3. Disability: the invisible burden

3. This section summarizes Volume 1, Chapter 4, pp 201 to 246.

3.1 How the GBD assessed disability

A disease or injury may have multiple disabling effects, or sequelae. For example, diabetes may result in diabetic foot, retinopathy, neuropathy, or amputation. To estimate the total burden of disability, the study measured the amount of time lived with each of the various disabling sequelae of diseases and injuries, in both treated and untreated states, and weighted for their severity, in each population. In all, 483 disabling sequelae of diseases and injuries were analysed for this study, for all regions and age groups, and for both sexes.

To calculate the number of years lived with a disabling condition, it is necessary to know its incidence, the average age of its onset, the average duration of the disability (whether just months or lifelong) and the severity weight for the condition. The GBD researchers requested epidemiological specialists to estimate each of these variables for each condition based on an in-depth review of published and unpublished studies. They also estimated the prevalence of each sequela, its case-fatality rates, remission rates and death rates. This information allowed them to correct the preliminary estimates for internal consistency—that is, to ensure that estimated prevalence was consistent with estimated incidence and vice versa. Consistency was validated using a model developed specially for the study, known as DisMod. Frequently, inconsistencies were detected, and epidemiological specialists were asked to revise their initial estimates. Overall, the team took the disability estimates through three complete rounds of revision in a process lasting nearly five years.

The severity weights of different conditions were set using the protocol described in Section 1. A set of 22 indicator conditions ranging from mild to severe disabilities were assigned to seven classes of severity weight between 0 (perfect health) and 1 (equivalent to death). Following this exercise, each remaining condition was assigned a distribution across these seven classes.

The number of years lived with a given disability for each individual were calculated from the incidence of the disability, with the "stream" of disability arising from it measured from the age of onset, for the estimated duration of the disability, multiplied by the condition's severity weight. To calculate the YLDs due to a condition in any given population, the number of YLDs lost per incident case must be multiplied by the number of incident cases. For example, a case of asthma carries a disability weight of 0.1 if untreated and 0.06 if treated. If the incidence of asthma in males aged 15-44 years is 1 million, the untreated proportion is 35 per cent, and the average duration is seven years, then this sequela alone is estimated to cause 664 000 YLDs in a given year for that demographic group.

Unlike the estimates of years of life lost, not all sequelae of all conditions could be explicitly assessed for YLDs. Estimates for conditions not

explicitly considered were made on the basis of information on the ratio of total premature mortality (years of life lost) to disability (YLDs) for each broad cause Group.

3.2 Results: the unseen burden of psychiatric disease

The GBD's findings demonstrate clearly that disability plays a central role in determining the overall health status of a population. Yet that role has until now been almost invisible to public health. The leading causes of disability are shown to be substantially different from the leading causes of death, thus casting serious doubt on the practice of judging a population's health from its mortality statistics alone.

Mental Illnesses

Most significantly, the study shows that the burden of psychiatric conditions has been heavily underestimated. Of the ten leading causes of disability worldwide in 1990, measured in years lived with a disability, five were psychiatric conditions: unipolar depression, alcohol use, bipolar affective disorder (manic depression) schizophrenia and obsessive-compulsive disorder. Unipolar depression alone was responsible for more than one in every ten years of life lived with a disability worldwide. Altogether, psychiatric and neurological conditions accounted for 28 per cent of all YLDs, compared with 1.4 per cent of all deaths and 1.1 per cent of years of life lost. The predominance of these conditions is by no means restricted to the rich countries, although their burden is highest in the Established Market Economies. They were the most important contributor to YLDs in all regions except Sub-Saharan Africa, where they accounted for a relatively modest 16 per cent of the total.

Alcohol use is the leading cause of male disability—and the tenth largest in women—in the developed regions. More surprisingly, perhaps, it is also the fourth largest cause in men in developing regions. The remaining important causes of YLDs were anaemia, falls, road traffic accidents, chronic obstructive pulmonary disease and osteoarthritis (Table 3).

Table 3 The leading causes of disability, world, 1990

		Total (millions)	Per cent of total
	All Causes	472.7	
1	Unipolar major depression	50.8	10.7
2	Iron-deficiency anaemia	22.0	4.7
3	Falls	22.0	4.6
4	Alcohol use	15.8	3.3
5	Chronic obstructive pulmonary disease	14.7	3.1
6	Bipolar disorder	14.1	3.0
7	Congenital anomalies	13.5	2.9
8	Osteoarthritis	13.3	2.8
9	Schizophrenia	12.1	2.6
10	Obsessive-compulsive disorders	10.2	2.2

3.3 Results: longer lifespan means longer "health span" too

The GBD provides support for the theory that people in the high-income, low-mortality populations of the Established Market Economies not only live longer, but remain healthier for longer too. In recent years, researchers have been divided between those who say that ill health is "compressed" into the last few years of life in these populations, and those who argue that longer life merely exposes people to a longer period of poor health. The new results suggest that older people in the developed world are healthier than their counterparts in developing countries (Figure 11).

They found that babies born in Sub-Saharan Africa can expect to spend about 15 per cent of their lifespan disabled, compared with just 8 per cent for babies born in the Established Market Economies. A 60 year-old in Sub-Saharan Africa can expect to spend about half his or her remaining years with a disability, whereas a 60 year-old in the Established Market Economies is likely to spend just one-fifth of those years disabled. These results suggest that the proportion of the lifespan lived with a disability falls as life expectancy rises.

Figure 11 Proportion of expected remaining lifespan at age 60 that will be lived disabled, by region.

Vol 1 p 232