

## Excess mortality, mental illness and global burden of disease

The Global Burden of Disease study (GBD), now in its second iteration, has been and will continue to be very influential in shaping health priorities. By providing empirical estimates of disease burden based on robust methodologies GBD has changed government thinking about priorities for health service delivery, and provides an empirical basis for setting priorities for service reform, funding allocations and research priorities based on evidence of burden and potential impact.

However, as highlighted by Charlson *et al* (2015) the GBD presentation does not always tell the full story. In any accounting exercise, decisions need to be made about classifications and the choice of how to summarise a wealth of data into the most important headline indicators. The GBD has focussed on years of life lost (YLLs) and years lived with disability (YLDs) (Whiteford *et al*, 2013). Charlson *et al* (2015) provide illuminating additional information about the burden of mortality due to mental illness than could be shown in the YLL summary measures presented in the main GBD reports. These data show that although YLLs directly attributed to mental illness are a cause of concern, they are small in comparison to the excess mortality observed in people with mental illness using natural history models. This gap could be even larger than Charlson *et al* have calculated. Schizophrenia is the only mental disorder currently included in the cause-specific calculation of YLLs. The natural history models additionally examine excess mortality in major depressive disorder, bipolar disorder and substance use disorders, but anxiety disorders have not been included. Our own data from Western Australia found that anxiety disorders have high prevalence and at least some anxiety disorders are associated with similar levels of excess mortality as depression (Lawrence *et al*, 2013). More epidemiological research is needed on the health outcomes of people with anxiety disorders before they could be included in this analysis, but if the WA results are confirmed in other sites the burden of excess mortality associated with mental illness could be even higher than as stated by Charlson *et al*.

The high level of excess mortality associated with mental illness is one indicator of disturbing inequalities in health outcomes for people with mental illness that deserve serious attention (Thornicroft, 2013). The gap between the YLL analysis and the results of the natural history models is instructive in what it implies about the nature of the gap in life expectancy for people with mental illness and the possibility that it could be reduced even without a major new breakthrough in treating or preventing mental illness. With the most notable exception of dementia which remains an incurable, terminal illness, there are no known biological mechanisms to believe that mental illnesses are direct causes of death. This gives hope that the excess mortality in people with mental illness is an inequality that is potentially remediable even while we do not yet know how to prevent or cure all mental illness. For instance, there are a range of evidence-based treatments for cardiovascular disease (CVD) including procedural interventions such as angioplasty, stenting and bypass grafts and pharmaceutical interventions such as aspirin, angiotensin-converting enzyme inhibitors, and beta-blockers. However, people with both mental illness and CVD are less likely to receive these interventions than people with CVD who don't have mental illness (Mitchell *et al*, 2009;

Druss *et al*, 2000). This could be a part contributor to the excess CVD mortality in people with mental illness. Despite this, there is no suggestion that these interventions are less effective in people with mental illness. While some have argued that mental illness is a valid contra-indication for surgical procedures because of compliance with follow-up care (Garg & Garg, 2011), this view remains controversial (Lawrence and Kisely, 2010). However there is no suggestion that mental illness is a contra-indication for prescribing pharmaceutical interventions. The gap in prescribing likely reflects inequitable access to health care screening and health service delivery. This suggests that even without new preventions or treatments for mental illness it should be possible to make gains in improving health outcomes for people with mental illness.

A downside of the GBD approach of attributing disease burden to individual disorders and risk factors is to downplay the role of comorbidity and complexity in population-level disease burden. As medical care has become increasingly specialised, greater effort is required to provide integrated and holistic health care for people with multiple health problems. Our natural desire to reduce large data sets to simple indicators mimics our tendency to seek simple solutions, even to complex problems. The literature on excess mortality in mental illness has identified a substantial range of contributing factors, from the side effects of psychotropic medications, associations between mental illness and risk behaviours such as smoking, poor diet and lack of exercise, the cognitive impacts of mental illness in influencing access to health care, the role of stigma in reducing access to health care, and silos of mental and physical health care delivery all play a role (Lawrence and Kisely, 2010).

For instance, CVD is one of the major causes of excess death in people with mental illness. While the GBD data could be used to ask the question of what health specialty to devote more resources to: cardiovascular disease or mental health, the comparative risk assessment presented by Charlson *et al* makes clear that people with mental illness experience a higher degree of burden due to CVD and vice versa a substantial proportion of the burden due to CVD is experienced by people with mental illness. Whether there is a causal association between mental illness and CVD or not, it seems clear at least from a treatment perspective and arguably from a prevention perspective as well, integrated care and treatment solutions will be an important component of improving health outcomes for both groups.

One clearly established risk factor for CVD is smoking. While it is unclear if the association between smoking and mental illness is causal and in which direction the causality might be, there is ample evidence that at least in high income countries (HICs) the smoking rate among people with mental illness is high, and reciprocally a high proportion of those who smoke have mental illness (Lasser *et al*, 2000). One key aspect of cardiovascular disease prevention has been reducing tobacco consumption. Evidence to date suggests that tobacco control efforts in HICs have had their least success in people with mental illness (Prochaska, 2011). Similar associations exist for a number of other health risk factors including alcohol and other drugs. Whether we have evidence to determine if there is a causal link between mental illness and these health risk factors doesn't diminish the need to address both the health risk factor and mental illness in effective interventions.

There is established evidence that people with mental illness have high rates of comorbidities with physical health problems and health risk factors. As demonstrated by Charlson *et al*, the burden of excess mortality around the globe is high. There have been some early steps to address the underlying inequalities. There are a growing range of clinical guidelines and position statements (e.g., de Hert *et al*, 2009; Marder *et al*, 2004). There have also been some small-scale trials of potentially effective interventions with promising results such as the use of peer supporters (Druss *et al*, 2010a), and trials of integrated care models (Druss and von Esenwein, 2006; Druss *et al*, 2010b). What is needed now is to use the GBD results and associated information, as developed by Charlson *et al*, to change public health priorities, to set goals for progress and to use ongoing indicator series as measures against these goals, and to implement some of the promising programs and models within an evaluation framework that improves our knowledge of effective interventions going forward.

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