

Global burden of HIV/AIDS in the year 2000

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1. Introduction

HIV/AIDS was the 30th leading cause of death and the 28th leading cause of disability-adjusted life years (DALYs) globally in 1990.¹ In the Version 1 estimates of the global burden of disease in 2000 reported in the World Health Report 2001, HIV/AIDS had become the 4th leading causes of death and the 3rd leading cause of DALYs.²

This draft paper summarises the data and methods used to produce the Version 2 estimates of HIV/AIDS burden for the year 2000. Detailed descriptions of the methods used to derive country-specific estimates of HIV/AIDS burden are available elsewhere.^{3,4}

2. Case and sequelae definitions

The disease model for HIV/AIDS includes HIV cases and cases of clinical AIDS.

Table 1. Case and sequelae definitions for HIV/AIDS

| Cause category | GBD 2000 Code | ICD 9 codes | ICD 10 codes |
|----------------|---------------|-------------------------|--------------|
| HIV/AIDS | W009 | No ICD-9 code available | B20-B24 |

| Sequela | Definition |
|------------|--------------------------|
| HIV Cases | |
| AIDS Cases | WHO AIDS case definition |

ⁱ Epidemiology and Burden of Disease, WHO (EIP/GPE/EBD)

3. Disability weights and health state descriptions

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

Table 2. Disability weights

| Sequela/stage/severity level | Age group (years) | | | | |
|------------------------------|-------------------|-------|-------|-------|-------|
| | 0-4 | 5-14 | 15-44 | 45-59 | 70+ |
| Cases | 0.123 | 0.123 | 0.136 | 0.136 | 0.136 |
| AIDS | 0.505 | 0.505 | 0.505 | 0.505 | 0.505 |

4. Epidemiological data

Country-specific estimates of HIV and AIDS have been developed by UNAIDS and WHO and revised periodically to account for new data and improved methods.³ For the most recent round of estimates, two different types of models have been used depending on the nature of the epidemic in a particular country. For generalized epidemics, in which infection is spread primarily through heterosexual contact, a simple epidemiologic model was used to estimate epidemic curves based on sentinel surveillance data on HIV sero-prevalence.⁴ For countries with epidemics concentrated in high-risk groups, prevalence estimates were derived from the estimated population size and prevalence surveillance data in each high-risk category, and simple models were then used to back-calculate incidence based on these estimated prevalence trends.⁵

Where available and reliable, vital registration data have been used as the basis for estimates of AIDS mortality.

5. Incidence, prevalence and mortality estimates for 2000

Table 4. Age-standardized incidence, prevalence and mortality rate estimates for HIV/AIDS, WHO epidemiological subregions, 2000.

| Subregion | Age-std. Incidence/100,000 | | Age-std. prevalence/100,000 | | Age-std. mortality/100,000 | |
|--------------|----------------------------|--------------|-----------------------------|--------------|----------------------------|-------------|
| | Males | Females | Males | Females | Males | Females |
| AFRO D | 392.7 | 404.9 | 1819.8 | 1919.8 | 195.3 | 194.4 |
| AFRO E | 1368.1 | 1491.4 | 6611.4 | 7714.0 | 662.1 | 657.1 |
| AMRO A | 37.9 | 9.3 | 535.6 | 137.5 | 6.7 | 2.1 |
| AMRO B | 64.8 | 22.3 | 452.7 | 155.8 | 12.0 | 4.0 |
| AMRO D | 176.4 | 73.1 | 780.1 | 348.6 | 58.5 | 18.7 |
| EMRO B | 1.8 | 0.2 | 19.1 | 2.2 | 0.0 | 0.0 |
| EMRO D | 1.8 | 0.2 | 19.4 | 2.2 | 0.0 | 0.0 |
| EURO A | 11.0 | 3.6 | 205.2 | 71.0 | 3.7 | 0.9 |
| EURO B1 | 3.5 | 0.6 | 27.4 | 4.3 | 0.6 | 0.3 |
| EURO B2 | 1.3 | 0.3 | 4.5 | 1.2 | 1.1 | 0.2 |
| EURO C | 80.7 | 30.8 | 251.3 | 96.9 | 6.3 | 1.4 |
| SEARO B | 44.7 | 22.6 | 304.9 | 178.3 | 14.3 | 5.4 |
| SEARO D | 89.5 | 44.9 | 385.5 | 229.9 | 29.5 | 16.0 |
| WPRO A | 1.5 | 0.2 | 32.9 | 3.9 | 0.4 | 0.0 |
| WPRO B1 | 17.8 | 3.2 | 64.0 | 10.8 | 1.5 | 0.5 |
| WPRO B2 | 162.0 | 70.6 | 890.2 | 411.5 | 59.2 | 18.4 |
| WPRO B3 | 43.0 | 21.5 | 149.4 | 103.5 | 16.8 | 5.6 |
| World | 129.7 | 120.6 | 630.5 | 592.8 | 49.4 | 47.9 |

- Age-standardized to World Standard Population (3).

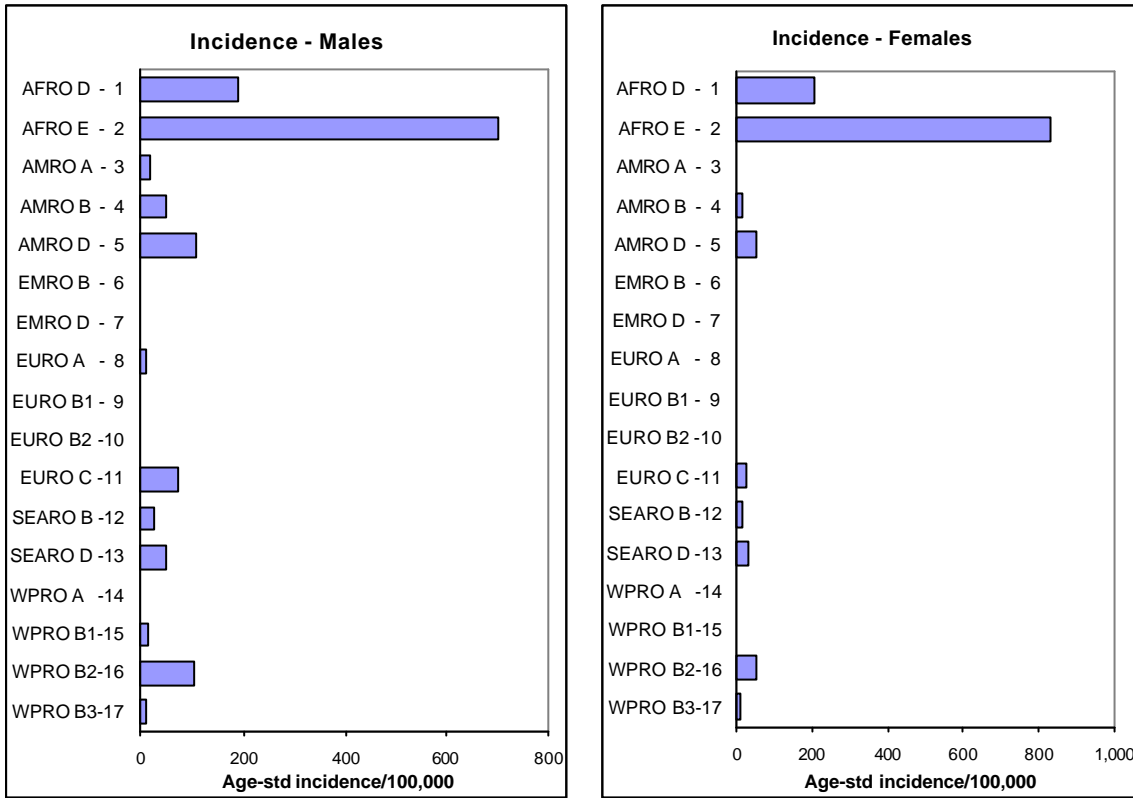


Figure 1. Age-standardized HIV incidence rate estimates, WHO epidemiological subregions, by sex, 2000.

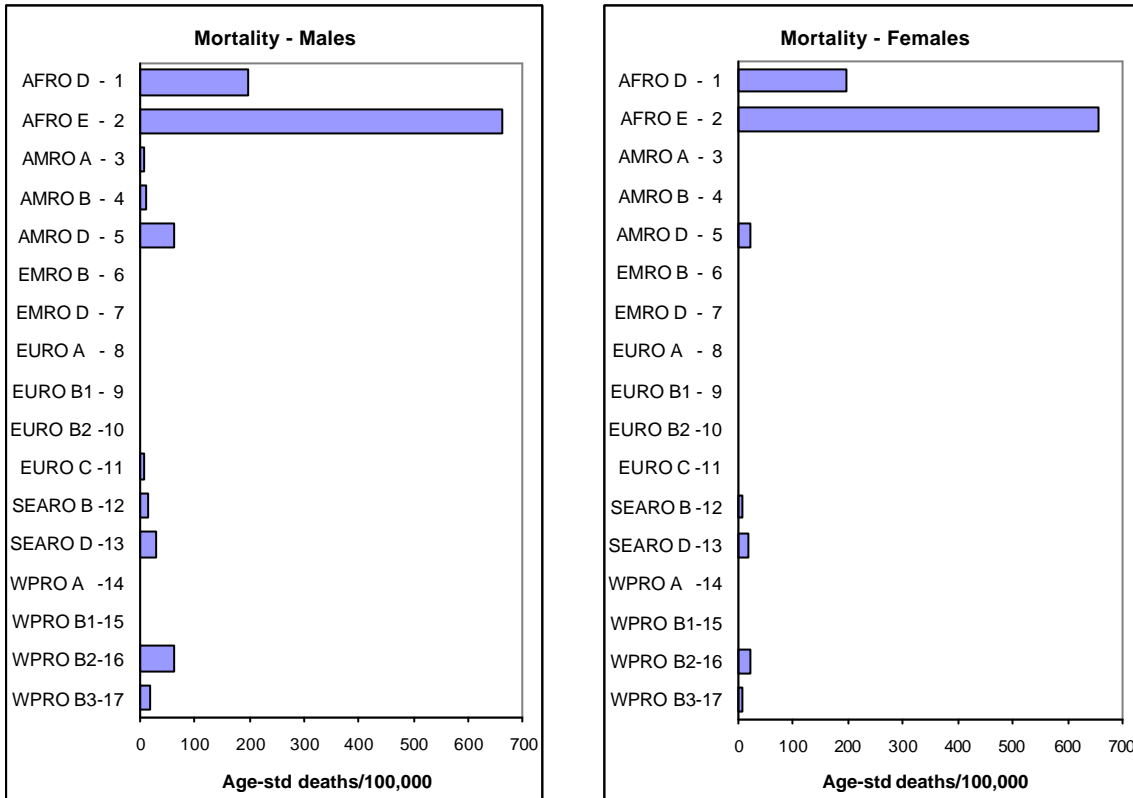


Figure 2. Age-standardized AIDS mortality rate estimates, WHO epidemiological subregions, by sex, 2000.

6. Global burden of HIV/AIDS in 2000

General methods used for the estimation of the global burden of disease are given elsewhere.¹ The tables and graphs below summarise the global burden of HIV/AIDS estimates for the GBD 2000 and compare them with the HIV/AIDS estimates from the GBD 1990.

Table 6. Global total YLD, YLL and DALY estimates for HIV/AIDS, 1990 and 2000.

| | <i>Males</i> | <i>Females</i> | <i>Persons</i> |
|-------------------|--------------|----------------|----------------|
| YLD('000) | | | |
| <i>GBD1990</i> | 1,423 | 917 | 2340 |
| <i>GBD2000</i> | 4,341 | 3,866 | 8,207 |
| YLL('000) | | | |
| <i>GBD1990</i> | 4,709 | 4,123 | 8,832 |
| <i>GBD2000</i> | 39,988 | 42,140 | 82,128 |
| DALY('000) | | | |
| <i>GBD1990</i> | 6,132 | 5,040 | 11,172 |
| <i>GBD2000</i> | 44,329 | 46,006 | 90,335 |

Table 7. YLD, YLL and DALY estimates for HIV/AIDS, WHO epidemiological subregions, 2000.

| Subregion | YLD/100,000 | | YLL/100,000 | | YLD | YLL | DALY |
|------------------|--------------------|----------------|--------------------|----------------|---------------|---------------|---------------|
| | Males | Females | Males | Females | ('000) | ('000) | ('000) |
| AFRO D | 338.4 | 385.2 | 4329.1 | 5173.8 | 1,208 | 15,871 | 17,080 |
| AFRO E | 1193.5 | 1467.0 | 14250.5 | 16851.7 | 4,493 | 52,519 | 57,012 |
| AMRO A | 86.2 | 19.2 | 162.1 | 52.4 | 162 | 330 | 491 |
| AMRO B | 98.0 | 33.6 | 285.8 | 106.6 | 290 | 864 | 1,154 |
| AMRO D | 191.0 | 86.8 | 1260.9 | 466.4 | 99 | 615 | 714 |
| EMRO B | 2.9 | 0.3 | 0.0 | 0.0 | 2 | 0 | 2 |
| EMRO D | 2.6 | 0.3 | 0.0 | 0.0 | 2 | 0 | 2 |
| EURO A | 23.5 | 6.8 | 97.5 | 23.6 | 61 | 245 | 307 |
| EURO B1 | 5.3 | 0.9 | 17.2 | 9.7 | 5 | 22 | 27 |
| EURO B2 | 1.6 | 0.4 | 24.8 | 6.3 | 0 | 8 | 8 |
| EURO C | 112.3 | 37.1 | 169.8 | 35.8 | 178 | 242 | 420 |
| SEARO B | 68.0 | 35.6 | 394.0 | 169.3 | 204 | 1,111 | 1,315 |
| SEARO D | 95.9 | 53.0 | 707.0 | 518.9 | 1,012 | 8,304 | 9,317 |
| WPRO A | 3.0 | 0.4 | 8.5 | 0.5 | 3 | 7 | 9 |
| WPRO B1 | 28.2 | 4.9 | 42.7 | 16.2 | 229 | 405 | 634 |
| WPRO B2 | 250.3 | 109.5 | 1632.2 | 579.1 | 254 | 1,563 | 1,817 |

| | | | | | | | |
|--------------|--------------|--------------|---------------|---------------|--------------|---------------|---------------|
| WPRO B3 | 57.3 | 30.5 | 444.1 | 169.2 | 3 | 21 | 24 |
| World | 142.6 | 128.8 | 1313.6 | 1404.4 | 8,207 | 82,128 | 90,335 |

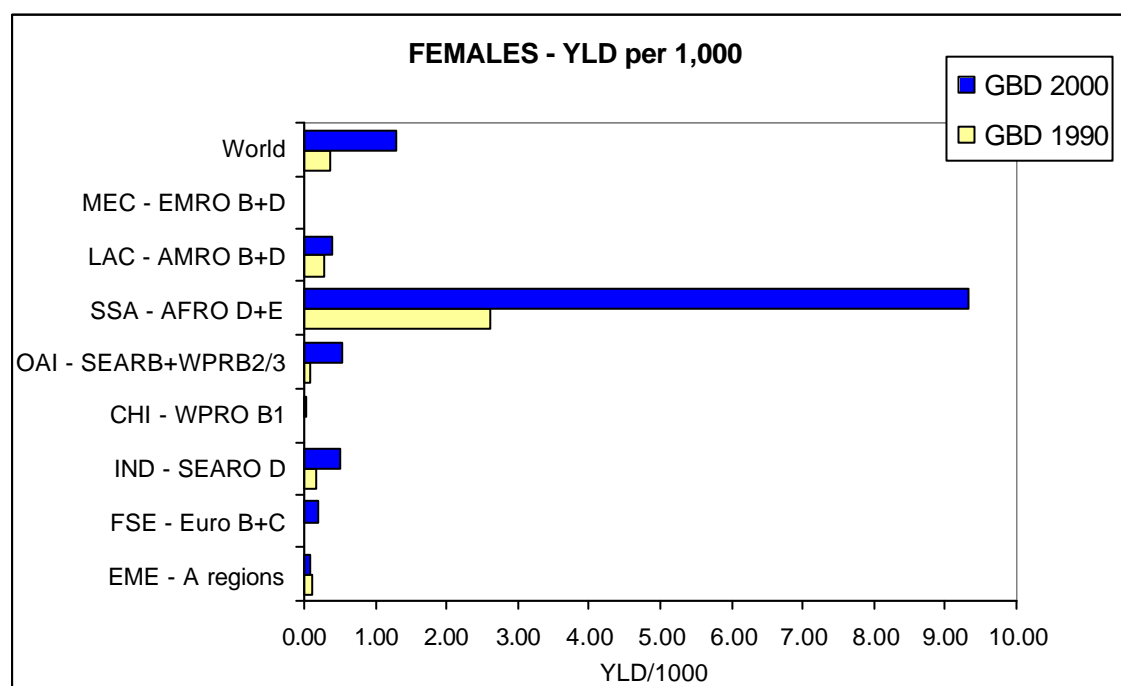
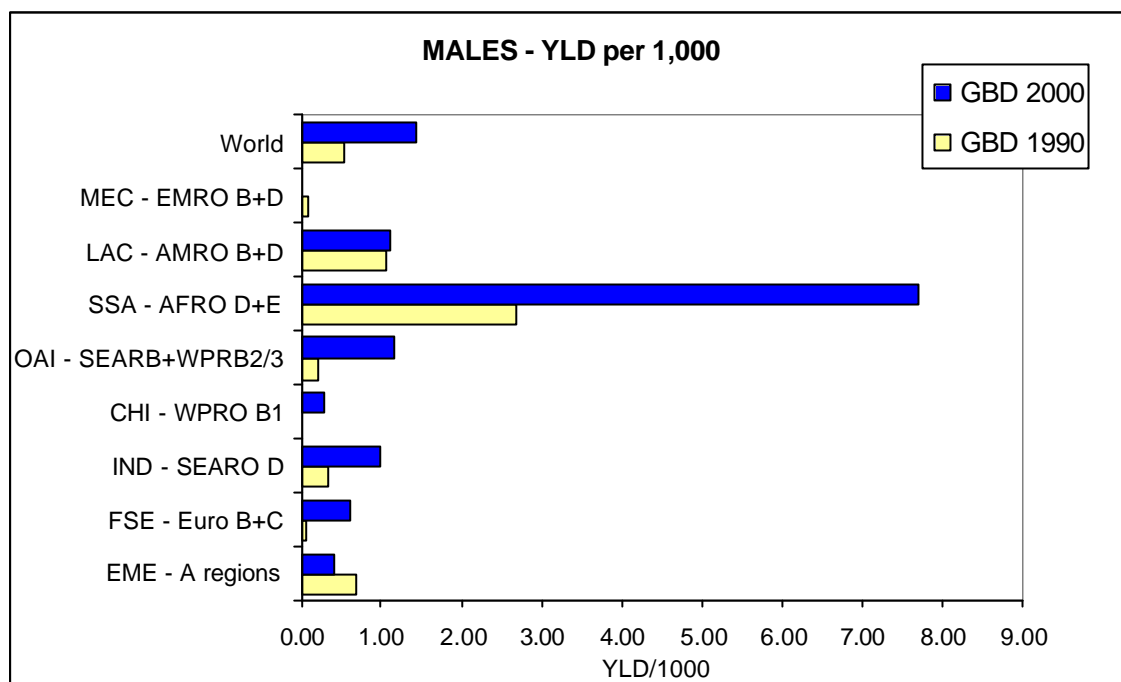


Figure 4. Total YLD rates, by sex, broad regions, 1990 and 2000.

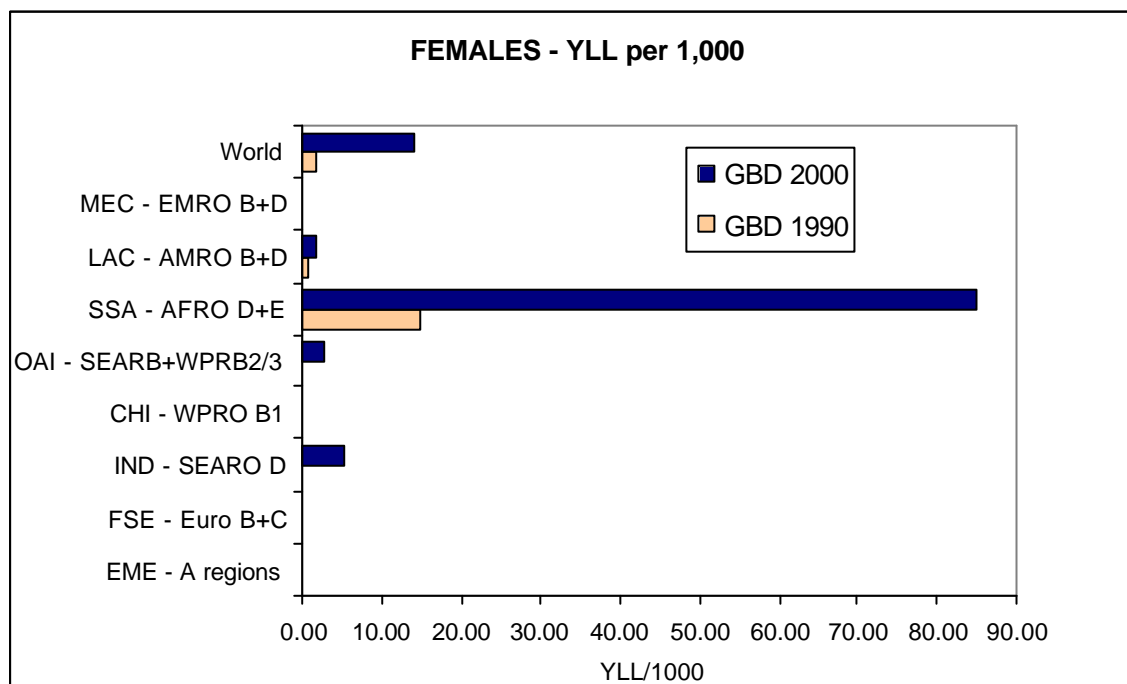
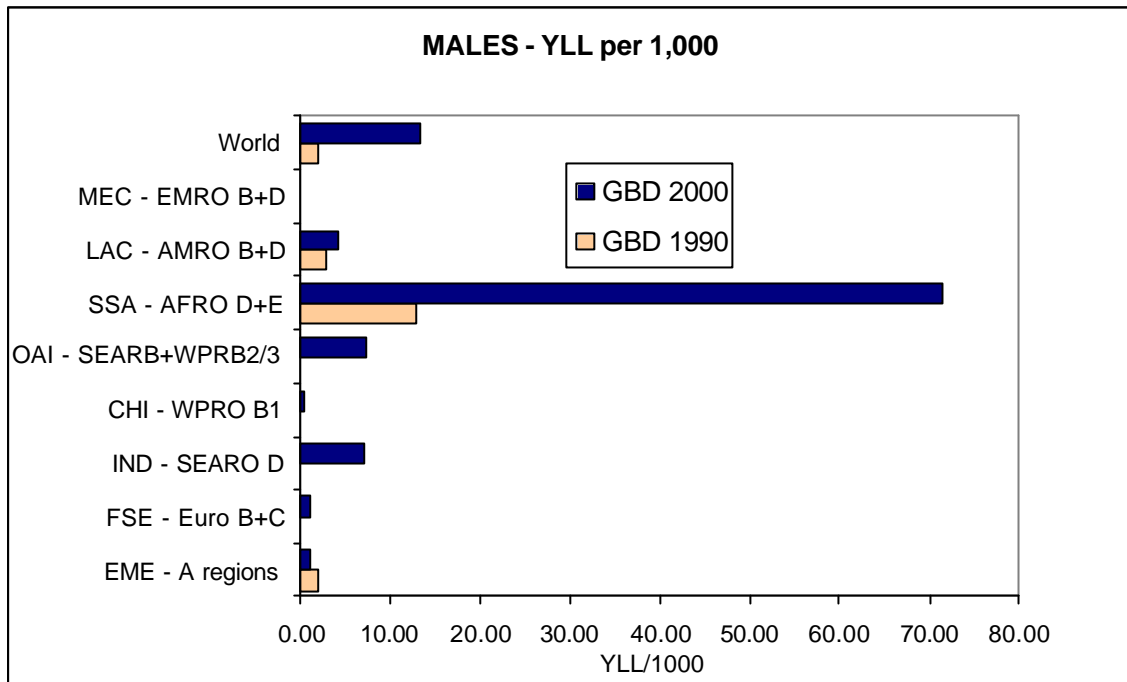


Figure 5. Total YLL rates, by sex, broad regions, 1990 and 2000.

7. Uncertainty analysis

General methods for uncertainty analysis of estimates for the Global Burden of Disease 2000 are outlined elsewhere.⁶ Uncertainty analysis for HIV/AIDS estimates has not yet been completed.

8. 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.

Acknowledgements

The country-specific estimates of HIV/AIDS incidence and mortality that were the basis for the burden calculations described here were prepared by N. Walker and colleagues in UNAIDS, in collaboration with others in WHO.

9. References

- (1) Murray CJL, Lopez AD. *The global burden of disease: a comprehensive assessment of mortality and disability from diseases, injuries and risk factors in 1990 and projected to 2020*. Cambridge: Harvard University Press, 1996.
- (2) *World Health Report 2001. Mental Health: New Understanding, New Hope*. Geneva: World Health Organization, 2001.
- (3) Schwartlander B, Stanecki KA, Brown T et al. Country-specific estimates and models of HIV and AIDS: methods and limitations. *AIDS* 1999; 13(17):2445-2458.
- (4) Improved methods and assumptions for estimation of the HIV/AIDS epidemic and its impact: Recommendations of the UNAIDS Reference Group on Estimates, Modelling and Projections. *AIDS* 2002; 16(9):W1-14.
- (5) Stover J, Walker N, Garnett GP et al. Can we reverse the HIV/AIDS pandemic with an expanded response? *Lancet* 2002; 360(9326):73-77.
- (6) Salomon JA, Mathers CD, Murray CJL, Ferguson BD. *Methods for life expectancy and healthy life expectancy uncertainty analysis (GPE Discussion Paper No. 10)*. Geneva: World Health Organization, 2001.