are tight, it can be hard to persuade decision-makers to spend more, especially if the pay-offs will not be seen immediately and will not even benefit their own service or sector.

Some of the savings from an intervention – whether diagonal, vertical or horizontal – may not anyway be cashable. For example, an intervention that reduces hospital admissions but does not (either immediately or perhaps ever) close inpatient beds might not generate any savings at all. Similarly, reducing the time burden on unpaid family carers does not generally release any resources that are transferable to other uses.

Many people with mental health needs also have other needs. The complex interplay between physical and mental health conditions can make evaluation quite challenging. A linked challenge is the problem of sample attrition in research, usually much higher in mental health studies than in other health economic evaluations. This attrition problem can arise partly because of comorbidities, partly because of the fluctuating nature of some mental illnesses which leave people unable to continue in a study or to participate at certain time-points, and partly because some people live chaotic lives as a result of their illness.

We have mentioned earlier the insights gained by using QALY measures in economic evaluations, linked to the difficult task facing some strategic decision-makers of making comparisons and allocating resources across disease areas or medical specialties. In Europe and many other regions of the world, almost every health economic evaluation includes a QALY (or DALY) measure nowadays, usually alongside symptom and similar 'clinical' outcome measures. But the most widely used QALY-generating tools, such as the EQ-5D, do not always perform well (from a psychometric standpoint) in studies of people with severe mental health problems, or for the youngest or oldest patients.[140] Specific QALY measures have therefore been developed for some conditions, such as dementia.[141]

Benefit measurement – in the evaluative sense of converting outcomes to monetary magnitudes – is even more challenging. It is intrinsically difficult to convert an indicator of symptom or quality of life improvement into a monetary value. In those rare cases where the primary outcome is something such as productivity improvement – as with evaluations of supported employment schemes – it is potentially possible to convert the effectiveness scores into something that can be *directly* compared with costs.[73]

6. Public Policy Challenges

Some mental health problems are preventable or the risks of their occurrence can be reduced, such as those stemming from traumatic experience, non- or misdiagnosis. An important public policy theme should therefore be to do better at preventing problems from emerging, but when they do emerge, to identify and treat them early. Moreover, as we have emphasized time and again in this chapter, some of these actions – preventive and ameliorative – are needed outside the health sector as conventionally defined.

Relatedly, therefore, early intervention should be, and commonly is, a core policy theme, with good evidence from a number of different diagnostic areas of the effectiveness and cost-effectiveness of early actions to detect and respond to individual needs and preferences.

Suicide is an especially distressing consequence of poor mental health, even if it is relatively rare. Suicide prevention features quite prominently as an objective of many national mental health plans, and has acquired greater urgency in recent years with the realization that economic recession and macroeconomic responses (‘austerity policies’) are associated with a significantly higher suicide rate.

The roles played by family members in supporting someone with mental health issues are often hidden from view, yet their unpaid, unheralded inputs can often be fundamental to the achievement of a better quality of life. The effects on family members themselves can be considerable, and so an increasingly visible public policy theme is the need to support family carers through information, funding, respite services or family-focused therapies.

Policy needs to address the wide-ranging and durable impacts of many mental health problems, which in turn should imply better co-ordination of local policy and frontline practice responses to ensure that individuals do not ‘fall through the net’ or get conflicting advice from different agencies. There also needs to be a willingness among policy-makers to invest for the longer-term, notwithstanding the almost universal political reluctance to make such commitments.

Another important policy theme is to address the pervasive stigma experienced by people with mental health problems, and how it

manifests itself in discrimination in the workplace, education, social relations, citizenship, and participation. Mental health problems are disabilities, and should therefore be treated in a similar way to physical conditions, but they are also different from those conditions in the extent to which people with them are vilified, ostracized and discriminated against. Mental health problems are associated with economic and social disadvantage, with causal connections potentially flowing in both directions. Consequently, public policy in the area of inequalities should pay particular attention to mental health problems, while public policy in the mental health area should pay particular attention to the risk of social and economic marginalization.

Employment is a key element in all of this, given the social and economic benefits that flow from it. Public policy should engage with the challenges that people with mental health problems face in trying to get a job and keeping it; and also encourage employers to pay attention to the wellbeing and mental health needs of their workforce. This may require economic incentives, particularly in small and medium-sized enterprises.

Successful population-wide anti-poverty policies will have benefits for people with mental health problems, but there may also be a need for targeted action that recognizes the particular vulnerabilities of people with longer-term morbidity. This is another example of the need to take action across a number of conventional sector boundaries, for instance in housing, education, employment, welfare benefits and taxation policy. Seeing health – and therefore mental health – as part of an anti-poverty strategy has been emphasized by bodies such as the WHO but has generally not yet taken root in many low- or middle-income countries.

Financing mechanisms for mental health vary enormously across the world, with out-of-pocket payments still dominating in low-income countries, even though these are neither efficient nor equitable In middle-income and high-income countries, pre-payment mechanisms based on taxation, social health insurance or private health insurance tend to dominate, but can still have their limitations when looking at mental health needs and treatments. This in part explains the wide gap between prevalence and treatment across most of the world, since mental health interventions are funded to highly varying degrees. ‘No health without mental health’ has become such a common slogan as to have become

clichéd, but it reflects the strong view that mental health needs and services have been neglected for too long, especially in most low- and middle-income countries.

Discussions of the economic arguments for mental health interventions should mirror discussions in any other health or indeed other field in terms of relevant criteria and methods. However, some of those methods may not be easily applied in the mental health context, with the result that mental health interventions may face disadvantages in trying to get themselves established.

7. Concluding Comments

As we have demonstrated, most mental health problems are complicated and can have many negative and often distressing consequences for individuals who are unwell, their families, and the wider society. This complexity can make mental illness appear 'expensive', and the durability and wide sphere of impact of many conditions add to the economic consequences. Given the pervasive scarcity of healthcare and other resources, decision-makers will want to think through the economic case for strategies or treatments that might address mental health needs.

What we have just written in the above paragraph could probably be applied to many health problems, but mental illness tends to be different. What is distinctive is a *troublesome combination of interconnected challenges*: onset at a key life-stage; chronicity; absence of a cure; widespread personal shame and public stigma; discrimination in many areas of life; impaired capacity during acute phases of illness; close links to suicide and self-harm; associations with dangerous behavior (even if often exaggerated in the media); and restrictions to individual choice and liberty because of assumed or ascribed incapacity or dangerousness.

These features ought to stimulate searches by all affected parties for effective prevention and early intervention, better treatments that are more widely accessible and better coordination of actions, both across different sectors and over the life-course. Paying attention to the economic consequences is obviously essential.

References

1. Substance Abuse and Mental Health Services Administration, *Results from the 2012 National Survey on Drug Use and Health: Mental Health Findings*, Substance Abuse and Mental Health Services Administration, Rockville, MD (2013).
2. S. McManus, H. Meltzer and T. Brugha, P. Bebbington, R. Jenkins, *Adult Psychiatric Morbidity in England, 2007*, National Centre for Social Research, London, United Kingdom (2009).
3. H. Green, A. McGinnity, H. Meltzer, T. Ford and R. Goodman, *Mental health of children and young people in Great Britain, 2004. A survey carried out by the Office for National Statistics on behalf of the Department of Health and the Scottish Executive,* Palgrave Macmillan, Basingstoke, United Kingdom (2005).
4. Alzheimer's Disease International, *The prevalence of dementia worldwide*, Alzheimer's Disease International, London, United Kingdom (2008).
5. M. Prince, E. Albanese, M. Guerchet and M. Prina, eds., *World Alzheimer Report 2014 Dementia and Risk Reduction. An analysis of protective and modifiable factors*, Alzheimer's Disease International, London, United Kingdom (2014).
6. F. E. Matthews, A. Arthur, L. E. Barnes, J. Bond, C. Jagger, L. Robinson and C. Brayne. A two-decade comparison of prevalence of dementia in individuals aged 65 years and older from three geographical areas of England: results of the Cognitive Function and Ageing Study I and II, *Lancet.* **382**(9902), 1405-1412 (2013).
7. K. M. Langa, Is the risk of Alzheimer's disease and dementia declining?, *Alzheimers Res. Ther.* **7**(1), 34 (2015).
8. H. A. Whiteford, L. Degenhardt, J. Rehm, A. J. Baxter, A. J. Ferrari, H. E. Erskine, F. J. Charlson, R. E. Norman, A. D. Flaxman, N. Johns, R. Burstein, C. J. L. Murray and T. Vos, Global burden of disease attributable to mental and substance use disorders: findings from the Global Burden of Disease Study 2010, *Lancet.* **382**(9904), 1575-1586 (2013).
9. World Health Organization, *Mental health gap action programme: Scaling up care for mental, neurological, and substance use disorders*, World Health Organization, Geneva, Switzerland (2008).
10. S. Scott, M. Knapp, J. Henderson and B. Maughan, Financial cost of social exclusion: follow up study of antisocial children into adulthood, *BMJ.* **323**(7306), 191 (2001).

11. F. D'Amico, M. Knapp, J. Beecham, S. Sandberg, E. Taylor and K. Sayal, Use of services and associated costs for young adults with childhood hyperactivity/conduct problems: 20-year follow-up, *Br. J. Psychiatry.* **204**(6), 441-447 (2014).
12. J. Beecham, Annual research review: Child and adolescent mental health interventions: a review of progress in economic studies across different disorders, *J. Child Psychol. Psychiatry*, **55**(6), 714-732 (2014).
13. A. Goodman, R. Joyce and J. P. Smith, The long shadow cast by childhood physical and mental problems on adult life, *Proc. Natl. Acad. Sci. U. S. A.* **108**(15), 6032-6037 (2011).
14. M. Knapp, D. King, A. Healey and C. Thomas, Economic outcomes in adulthood and their associations with antisocial conduct, attention deficit and anxiety problems in childhood, *J. Ment. Health Policy and Econ.* **14**(3), 137-47 (2011).
15. J. P. Smith and G. C. Smith, Long-term economic costs of psychological problems during childhood, *Soc. Sci. Med.* **71**(1), 110-115 (2010).
16. A. V. Buescher, Z. Cidav, M. Knapp and D. S. Mandell, Costs of autism spectrum disorders in the United Kingdom and the United States, *JAMA Pediatr.* **168**(8), 721-728 (2014).
17. J. Robinson, M. G. Harris, S. M. Harrigan, L. P. Henry, S. Farrelly, A. Prosser, O. Schwartz, H. Jackson and P. D. McGorry, Suicide attempt in first-episode psychosis: A 7.4 year follow-up study, *Schizophr. Res.* **116**(1), 1-8 (2010).
18. I. Melle, J. O. Johannesen, S. Friis, U. Haahr, I. Joa, T. K. Larsen, S. Opjordsmoen, B. R. Rund, E. Simonsen, P. Vaglum and T. McGlashan, Early detection of the first episode of schizophrenia and suicidal behavior, *Am. J. Psychiatry.* **163**(5), 800-804 (2006).
19. E. Killackey, H. J. Jackson and P. D. McGorry, Vocational intervention in first-episode psychosis: individual placement and support v. treatment as usual, *Br. J. Psychiatry.* **193**(2), 114-20 (2008).
20. C. Mihalopoulos, P. McCrone, M. Knapp, J. O. Johannessen, A. Malla and P. McGorry, The costs of early intervention in psychosis: restoring the balance, *Aust. N Z J Pschiatry.* **46**(9), 808-811 (2012).
21. J. Guevara, P. Lozano, T. Wickizer, L. Mell and H. Gephart, Utilization and cost of health care services for children with attention-deficit/hyperactivity disorder, *Pediatrics*, **108**(1), 71-78 (2001).
22. T. D. Nelson, T. R. Smith, R. Pick, M. H. Epstein, R. W. Thompson and T. F. Tonniges, Psychopathology as a predictor of medical service utilization for youth in residential treatment, *J. Behav. Health Serv. Res.* **40**(1) 36-45 (2013).

23. C. K. Chang, R. D. Hayes, G. Perera, M. T. Broadbent, A. C. Fernandes, W. E. Lee, M. Hotopf and R. Stewart, Life expectancy at birth for people with serious mental illness and other major disorders from a secondary mental health care case register in London, *PLoS One*. **6** (5), e19590 (2011).
24. U. Osby, N. Correia, L. Brandt, A. Ekbom and P. Sparen, Time trends in schizophrenia mortality in Stockholm county, Sweden: cohort study, *BMJ*. **321**(7259), 483-484 (2000).
25. N. Myles, H. D. Newall, J. Curtis, O. Nielssen, D. Shiers and M. Large, Tobacco use before, at, and after first-episode psychosis: a systematic meta-analysis, *J. Clin. Psychiatry*. **73**(4), 468-475 (2012).
26. S. McManus, H. Meltzer and J. Campion, *Cigarette smoking and mental health in England. Data from the Adult Psychiatric Morbidity Survey*, National Centre for Social Research, London, United Kingdom (2010).
27. D. L. Foley and K. I. Morley, Systematic review of early cardiometabolic outcomes of the first treated episode of psychosis, *Arch. Gen. Psychiatry.* **68**(6), 609-616 (2011).
28. J. Das Munshi, R. Stewart, K. Ismail, P. E. Bebbington, R. Jenkins and M. J. Prince, Diabetes, common mental disorders, and disability: findings from the UK National Psychiatric Morbidity Survey, *Psychosom. Med.* **69**(6), 543-550 (2007).
29. G. E. Simon, W. Katon, E. H. B. Lin, C. Ruter, W. G. Manning, M. Von Korff, P. Ciechanowski, E. J. Ludman and B. A. Young, Cost effectiveness of systematic depression treatment among people with diabetes mellitus, *Arch. Gen. Psychiatry*. **64**(1), 65-72 (2007).
30. I. Molosankwe, A. Patel, J. Jose Gagliardino, M. Knapp and D. McDaid Economic aspects of the association between diabetes and depression: a systematic review, *J. Affect. Disord.* **142**(Suppl), S42-S55 (2012).
31. W. Katon, J. Unutzer, M. Y. Fan, J. W. Williams, Jr., M. Schoenbaum, E. H. Lin and E. M. Hunkeler, Cost-effectiveness and net benefit of enhanced treatment of depression for older adults with diabetes and depression, *Diabetes Care*. **29**(2), 265-270 (2006).
32. G. E. Simon, W. J. Katon, E. H. Lin, C. Rutter, W. G. Manning, M. Von Korff, P. Ciechanowski, E. J. Ludman and B. A. Young, Cost effectiveness of systematic depression treatment among people with diabetes mellitus, *Arch. Gen. Psychiatry*. **64**(1), 65-72 (2007).

33. C. Naylor, M. Parsonage, D. McDaid, M. Knapp, M. Fossey and A. Galea , *Long-term conditions and mental health: The cost of co-morbidities*, The King's Fund, London, United Kingdom (2012).
34. E. Breuer, L. Myer, H. Struthers and J. A. Joska, HIV/AIDS and mental health research in sub-Saharan Africa: a systematic review, *Afr. J. AIDS Res.* **10**(2), 101-122 (2011).
35. R. Brandt, The mental health of people living with HIV/AIDS in Africa: a systematic review, *Afr. J. AIDS Res*. **8**(2), 123-133 (2009).
36. A. Dow A, Q. Dube, B. W. Pence and A. Van Rie, Postpartum depression and HIV infection among women in Malawi, *J. Acquir. Immune Defic. Syndr.* **65**(3), 359-365 (2014).
37. P. Pleasance and N. Balmer, Changing fortunes: results from a randomised trial of the offer of debt advice in England and Wales, *J. Empirical Legal Stud.* **4**(3), 465-475 (2007).
38. M. Knapp, D. McDaid and M. Parsonage, eds., *Mental Health Promotion and Mental Illness Prevention: the Economic Case.* Department of Health, London, United Kingdom (2011).
39. D. B. Herman, E. S. Susser, L. Jandorf, J. Lavelle and E. J. Bromet, Homelessness among individuals with psychotic disorders hospitalised for the first time: findings from the Suffolk County Mental Health Project, *Am. J. Psychiatry.* **155**(1), 109-113 (1998).
40. D. J. Rog, T. Marshall, R. H. Dougherty, P. George, A. S. Daniels, S. S. Ghose and M. E. Delphin-Rittmon, Permanent supportive housing: assessing the evidence. *Psychiatr. Serv.* **65**(3), 287-294 (2014).
41. T. P. Gilmer, A. Stefancic and S. Etter, Effect of Full-Service Partnership on homelessness, use and costs of mental health services, and quality of life among adults with serious mental illness, *Arch. Gen. Psychiatry.* **66**(6), 645-652 (2010).
42. A. Russolillo, M. Patterson, L. McCandless, A. Moniruzzaman and J. Somers, Emergency Department utilization among formerly homeless adults with mental disorders after one year of Housing First interventions: a randomized controlled trial, *International Journal of Housing Policy.* **14**(1), 79-97 (2014).
43. N. Charrier, K. Chevreul and I. Durand-Zaleski, [The cost of schizophrenia: a literature review], *Encephale.* **39**(Suppl 1), S49-S56 (2013).
44. M. Sado, A. Inagaki, A. Koreki, M. Knapp, L. A. Kissane, M. Mimura and K. Yoshimura, The cost of schizophrenia in Japan, *Neuropsychiatr. Dis. Treat.* **9**, 787-798 (2013).

45. J. Zhai, X. Guo, M. Chen, J. Zhao and Z. Su, An investigation of economic costs of schizophrenia in two areas of China, *Int. J. Ment. Health Syst.* **7**(1), 26 (2013).
46. P. Phanthunane, H. Whiteford, T. Vos and M. Bertram, Economic burden of schizophrenia: empirical analyses from a survey in Thailand, *J Ment Health Policy Econ.* **15**(1), 25-32 (2012).
47. K. Kleine-Budde, E. Touil, J. Moock, A. Bramesfeld, W. Kawohl and W. Rossler, Cost of illness for bipolar disorder: a systematic review of the economic burden, *Bipolar Disord.* **16**(4), 337-353 (2014).
48. M. Luppa, S. Heinrich, M. Angermeyer, H. H. Konig and S. Riedel-Heller, Cost-of-illness studies of depression: a systematic review, *J. Affect. Disord.* **98**(1-2), 29-43 (2007).
49. A. Konnopka, F. Leichsenring, E. Leibing and H. H. Konig, Cost-of-illness studies and cost-effectiveness analyses in anxiety disorders: a systematic review, *J. Affect. Disord.* **114**(1-3), 14-31 (2009).
50. C. M. Thomas and S. Morris, Cost of depression among adults in England in 2000, *Br. J. Psychiatry.* **183**, 514-519 (2003).
51. T. Snell, M. Knapp, A. Healey, S. Guglani, S. Evans-Lacko, J. L. Fernandez, H. Meltzer and T. Ford, Economic impact of childhood psychiatric disorder on public sector services in Britain: estimates from national survey data, *J. Child. Psychol. Psychiatry.* **54**(9), 977-985 (2013).
52. D. E. Bloom, E. T. Cafiero, E. Jané-Llopis, S. Abrahams-Gessel, L. R. Bloom, S. Fathima, A. B. Feigl, T. Gaziano, M. Mowafi, A. Pandya, K. Prettner, L. Rosenberg, B. Seligman, A. Z. Stein and C. Weinstein, *The Global Economic Burden of Noncommunicable Diseases*, World Economic Forum, Geneva, Switzerland (2011).
53. L. Murray and P. Cooper, Effects of postnatal depression on infant development. *Arch. Dis. Child.* **77**(2), 99-101 (1997).
54. S. Pawlby, D. F. Hay, D. Sharp, C. S. Waters and V. O'Keane, Antenatal depression predicts depression in adolescent offspring: prospective longitudinal community-based study, *J. Affect. Disord.* **113**(3), 236-243 (2009).
55. K. Dean, H. Stevens, P. B. Mortensen, R. M. Murray, E. Walsh and C. B. Pedersen, Full spectrum of psychiatric outcomes among offspring with parental history of mental disorder, *Arch. Gen. Psychiatry.* **67**(8), 822-829 (2010).
56. F. P. Velders, G. Dieleman, J. Henrichs, V. W. Jaddoe, A. Hofman, F. C. Verhulst, J. J. Hudziak and H. Tiemeier, Prenatal and postnatal psychological symptoms of

parents and family functioning: the impact on child emotional and behavioural problems, *Eur. Child Adolesc. Psychiatry.* **20**(7), 341-350 (2011).

57. D. W. Johnston, C. Propper, S. Pudney and M. A. Shields, C*hild Mental Health and Educational Attainment: Multiple Observers and the Measurement Error Problem*, Institute for the Study of Labor (IZA), Bonn, Germany (2011).
58. A. Bauer, S. Pawlby, D. T. Plant, D. King, C. M. Pariante and M. Knapp, Perinatal depression and child development: exploring the economic consequences from a South London cohort, *Psychol. Med.* **45**(1), 51-61 (2015).
59. C. J. Morrell, R. Warner, P. Slade, S. Dixon, S. Walters, G. Paley and T. Brugha, Psychological interventions for postnatal depression: cluster randomised trial and economic evaluation: the PoNDER trial, *Health Technol. Assess.* **13**(30), iii-iv, xi-xiii, 1-153 (2009).
60. L. Smith, J. Onwumere, T. Craig, S. McManus, P. Bebbington and E. Kuipers, Mental and physical illness in caregivers: results from an English national survey sample, *Br. J. Psychiatry.* **205**(3), 197-203 (2014).
61. F. Pharoah, J. Mari, J. Rathbone and W. Wong, Family intervention for schizophrenia, Cochrane Database Syst Rev. **2010**(12), CD000088 (2010).
62. M. Knapp, A. Andrew, D. McDaid, V. Iemmi, P. McCrone, A. Park, M. Parsonage, J. Boardman and G. Shepherd, *Investing in Recovery. Making the business case for effective interventions for people with schizophrenia and psychosis*. Rethink Mental Illness, London, United Kingdom (2014).
63. A. Wimo and M. Prince, World Alzheimer Report 2010. The Global Economic Impact of Dementia, Alzheimer's Disease International , London, United Kingdom (2010).
64. R. Mahoney, C. Regan, C. Katona and G. Livingston, Anxiety and depression in family caregivers of people with Alzheimer disease: the LASER-AD study, *Am J Geriatr Psychiatry.* **13**(9), 795-801 (2005).
65. M. Knapp, D. King, R. Romeo, B. Schehl, J. Barber, M. Griffin, P. Rapaport, D. Livingston, C. Mummery, Z. Walker, J. Hoe, E. L. Sampson, C. Cooper and G. Livingston, Cost effectiveness of a manual based coping strategy programme in promoting the mental health of family carers of people with dementia (the START (STrAtegies for RelaTives) study): a pragmatic randomised controlled trial, *BMJ.* **347**: f6342 (2013).
66. G. Livingston, J. Barber, P. Rapaport, M. Knapp, M. Griffin, D. King, R. Romeo, D. Livingston, C. Mummery, Z. Walker, J. Hoe and C. Cooper, Long-term clinical and cost-effectiveness of psychological intervention for family carers of people with

dementia: a single-blind, randomised, controlled trial, *Lancet Psychiatry*, **1**(7), 537-548 (2014).

67. Organisation for Economic Co-operation and Development, *Sick on the job? Myths and realities about mental health and work*, OECD Publishing, Paris, France (2012).
68. R. C. Kessler, S. Heeringa, M. D. Lakoma, M. Petukhova, A. E. Rupp, M. Schoenbaum, P. S. Wang and A. M. Zaslavsky, Individual and societal effects of mental disorders on earnings in the United States: results from the national comorbidity survey replication, *Am. J. Psychiatry.* **165**(6), 703-711 (2008).
69. N. Kawakami, E. A. Abdulghani, J. Alonso, E. J. Bromet, R. Bruffaerts, J. M. Caldas-de-Almeida, W. T. Chiu, G. de Girolamo, R. de Graaf, J. Fayyad, F. Ferry, S. Florescu, O. Gureje, C. Hu, M. D. Lakoma, W. Leblanc, S. Lee, D. Levinson, S. Malhotra, H. Matschinger, M. E. Medina-Mora, Y. Nakamura, M. A. Oakley Browne, M. Okoliyski, J. Posada-Villa, N. A. Sampson, M. C. Viana and R. C. Kessler, Early-life mental disorders and adult household income in the World Mental Health Surveys, *Biol. Psychiatry.* **72**(3), 228-237 (2012).
70. C. Fitch, S. Hamilton, P. Bassett and R. Davey, The relationship between personal debt and mental health: a systematic review, *Mental Health Review Journal.* **16**(4), 153-166 (2011).
71. S. Evans-Lacko, M. Knapp, P. McCrone, G. Thornicroft and R. Mojtabai, The mental health consequences of the recession: economic hardship and employment of people with mental health problems in 27 European countries, *PLoS One.* **8**(7), e69792 (2013).
72. G. R. Bond, R. E. Drake and D. R. Becker, Generalizability of the Individual Placement and Support (IPS) model of supported employment outside the US, *World Psychiatry.* **11**(1), 32-39 (2012).
73. M. Knapp, A. Patel, C. Curran, E. Latimer, J. Catty, T. Becker, R. E. Drake, A. Fioritti, R. Kilian, C. Lauber, W. Rossler, T. Tomov, J. van Busschbach, A. Comas-Herrera, S. White, D. Wiersma and T. Burns, Supported employment: cost-effectiveness across six European sites, *World Psychiatry.* **12**(1), 60-68 (2013).
74. S. Evans-Lacko and M. Knapp, Importance of social and cultural factors for attitudes, disclosure and time off work for depression: findings from a seven country European study on depression in the workplace. *PLoS ONE.* **9**(3), e91053 (2014).

75. P. Mills, R. Kessler, J. Cooper and S. Sullivan, Impact of a health promotion program on employee health risks and work productivity, *Am. J. Health Promot.* **22**(1), 45-53 (2007).
76. P. S. Wang, A. Patrick, J. Avorn, F. Azocar, E. Ludman, J. McCulloch, G. Simon and R. Kessler, The costs and benefits of enhanced depression care to employers, *Arch. Gen. Psychiatry.* **63**(12), 1345-1353 (2006).
77. H. H. Hamberg-van Reenen, K. I. Proper and M. van den Berg M, Worksite mental health interventions: a systematic review of economic evaluations, *Occup. Environ Med.* **69**(11), 837-845 (2012).
78. Thornicroft, R. Goulden, G. Shefer, D. Rhydderch, D. Rose, P. Williams, G. Thornicroft and C. Henderson, Newspaper coverage of mental illness in England 2008-2011, *Br. J. Psychiatry Suppl.* **202**(s55), s64-s9 (2013).
79. S. Scott, M. Knapp, J. Henderson and B. Maughan, Financial cost of social exclusion: follow up study of antisocial children into adulthood, *BMJ.* **323**(7306), 191 (2001).
80. A. Healey, M. Knapp, J. Marsden, M. Gossop and D. Stewart, Criminal outcomes and costs of treatment services for injecting and non-injecting heroin users: evidence from a national prospective cohort survey, *J. Health Serv. Res. Policy.* **8**(3), 134-141 (2003).
81. S. Flynn, C. Rodway, L. Appleby and J. Shaw, Serious Violence by People With Mental Illness: National Clinical Survey, *J. Interpers. Violence.* **29**(8), 1438-1458 (2014).
82. O. Nielssen and M. Large, Rates of homicide during the first episode of psychosis and after treatment: a systematic review and meta-analysis, *Schizophr. Bull.* **36**(4), 702-712 (2010).
83. J. W. Swanson, C. E. Holzer, 3rd, V. K. Ganju and R. T. Jono, Violence and psychiatric disorder in the community: evidence from the Epidemiologic Catchment Area surveys, *Hosp. Community Psychiatry.* **41**(7), 761-70 (1990).
84. M. S. Swartz, J. W. Swanson, V. A. Hiday, R. Borum, H. R. Wagner and B. J. Burns, Violence and severe mental illness: the effects of substance abuse and nonadherence to medication, *Am. J. Psychiatry.* **155**(2), 226-31 (1998).
85. A. P. Wilper, S. Woolhandler, J. W. Boyd, K. E. Lasser, D. McCormick, D. H. Bor and D. U. Himmelstein, The health and health care of US prisoners: results of a nationwide survey, *Am. J. Public Health*. **99**(4), 666-672 (2009).

86. J. Yoon, M. E. Domino, E. C. Norton, G. S. Cuddeback and J. P. Morrissey, The impact of changes in psychiatric bed supply on jail use by persons with severe mental illness, *J. Ment. Health Policy Econ.* **16**(2), 81-92 (2013).
87. R. van Voren, Political abuse of psychiatry: an historical overview, *Schizophr. Bull.* **36**(1), 33-35 (2010).
88. D. A. Scott, S. McGilloway, M. Dempster, F. Browne and M. Donnelly, Effectiveness of criminal justice liaison and diversion services for offenders with mental disorders: a review, *Psychiatr. Serv.* **64**(9), 843-849 (2013).
89. K. Hughes, M. A. Bellis, L. Jones, S. Wood, G. Bates, L. Eckley, E. McCoy, C. Mikton, T. Shakespeare and A. Officer, Prevalence and risk of violence against adults with disabilities: a systematic review and meta-analysis of observational studies, *Lancet.* **379**(9826), 1621-9 (2012).
90. C. Crump, K. Sundquist, M. A. Winkleby and J. Sundquist, Mental disorders and vulnerability to homicidal death: Swedish nationwide cohort study, *BMJ.* **346**, f557 (2013).
91. J. G. Green, K. A. McLaughlin, P. A. Berglund, M. J. Gruber, N. A. Sampson, A. M. Zaslavsky and R. C. Kessler, Childhood adversities and adult psychiatric disorders in the national comorbidity survey replication I: associations with first onset of DSM-IV disorders, *Arch. Gen. Psychiatry*, **67**(2), 113-123 (2010).
92. L. M. Howard, J. Shaw, S. Oram, H. Khalifeh, S. Flynn. *Violence and mental health*, In ed. S. C. Davies, *Annual Report of the Chief Medical Officer 2013. Public Mental Health Priorities: Investing in the Evidence*, Department of Health, London, United Kingdom, pp. 227-238 (2014).
93. S. S. Chang, D. Stuckler, P. Yip and D. Gunnell, Impact of 2008 global economic crisis on suicide: time trend study in 54 countries, *BMJ.* **347**, f5239 (2013).
94. J. Hong, M. Knapp and A. McGuire, Income-related inequalities in the prevalence of depression and suicidal behaviour: a 10-year trend following economic crisis, *World Psychiatry.* **10**(1), 40-44 (2011).
95. S. Platt, J. McLean, A. McCollam, A. Blamey, M. Mackenzie, D. McDaid, M. Maxwell, E. Halliday and A. Woodhouse, *Evaluation of the first phase of Choose Life: the national strategy and action plan to prevent suicide in Scotland*, Scottish Executive Social Research, Edinburg, United Kingdom, (2006).
96. J. M. Sinclair, A. Gray, O. Rivero-Arias, K. E. Saunders and K. Hawton, Healthcare and social services resource use and costs of self-harm patients, *Soc. Psychiatry Psychiatr. Epidemiol.* **46**(4), 263-271 (2011).

97. S. Byford, M. Knapp, J. Greenshields, O. C. Ukoumunne, V. Jones, S. Thompson, P. Tyrer, U. Schmidt and K. Davidson, Cost-effectiveness of brief cognitive behaviour therapy versus treatment as usual in recurrent deliberate self-harm: a decision-making approach, *Psychol. Med.* **33**(6), 977-986 (2003).
98. G. Thornicroft, *Shunned: Discrimination against people with mental illness*, Oxford University Press, Oxford, United Kingdom (2006).
99. C. Lauber and W. Rossler, Stigma towards people with mental illness in developing countries in Asia, *Int. Rev. Psychiatry.* **19**(2), 157-178 (2007).
100. J. Sharac, P. McCrone, S. Clement and G. Thornicroft, The economic impact of mental health stigma and discrimination: a systematic review, *Epidemiol. Psichiatr. Soc.* **19**(3), 223-232 (2010).
101. S. Evans-Lacko, E. Courtin, A. Fiorillo, M. Knapp, M. Luciano, A. L. Park, M. Brunn, S. Byford, K. Chevreul, A. K. Forsman, L. Gulacsi, J. M. Haro, B. Kennelly, S. Knappe, T. Lai, A. Lasalvia, M. Miret, C. O'Sullivan, C. Obradors-Tarrago, N. Rusch, N. Sartorius, V. Svab, J. van Weeghel, C. Van Audenhove, K. Wahlbeck, A. Zlati, D. McDaid and G. Thornicroft, The state of the art in European research on reducing social exclusion and stigma related to mental health: a systematic mapping of the literature, *Eur. Psychiatry.* **29**(6), 381-389 (2014).
102. S. Evans-Lacko, E. Malcolm, K. West, D. Rose, J. London, N. Rusch, K. Little, C. Henderson and G. Thornicroft, Influence of Time to Change's social marketing interventions on stigma in England 2009-2011, *Br. J. Psychiatry Suppl.* **55**, s77-s88 (2013).
103. S. Evans-Lacko, C. Henderson, G. Thornicroft and P. McCrone, Economic evaluation of the anti-stigma social marketing campaign in England 2009-2011, *Br. J. Psychiatry Suppl.* **55**, s95-s101 (2013).
104. P. McCrone, M. Knapp, M. Henri and D. McDaid, The economic impact of initiatives to reduce stigma: demonstration of a modelling approach, *Epidemiol. Psichiatr. Soc.* **19**(2), 131-9 (2010).
105. D. Stuckler and S. Basu, *The Body Economic: Why Austerity Kills*, Basic Books, London, United Kingdom (2013).
106. V. Patel and A. Kleinman, Poverty and common mental disorders in developing countries, *Bull. World Health Organ.* **81**(8), 609-615 (2003).
107. M. Funk, N. Drew and M. Knapp, Mental health, poverty and development, J. Public Mental Health. **11**(4), 166-185 (2012).

108. C. Lund, M. De Silva, S. Plagerson, S. Cooper, D. Chisholm, J. Das, M. Knapp and V. Patel, Poverty and mental disorders: breaking the cycle in low-income and middle-income countries, *Lancet.* **378**(9801), 1502-1514 (2011).
109. R. Mangalore, M. Knapp and R. Jenkins, Income-related inequality in mental health in Britain: the concentration index approach, *Psychol. Med.* **37**(7), 1037-1045 (2007).
110. Social Exclusion Unit, *Mental Health and Social Exclusion*, Cabinet Office, London, United Kingdom (2004).
111. M. Alegria, M. Vallas and A. J. Pumariega, Racial and ethnic disparities in pediatric mental health, *Child Adolesc. Psychiatr. Clin. N. Am.* **19**(4), 759-774 (2010).
112. World Health Organization, *Mental health atlas 2011*, World Health Organization, Geneva, Switzerland (2011).
113. J. Ormel, M. Petukhova, S. Chatterji, S. Aguilar-Gaxiola, J. Alonso, M. C. Angermeyer, E. J. Bromet, H. Burger, K. Demyttenaere, G. de Girolamo, J. M. Haro, I. Hwang, E. Karam, N. Kawakami, J. P. Lepine, M. E. Medina-Mora, J. Posada-Villa, N. Sampson, K. Scott, T. B. Ustun, M. Von Korff, D. R. Williams, M. Zhang and R. C. Kessler. Disability and treatment of specific mental and physical disorders across the world: Results from the WHO World Mental Health Surveys, *Br. J. Psychiatry*, **192**(5), 368-375 (2008).
114. M. DeSilva, C. Samele, S. Saxena, V. Patel and A. Darzi. Policy actions to achieve integrated community-based mental health services, *Health Aff. (Millwood)*, **33**(9), 1595-1602 (2014).
115. M. Knapp, M. Funk, C. Curran, M. Prince, M. Grigg and D. McDaid, Economic barriers to better mental health practice and policy, *Health Policy Plan.* **21**(3), 157-170 (2006).
116. D. E. Bloom, E. T. Cafiero, E. Jané-Llopis, S. Abrahams-Gessel, L. R. Bloom, S. Fathima, A. B. Feigl, T. Gaziano, M. Mowafi, A. Pandya, K. Prettner, L. Rosenberg, B. Seligman, A. Z. Stein and C. Weinstein, *The Global Economic Burden of Noncommunicable Diseases*, World Economic Forum, Geneva, Switzerland (2011).
117. World Health Organization, *Investing in mental health: evidence for action*, World Health Organization, Geneva, Switzerland (2013).
118. A. S. Preker, S. Glied, D. Chernichovsky and M. G. Lapetra, *Economics of financing health care*, In ed. R. Scheffler, *World Scientific Handbook of Global Health Economics and Public Policy*, pp. XX-XX. World Scientific Publishing Co. (2016).

119. A. Dixon, D. McDaid, M. Knapp and C. Curran. Financing mental health: equity and efficiency concerns for low and middle income countries, *Health Policy and Plan.*, **21**(3), 171-182 (2006).
120. D. Stuckler and S. Basu, *The Body Economic*, Basic Books, New York, United States (2013).
121. S. Saxena, G. Thornicroft, M. Knapp and H. Whiteford. Scarcity, inequity and inefficiency of resources: three major obstacles to better mental health, *Lancet*, **370**(9590), 878-889 (2007).
122. R. G. Frank and S. Glied. Changes in mental health financing since 1971: implications for policymakers and patients, *Health Aff. (Millwood)*, **25**(3), 601-613 (2006).
123. R. G. Frank, K. Beronio and S. A. Glied. Behavioral health parity and the Affordable Care Act, *J. Soc. Work Disabil. Rehabil.*, **13**(1-2), 31-43 (2014).
124. E. Mossialos and S. Thomson, *Voluntary Health Insurance in the European Union*, European Observatory on Health Systems and Policies, Brussels, Belgium (2004).
125. R G Frank and S Glied, *Better but not Well: US Mental Health Policy since 1950*, Johns Hopkins University Press, Baltimore, United States (2006).
126. V. de Menil, M. Knapp, D. McDaid and F. Njenga. Service use, charge, and access to mental healthcare in a private Kenyan inpatient setting: the effects of insurance, *PLoS One*, **9**(3), e90297 (2014).
127. D. M. Parameshvara. Malaysia Mental Health Country Profile, *Int. Rev. Psychiatry*, **16**(1-2) 167-176 (2004).
128. World Health Organization, *The World Health Report 2000: Health Systems: Improving Performance*, World Health Organization, Geneva, Switzerland (2000).
129. S. B. Soumerai, T. J. McLaughlin, D. Ross-Degnan, C. S. Casteris and P. Bollini. Effects of limiting Medicaid drug-reimbursement benefits on the use of psychotropic agents and acute mental health services by patients with schizophrenia, *N. Engl. J. Med.*, 3**31**(10), 650-655 (1994).
130. R. Tamblyn, R. Laprise, J. A. Hanley, M. Abrahamowicz, S. Scott, N. Mayo, J. Hurley, R. Grad, E. Latimer, R. Perreault, P. McLeod, A. Huang, P. Larochelle and L. Mallet. Adverse Events Associated with Prescription Drug Cost-Sharing among Poor and Elderly Persons, *JAMA*, **285**(4), 421-429 (2001).
131. F. Nyonator and J. Kutzin J. Health for Some? The Effects of User Fees in the Volta Region of Ghana. *Health Policy and Plan.*, **14**(4), 329-341 (1999).
132. S. Petrou and A. Gray, Economic evaluation alongside randomised controlled trials: design, conduct, analysis, and reporting, *BMJ*. **342**, d1548 (2011).

133. EuroQol Group, EuroQoL: a new facility for the measurement of health-related quality of life, *Health Policy.* **16**(3), 199-208 (1990).
134. J. Proudfoot, C. Ryden, B. Everitt, D. A. Shapiro, D. Goldberg, A. Mann, A. Tylee, I. Marks and J. A. Gray, Clinical efficacy of computerised cognitive-behavioural therapy for anxiety and depression in primary care: randomised controlled trail, *Br. J. Psychiatry.* **185**, 46-54 (2004).
135. P. McCrone, M. Knapp, J. Proudfoot, C. Ryden, K. Cavanagh, D. A. Shapiro, S. Ilson, J. A. Gray, D. Goldberg, A. Mann, I. Marks, B. Everitt and A. Tylee, Cost-effectiveness of computerised cognitive behavioural therapy for anxiety and depression in primary care: randomised controlled trial, *Br. J. Psychiatry.* **185**, 55-62 (2004).
136. National Institute for Health and Clinical Excellence, *Guide to the methods of technology appraisal*, National Institute for Health and Clinical Excellence, London, United Kingdom (2008).
137. J. Appleby, N. Devlin and D. Parkin, NICE's cost-effectiveness threshold, *BMJ.* **335**(7616), 358-359 (2007).
138. D. McDaid and R. Cookson, Evaluating health care interventions in the European Union, *Health Policy*. **63**(2), 133-139 (2003).
139. D. Chisholm, M. van Ommeren, J. L. Ayuso-Mateos and S. Saxena, Cost-effectiveness of clinical interventions for reducing the global burden of bipolar disorder. *Br. J. Psychiatry*. **187**(6), 559-567 (2005).
140. B. Mulhern, C. Mukuria, M. Barkham, M. Knapp, S. Byford and J. Brazier, Using generic preference based measures in mental health: the psychometric performance of EQ-5D and SF-6D, *Br. J. Psychiatry.* **205**(3), 236-243 (2014).
141. B. Mulhern, D. Rowen, J. Brazier, S. Smith, R. Romeo, R. Tait, C. Watchurst, K. C. Chua, V. Loftus, T. Young, D. Lamping, M. Knapp, R. Howard and S. Banerjee, Development of DEMQOL-U and DEMQOL-PROXY-U: generation of preference-based indices from DEMQOL and DEMQOL-PROXY for use in economic evaluation, *Health Technol. Assess.* **17**(5), 1-140 (2013).