Global burden of schizophrenia in the year 2000: Version 1 estimates

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1. Introduction

Schizophrenia is a severe mental disorder which usually starts in adolescence or early adult life and often has a chronic disabling course. It is characterized in general by fundamental and characteristics distortions in form and content of thinking and perception (loosening of associations, delusions, and hallucinations), mood (flattened, inappropriate, or blunted affect) and behavior (bizarre, apparently purposeless and stereotyped activity or inactivity). The signs and symptoms are diverse, encompassing almost every aspect of cognition and behavior and are generally characterized as positive or negative. Positive symptoms are those that are brought on by the disorder (e.g. hallucinations, delusions) while those qualities taken away by the illness (e.g. one's drive and motivation are gone) are referred to as negative symptoms.

Schizophrenia was estimated to be the 10th leading cause of non-fatal burden in the world in 1990, accounting for 2.6% of total YLD, around the same percentage as congenital malformations (1). In the Version 1 estimates for the Global Burden of Disease 2000 study, published in the World Health Report 2001 (2), schizophrenia is the 7th leading cause of YLDs at global level, accounting for 2.8% of total global YLDs. This draft paper summarises the data and methods used to produce the Version 1 estimates of schizophrenia burden for the year 2000. It will be replaced by a more complete and final paper within a few months, when the Version 2 estimates are finalised.

2. Case and sequelae definitions

The case definition and sequelae used for schizophrenia are given in Table 1 below.

Table 1. Case and sequelae definitions for schizophrenia

Cause category	GBD 2000 Code	ICD 9 codes	ICD 10 codes
Schizophrenia	U084		F20

Sequela	Definition
Treated	ICD-10 criteria.
Untreated	

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3. Disease model

The disease model for schizophrenia was based on evidence from the literature which indicates low remission rates over long periods. This differs from the approach adopted in the GBD 1990 study which assumed no remission. Table 2 summarizes the disease model for schizophrenia. Assumptions are contrasted with those of the GBD 1990 model in Table 3.

Table 2. Disease model assumptions

Definitions	ICD-10No changes in case definition from the one used in the 1999 estimates. The need to take in account new data that show that there is a different remission rate in developing countries as compared to developed countries was suggested by the Mental Health Program within WHO. Following this recommendation, changes were made on the disease model but not in the case definition
Incidence/Prevalence	Incidence rates from prevalence, RR and RRm with Dismod II
Age at onset	Male 18-25, female 26-45
Severity distribution	-
Other assumptions	RRm= 1.4
Data	See details below

Table 3. Comparison between GBD 1990 and GBD 2000

	GBD 1990	**GBD 2000**
Prevalence	0.5%	0.5%
Age at onset	20 males, 24 females	20 males, 24 females
Remission	No remission	Developed Developing
RRM	1.1	1.1
Disability weights	0.627 for psychotic state 0.351 for treated cases	0.627 for psychotic state 0.351 for treated cases

4. Disability weights and health state descriptions

Disability weights from the Global Burden of Disease 1990 study have been used.

Table 4. Disability weights

Sequela/stage/severity level	**Disability weight**	**Health state description**
Schizophrenia Untreated	**0.627**	Being out of touch with reality as characterised by hearing voices, having strange ideas and severely impaired judgement. Often associated with being disruptive and changes in sleep and eating habits. There is a significant and consistent change in overall quality of some aspects of personal behaviour , manifest as loss of interest, aimless, idleness, a self-absorbed attitude, and social withdrawal usually resulting in a lowering of social performance.

Schizophrenia Treated	**0.351**	Some decline in interpersonal relationships, diminishing of interest. Shows changes in personal behaviour, lack of motivation, drive and energy. Has strange ideas and social withdrawal. Needs to take medicines regularly.

5. Epidemiological data

Incidence and prevalence data are summarised in Tables 5 and 6 and the assumptions about incidence and prevalence for each GBD 2000 subregion in Table 7.

Table 5. Incidence data for schizophrenia

Reference	Site	Incidence
Sartorius et al. 1986 (1)	DOSMD transcultural 1978-1980	Nuclear: 10 cases/10 000 population
Brewin et al. 1997 (2)	Nothingham 1992-1994	0.87/1000 per year
Suvisaari et al. 1999 (3)	Finland cohort 1954-1965	Males: 0.79-0.53/1000 Females: 0.58-0.41/1000

Table 6. Prevalence data for schizophrenia

Country	Site	Prevalence	Age range	Prevalence %	
				Male	Female
Netherlands (5)	Netherlands 1996	DSMIIIR Lifetime 12 month One month	All ages	 0.4 0.2 0.1	 0.3 0.2 0.2
Spain (6)	Badalona 1997	SCAN one month	18 years	0.7	0.6
Spain (7)	Formentera 1997	SCAN one month	> 15	0.3	0.65
Spain (8)	Santander 1984	Pse one month	> 17	0.9	0.3
Iceland (9)	Iceland	DIS lifetime	55-57	0.7	0.0
Iceland (10)	Iceland	DIS one month DIS one year	55-57	0.5 0.5	0.0 0.0
Canada (11)	Edmonton	DIS 6 month DIS lifetime	> 18	0.4 0.5	0.2 0.6
USA (12)	N Haven	SADS-PD point	> 18	0.9	0.0
USA (13)	ECA 5 sites	DIS one month	> 18	0.7	0.7
USA (14)	NCA	CIDI one year CIDI lifetime	15-54	0.5 0.6	0.6 0.8
Puerto Rico (15)	Puerto Rico	6 month lifetime	18-64	2.0 1.9	1.1 1.2
Mexico (16)	Mexico	PSE one month	Adults	0.7	0.71
Chile (17)	Santiago	CIDI lifetime	> 18	0.5	1.4
Taiwan (18)	Taipei	DIS lifetime	> 18	0.3	0.3

China (19)	China, 12 areas	PSE current PSE lifetime		0.4 0.4	0.7 0.7
Hong Kong (20)	Hong Kong 1993	CIDI lifetime	18-64	0.8	1.7
Korea (21)	Seoul 1990	DIS lifetime	18-65	0.4	0.3
Israel (22)	Israel 1990	SADS one year Lifetime	> 18	1.0 1.0	0.4 0.5
New Zealand (23)	Christchurch	DIS 6 month	18-64	0.0	0.3
New Zealand (24)	Christchurch	DIS lifetime	18-64	0.3	0.4

Table 7. Schizophrenia data sources and assumptions - summary

AFRO D	Data from Botswana, Ghana and Sudan consistent with data from AFRO E
AFRO E	AFRO E prevalence data from Kebede D (0.2 male and 0.3 female per 100 population. Consistent with (Ben-Towin and Cushnie 1986) and Awas et al 1999: age adjusted 0.4 - 0.53%
AMRO A	Data from Kessler used in the USBoD (provided by C Michaud)
AMRO B	Prev from Caraveo et al : 0.7 adults (Mexico)
AMRO D	Data from AMRO D
EMRO B	Prevalence from MEC in GBD 1990
EMRO D	Prevalence from MEC in GBD 1990
EURO A	Data from UK, Ireland, Croatia, Spain, Holland, Germany, Denmark, Sweden., Norway, Iceland, Czech Republic, Finland
EURO B1	Prevalence from Yugoslavia and Bulgaria
EURO B2	Data from Russia
EURO C	Data from Russia
SEARO B	Data from Sri Lanka
SEARO D	Data from Nepal and india
WPRO A	Data from Australia, New Zealand and Japan
WPRO B1	Prevalence data sent to us (Prof. Shen personal communication Nov 2000) from the 1993 survey. Also Taiwan, Hon Kong and Korea
WPRO B2	Data from WPRO B1
WPRO B3	Data from Tonga

6. Incidence, prevalence and mortality estimates for 2000

Table 8. Schizophrenia: age-standardized incidence, prevalence and mortality rate estimates for WHO epidemiological subregions, 2000.

	Age-std. Incidence/100,000		Age-std. prevalence/100,000		Age-std. mortality/100,000	
Subregion	**Males**	**Females**	**Males**	**Females**	**Males**	**Females**
AFRO D	18.3	20.7	343	378	0.4	0.0
AFRO E	19.8	24.3	349	418	0.5	0.0
AMRO A	15.5	14.1	463	421	0.1	0.1
AMRO B	22.0	23.8	433	457	0.1	0.1
AMRO D	22.0	23.8	433	457	0.0	0.0
EMRO B	22.3	25.2	440	469	1.1	0.3
EMRO D	22.3	25.2	440	469	0.6	0.6
EURO A	15.0	13.8	467	435	0.1	0.1
EURO B1	18.2	19.3	508	527	0.2	0.2
EURO B2	22.3	22.0	440	469	**0.0**	**0.0**
EURO C	15.7	14.8	431	439	0.0	0.0
SEARO B	25.8	26.4	488	485	0.6	0.5
SEARO D	17.8	21.5	349	403	0.5	0.9
WPRO A	16.2	13.6	544	418	0.1	0.1
WPRO B1	20.9	20.4	433	395	0.3	0.3
WPRO B2	20.9	20.4	433	395	0.6	0.5
WPRO B3	20.9	20.4	433	395	0.8	0.9
World	19.3	20.3	422	423	0.3	0.3

- Age-standardized to World Standard Population (25).

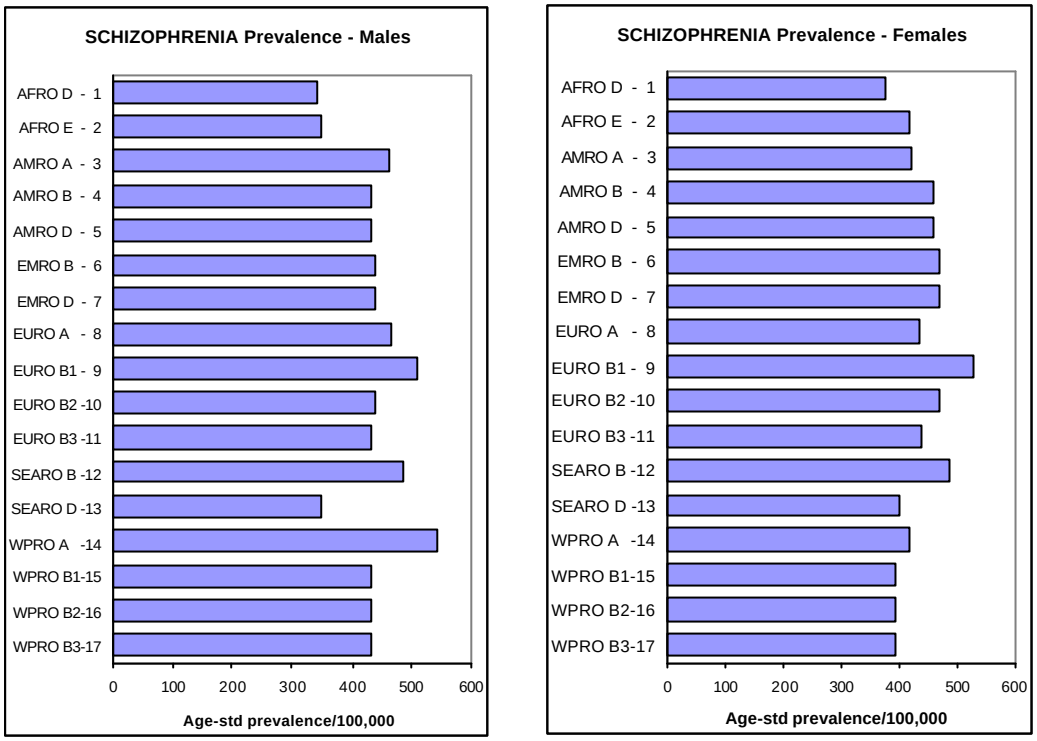


Figure 1. Age-standardized schizophrenia prevalence rate estimates, WHO epidemiological subregions, by sex, 2000.

7. Global burden of schizophrenia in 2000

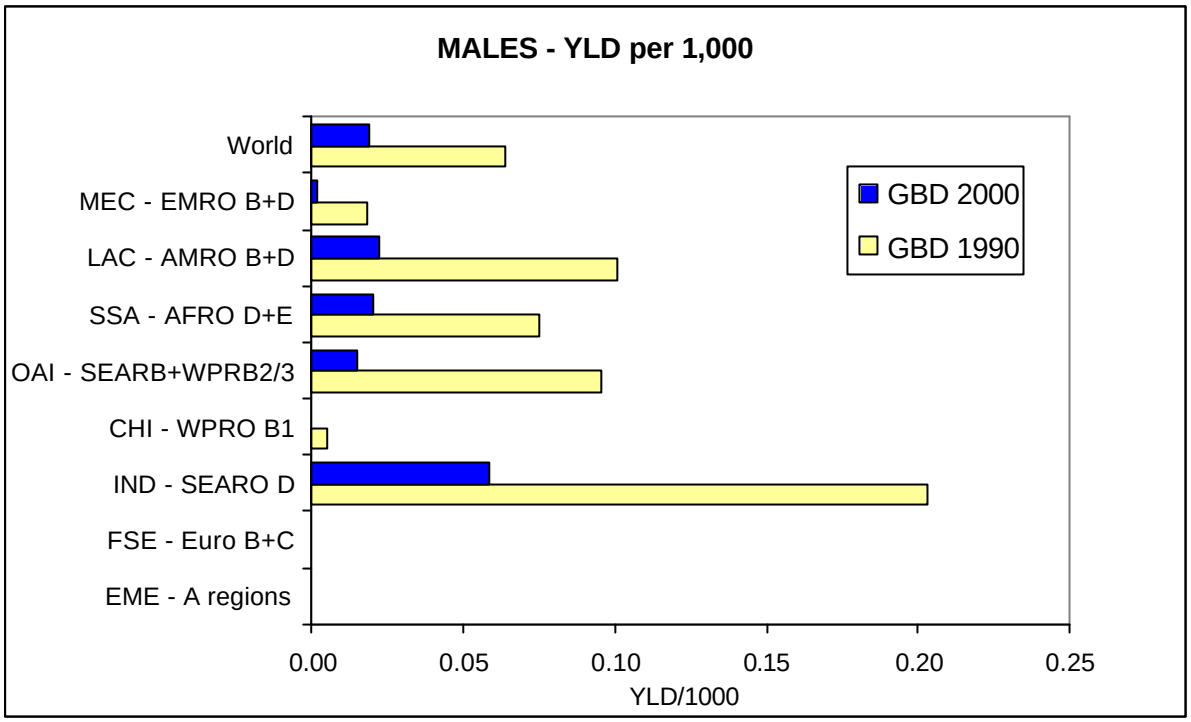
General methods used for the estimation of the global burden of disease are given elsewhere (26). The tables and graphs below summarise the global burden of schizophrenia estimates for the GBD 2000 and compare them with the schizophrenia estimates from the GBD 1990 (27).

Table 9. Schizophrenia: global total YLD, YLL and DALY estimates, 1990 and 2000.

	Males	*Females*	*Persons*
YLD('000)			
GBD1990	6,397	5,786	12,183
GBD2000	7,873	7,554	15,427
YLL('000)			
GBD1990	384	230	615
GBD2000	144	119	263
DALY('000)			
GBD1990	6,781	6,017	12,798
GBD2000	8,017	7,672	15,690

Table 10. Schizophrenia: YLD, YLL and DALY estimates for WHO epidemiological subregions, 2000.

	YLD/100,000		YLL/100,000		YLD	YLL	DALY
Subregion	**Males**	**Females**	**Males**	**Females**	**('000)**	**('000)**	**('000)**
AFRO D	250	246	2.4	0.9	**828**	6	**834**
AFRO E	237	249	2.9	1.3	**820**	7	**827**
AMRO A	166	143	1.3	0.9	**478**	3	**481**
AMRO B	276	286	1.4	0.8	**1,244**	5	**1,249**
AMRO D	284	286	0.2	0.0	**203**	0	**204**
EMRO B	314	314	15.4	5.9	**438**	15	**453**
EMRO D	311	298	4.2	3.2	**421**	5	**426**
EURO A	154	134	1.5	1.3	**590**	6	**595**
EURO B1	249	239	3.7	2.7	**405**	5	**410**
EURO B2	304	280	**0.0**	**0.0**	**149**	-	**149**
EURO C	189	168	0.7	0.4	**436**	1	**437**
SEARO B	351	346	11.4	11.0	**1,375**	44	**1,420**
SEARO D	261	285	5.1	4.7	**3,680**	66	**3,746**
WPRO A	162	133	2.5	1.5	**220**	3	**223**
WPRO B1	283	258	6.1	6.3	**3,675**	84	**3,759**
WPRO B2	336	289	9.2	6.9	**443**	11	**455**
WPRO B3	325	284	16.6	18.1	**21**	1	**22**
World	259	252	4.7	4.0	15,427	263	15,690



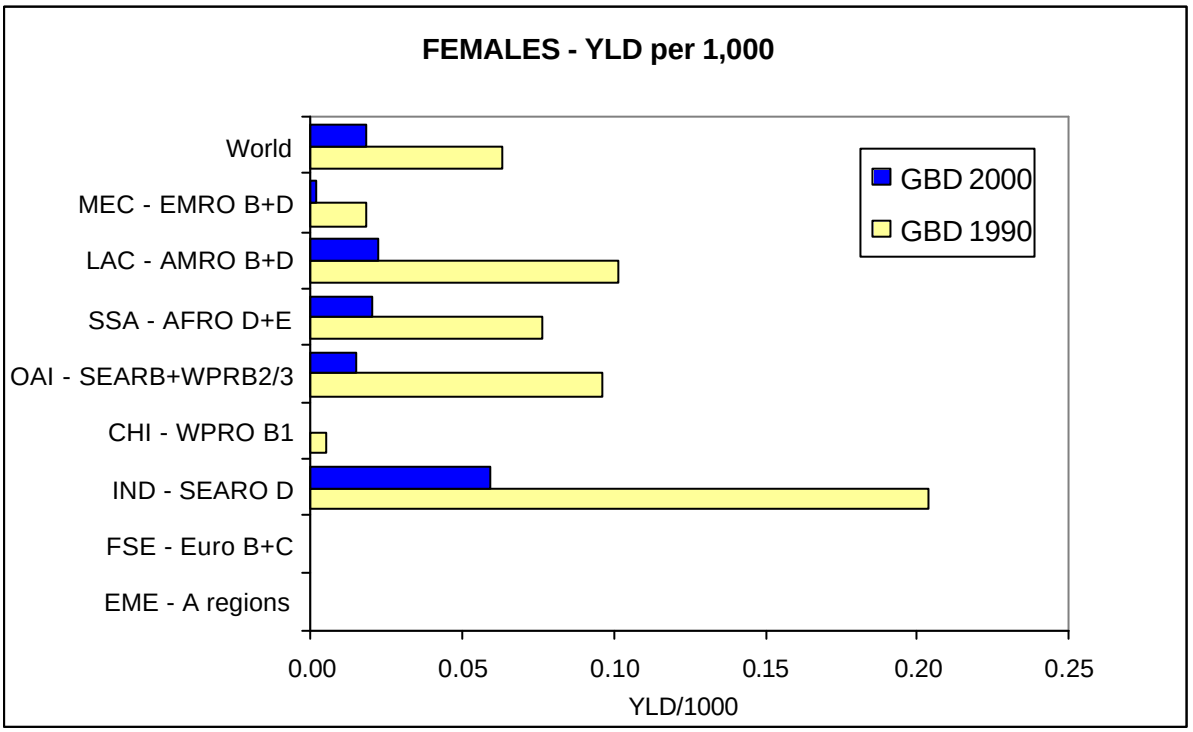


Figure 2. Total YLD rates, by sex, broad regions, 1990 and 2000.

8. Uncertainty analysis

General methods for uncertainty analysis of estimates for the Global Burden of Disease 2000 are outlined elsewhere (28). Uncertainty analysis for schizophrenia estimates has not yet been completed.

9. Conclusions

These are version 2 estimates for the GBD 2000. Apart from the uncertainty analysis, updating estimates to reflect revisions of mortality estimates and any new or revised epidemiological data or evidence, it is not intended to undertake any major addition revision of these estimates.

We welcome comments and criticisms of these draft estimates, and information on additional sources of data and evidence. Please contact Colin Mathers (EBD/GPE) on email mathersc@who.ch

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