Technical report on improving estimates and projections of HIV/AIDS

Based on a meeting of the UNAIDS/WHO Reference Group for "Estimates, Modelling and Projections" held at Sintra, Portugal, December 2-4th 2003

UNAIDS/WHO

Introduction

The Joint United Nations Programme on HIV/AIDS and World Health Organisation (UNAIDS/WHO) Reference Group on "Estimates, Modelling and Projections" exists to provide impartial scientific advice to UNAIDS and WHO on global estimates and projections of the prevalence, incidence and impact of HIV/AIDS. The Reference Group acts as an 'open cohort' of epidemiologists, demographers, statisticians, and public health experts. It is able to provides timely advice and also address ongoing concerns through both *ad hoc* and regular meetings. The group is co-ordinated by a secretariat based in the Department of Infectious Disease Epidemiology, Imperial College London (www.epidem.org).

The Reference Group meeting in Sintra brought together 28 experts from 10 countries to focus on improving estimates of HIV/AIDS in low level and concentrated epidemics and in generalised heterosexual epidemics. A major focus of this meeting was the need to better estimate the uncertainty in estimates of HIV prevalence, incidence and AIDS mortality and orphanhood. In the past UNAIDS/WHO have provided a range about estimates based on a review of the quality of the surveillance data in different countries (Walker and others, 2001). In countries with good surveillance data the range on adult prevalence was plus/minus 20% of the value, while for countries with poor surveillance the range increased up to 35%. The size of the intervals about the estimates has been based on expert judgement. In late 2003 two working group meetings were therefore held to attempt a more systematic approach to estimate expected statistical confidence in estimates and additional biases less amenable to statistical analysis. The need for such estimates has been highlighted by the apparent discrepancy between some population prevalence surveys in sub-Saharan Africa and estimates based on testing pregnant women at antenatal clinics (ANC). It should be noted, however, that there does not appear to be any systematic bias in estimates of AIDS mortality produced by UNAIDS/WHO as evidenced by comparison with household survey data on the fraction of children orphaned in 36 countries in sub-Saharan Africa (Grassly and others, 2004).

The meeting also focused on the impact of antiviral therapy on survival and the potential impact of widespread programs for the prevention of mother-to-child transmission on ANC-based surveillance. Methods to estimate the number of people in need of antiviral drugs were reviewed, and the impact of widespread treatment on prevalence discussed. As part of this process a review of studies reporting survival from AIDS diagnosis or CD4 levels <200 mm^{-3} in the absence of treatment was commissioned from the Department for Social and Preventive Medicine at the University of Berne and presented by Marcel Zwahlen. The Reference Group also reviewed data in adult and child mortality due to AIDS and other causes to ensure life tables and survival curves used by UNAIDS/WHO are appropriate.

Two working groups at the meeting focused on producing recommendations for estimates in countries with low-level or concentrated epidemics and with generalised heterosexual epidemics. Recommendations were sought on four major topics: 1) intervals about estimates, 2) epidemic curve estimation, 3) presentation of trends in prevalence in UNAIDS/WHO Global Report, 4) estimates of prevalence among young people (15-24 yr olds). These recommendations were based on discussion following on from the presentations given at the meeting (see Agenda reproduced at the end of this report).

The Reference Group remains an informal network and relies on the generosity and enthusiasm of its members in committing time and resources in both developing and responding to an active research agenda. It is thanks to them that UNAIDS/WHO can provide the best possible estimates for HIV/AIDS.

Progress

Since the last Reference Group meeting in Madrid at the end of 2002, UNAIDS and the WHO have held 12 regional workshops for all countries for which HIV/AIDS estimates are produced. This has been a major achievement, highlighting the importance of working closely with countries and providing a great opportunity to build country capacity to produce estimates. Importantly they have resulted in revised and improved estimates of HIV prevalence and AIDS mortality through the integration of information from different sources, particularly the Ministries of Health and the Offices for National Statistics. National workshops, sometimes with the support of UNAIDS, have followed, and in addition to the revision of estimates, have helped raise awareness of the importance of HIV/AIDS care and prevention.

Central to the regional workshops has been the provision of software to help produce estimates. This has included the Epidemic Projection Package (EPP) for generalised epidemics and Excel® workbooks for countries with concentrated epidemics. The development and testing of this software is a key role of the Reference Group.

Transparency in the methods and data used to produce statistics on HIV/AIDS is a key concern of UNAIDS/WHO and the Reference Group. In the past, papers on the methods used for the biennial country-specific estimates published in the 'Report on the Global HIV/AIDS Epidemic' have been published in peer reviewed scientific journals (Schwartländer and others, 1999; UNAIDS Reference Group on Estimates Modelling and Projections, 2002; Walker and others, 2003). In 2004 a special issue of *Sexually Transmitted Infections* will contain a series of papers on the methods and data used by UNAIDS/WHO to produce the HIV/AIDS statistics for the end of 2003. This is due to be published prior to the International AIDS Conference in Bangkok, July 2004. Additionally the papers of this special issue together with the software produced by UNAIDS/WHO will be distributed on CD-ROM at the Conference.

Deriving intervals about HIV/AIDS estimates to indicate their accuracy and inform comparisons with other estimates has been a major focus for the Reference Group at the end of 2003. A paper describing methods to derive 'plausibility bounds' about estimates for generalised and concentrated epidemics will be published in the special issue of *Sexually Transmitted Infections*.

Specific recommendations from the Reference Group meeting held in Madrid in December 2002 were published in tabular format in the report from that meeting. We use a similar format below to show how each of these recommendations have been implemented. (Tables 1 & 2). We then produce in the same format recommendations from the Reference Group meeting in Sintra, December 2003 for countries with generalised epidemics (Table 3) and countries where HIV is concentrated among certain high risk groups (Table 4).

Table 1 Recommendations from the Reference Group Meeting in December 2002 and action taken during 2003 to respond to these recommendations: Low-level and concentrated epidemics

Recommendations*	Who responsible?	Timeframe* 2m	6m	1yr	Action
Two kinds of training should be planned by UNAIDS: generalised and low/concentrated epidemics - Countries should be trained in methods appropriate to their transmission patterns rather than in methods decided by numerical proxies based on prevalence levels. - Training should include population size estimation	UNAIDS with inputs from Futures Group		▓		Training of Trainers in Geneva 3-5th March 2003 included these recommendations. Twelve regional workshops were held in 2003 allowed UNAIDS/WHO to work with all countries in producing the best possible estimates and projections of HIV prevalence. Workshops were based around a spreadsheet model for countries with concentrated epidemics and EPP for countries with generalised heterosexual epidemics. Population size estimation was discussed and implemented as far as possible in the time of the workshop. In some cases this led to significant revision of country-specific estimates
Spreadsheet method based on exposure categories and seroprevalence surveys is the recommended method for prevalence estimation in low/concentrated epidemics - Even if data are not available for specific groups, they should be defined in the spread sheet to highlight gaps and assist in programming - Users of spreadsheet method must document procedures, assumptions, and calculations - Spreadsheet results need to be cross checked against a general population surrogate, for the purpose of assessing the size of the residual population not covered by exposure subgroups	UNAIDS with inputs from Futures Group		▓		Implemented by UNAIDS and Futures Group, and available for Training of Trainers in Geneva 3-5th March 2003. Spreadsheets revised based on comments from this meeting.
Recommendations for data review by UNAIDS (all to be done with regional breakdowns)					
o prevalence saturation levels in different risk groups with clear definitions of appropriate denominators to which they apply	Neff Walker & UNAIDS	▓			Draft table produced by Neff Walker.
o rates of people moving in and out of exposure groups and the effect on estimates	FHI and IDU-UNAIDS Ref. Group	▓			Ongoing. Meeting planned for May 10-12 2004.
o overlapping risk populations – move towards creation of database with common behavioural indicators related to the transmission of HIV and overlap of risk behaviours, including details of populations sampled and their sizes with respect to total adult population numbers	FHI, USAID and possibly others				Problem of non-comparability of behavioural surveys and questions due to differences in implementation. Tobi Saidel made clear the role of behavioural surveillance and how comparability is inevitably limited at an ad hoc meeting of the WHO HIV/AIDS surveillance working group on the 6th March. Some indicators are reasonably comparable and some of these will be included in the HIV/AIDS database being put together by Measure DHS. (MICS and DHS behavioural data are currently included)
o age and gender patterns of HIV prevalence within high risk groups	?to be identified		▓	▓	Roeland Monasch and Neff Walker have completed this review, which will be presented at a meeting on May 10-12 2004.
Review approach to estimates of orphan numbers in countries with concentrated epidemics with focus on fertility estimates among high risk groups and the impact of HIV – possible use of STI prevalence as a proxy	IDU-UNAIDS Ref Group on IDU, WHO/UNAIDS on MSM, lit search for SW	▓			Lack of fertility data together with variation in age and sex distribution of infections means that UNAIDS will not produce AIDS orphan estimates for these countries. Orphans due to causes other than AIDS will dominate orphan numbers and will be produced as for other countries.

Additional recommendations:

Ways of generating and presenting intervals about estimates and projections for low-level and concentrated epidemics are needed	UNAIDS Reference Group			Following two meetings at the end of 2003 an approach to generate plausibility bounds around estimates has been derived. This approach is described in a paper that is part of the series to be published by the journal Sexually Transmitted Infections on the methods used by UNAIDS and WHO to produce HIV/AIDS estimates.

*General recommendations requiring no further action are not reproduced here and the reader is referred to the report from the December 2002 meeting.

Table 2 Recommendations from the Reference Group Meeting in December 2002 and action taken during 2003 to respond to these recommendations: Generalised epidemics

Recommendations	Who responsible?	Timeframe			Action
		2m	6m	1yr	
Update the chart comparing ANC prevalence 15-49 with community based surveys to include all the latest surveys. Also focus on age-breakdown of comparison with particular focus on 15-19, 20-24 and 15-24 to assist with estimates of the UNGASS indicator of prevalence among youth (15-24). These comparisons aim to improve our understanding of biological, behavioral and local attendance biases affecting ANC prevalence. a. Compile comprehensive list of sites. b. Prepare description of comparisons we want c. Invite investigators to workshop to share and compare data Potential sites include: 　i. Tanzania: Kisesa, Kigoma, Kilimanjaro 　ii. Kenya: Nairobi (CAFS), Kisumu (CDC) 　iii. South Africa: Hlabisa 　iv. Zimbabwe: Manicaland 　v. Malawi: Karonga 　vi. Uganda: Rakai, Masaka, Jinja 　vii. Cambodia	Ref Group Secretariat		▨		Reference Group secretariat has reviewed available data for ANC and population prevalence comparisons by age, presented an analysis of the ratio of ANC:population prevalence with confidence intervals and tests for consistent bias (homogeneity tests), e-mailed to reference group members and presented the work at a workshop organized by WHO in Lusaka, February 2003. Additional data should be available if investigators from past and ongoing population surveys are brought together in a meeting. This will be pursued by Ties Boerma in the WHO HIV/AIDS division and Peter Ghys (UNAIDS/CDC).
Following an update of the table of the ratio of prevalence 15-19, 20-24 and 15-24 from population surveys to ANC prevalence at same ages in the short term, assess similarity of prevalence 15-24 at ANC to prevalence 15-24 in women. If these are not significantly different, the ANC prevalence 15-24 can be used without adjustment to represent women. Male prevalence would be estimated using the average ratio of male prevalence from population surveys to ANC prevalence.	UNAIDS Secretariat, Basia Zaba, Simon Gregson, James Lewis	end Jan			Currently, of the 14 comparisons, 12 show no significant difference between ANC prevalence and female population prevalence for 15-24 year olds. However, bias in ANC representativeness will change systematically with trends in behaviour, such as contraception use, leading to incorrect identification of trends in prevalence among young women. The ratio of ANC: male population prevalence for 15-24 year olds is highly variable (1.0 to 5.8), with all but one of nine studies showing a ratio significantly greater than one. This suggests it will be difficult to present estimates of young male HIV prevalence based on age-stratified ANC data. Additionally, most sentinel sites with age-stratified prevalence data are in cities. UNAIDS is therefore most likely to present prevalence estimates for urban women aged 15-24 only.
For countries without age-specific ANC prevalence data, estimate the 15-24 prevalence using the model pattern in Spectrum. These estimates should be used to calculate regional averages but not reported in country-specific tables.	UNAIDS				

Compare Zambia DHS, Zimbabwe YAS and Dominican Republic DHS with ANC data. (Add Kenya in April? Add Mali when ANC surveillance becomes available). a. First compare relevant population clusters with nearby ANC to determine if ANC represents general population well. Do this comparison for pregnant women, when possible. b. Examine effects of different assumptions about prevalence among non-responders. c. Do comparison for total national prevalence to determine what adjustment factor for rural ANC prevalence is appropriate. d. Determine range of ratios of prevalence among 15-24 to 15-49 from population based surveys that we do have to use to adjust Zimbabwe YAS to 15-49 prevalence	Ann Way, Mike St Louis				Meeting organized by WHO in Lusaka addressed these issues. A report from this meeting is published by WHO (contact Ties Boerma).

Ask surveillance officers attending EPP training to bring characteristics of surveillance sites.
       - Develop list of characteristics to request (geocodes, census classification as urban or rural, if and when started offering PMTCT, study sites for interventions, number of pregnancies seen at each ANC site, others)
       - Are there additional ANC sites collecting prevalence data that are not used in the sentinel surveillance system?
       - Use Health Mapper to do additional analysis of ANC sentinel sites
	UNAIDS, John Stover, Tim Brown	Q. List by Feb			List finalized at Training of Trainers workshop held in Geneva 3-5th March 2003.

Analyze the detailed national estimates made for Kenya, Malawi, and Zambia that include detailed population mapping to ANC sites to determine if most of the difference between these estimates and UNAIDS approach can be eliminated by better classification by urban and rural.	John Stover				John Stover completed this analysis and was able to confirm that for Zambia reclassification of surveillance sites as urban or rural has a major influence on estimated national prevalence. In Kenya and Malawi, it has been possible to assign population catchment numbers to each surveillance site. Weighting prevalence estimates from sentinel sites by this population number can produce quite different national prevalence estimates (e.g. 8.7% vs. 11.1% estimated by UNAIDS in Kenya; 13% vs. 17% in Malawi). Adjusting rural site prevalence down using the UNAIDS approach does not adequately account for these differences. However, better estimates can be obtained if surveillance site catchment populations are carefully identified by national AIDS programme staff as urban, peri-urban and rural, and urban and peri-urban sites are used to represent the urban population and rural sites the rural population. In Kenya careful classification of sites produces a revised estimate of 8.9% (vs. 8.7% population weighted estimate) and in Malawi 12.4% (vs. 13% population weighted estimates). More careful classification of sites should therefore be a priority, and may eliminate the need for a rural adjustment factor. In Zimbabwe site reclassification resulted in a major downwards revision in the HIV/AIDS estimate from 34% to 25% adult prevalence for the end of 2001, and 25% in 2003.

Recommendation	Responsible				Comment
UNAIDS should prepare a table with a list of countries that is released at the same time as the Epi-update that contains six columns for prevalence: 1) ANC prevalence (15-49), 2) estimated female prevalence from ANC, 3) estimated male prevalence from ANC, 4) year of population survey, if available, 5) female prevalence from population survey, 6) male prevalence from population survey.	UNAIDS				Where national prevalence surveys have been completed, and data quality not at issue, this can be done.
Recommendations on EPP:					
For countries that have added new rural sites in the last few years: fit EPP curves to all data from sites with 3 or more years of data. Then calculate the ratio of the average prevalence in the last one or two years from all sites to the estimated prevalence from the EPP curve. Use this ratio to adjust each ANC data point from the original fit, re-fit the EPP curve for all years. In this case it may be necessary to adjust the rural weighting factor. Produce a list of countries where this approach is appropriate and validate method.	UNAIDS Ref Group Secretariat and Tim Brown				A new method to automatically account for changes in the number of sites over time has been derived. This method will be presented at the Sintra meeting in December.
Fit EPP to get t0, r and f0. Then try all values of phi between –1000 and 1000. Select a range based on some criteria for variation from the "best fit". For the estimate, use a value of phi that does not produce a prevalence decline if there is no significant difference between values of phi that give constant prevalence and declining prevalence. For the projection use range to indicate uncertainty in phi.	Joshua Salomon, UNAIDS Secretariat, and Tim Brown	end Jan			Uncertainty in both parameter and HIV/AIDS estimates has become a major focus of attention of the Reference Group. Meetings have been held in July and October 2003, and methods to estimate uncertainty will be presented in Sintra. This methods are described in a paper that is part of the series to be published by the journal Sexually Transmitted Infections on the methods used by UNAIDS and WHO to produce HIV/AIDS estimates.
There should be a default value in EPP (e.g., 0.8) for weighting sites outside major urban areas.	Tim Brown				Implemented. But also see note above regarding need for careful and possible re-classification of sites.
Cross-sectional/longitudinal community and population prevalence data – should not be included in the EPP fits but can be used later to validate estimates; longer term research needed into how to use them	UNAIDS Ref Group				Sensitivity of population prevalence estimates to non-response rates examined in February in Lusaka and presented in WHO report.
Present recent trends in prevalence and AIDS mortality as well as current estimates	UNAIDS				Trends to be presented.
Model changes in prevalence over time given a constant pattern of force of infection to develop typical profiles of changes in the age-pattern of prevalence over time that match existing prevalence data. Use this information to modify the default pattern in Spectrum.	UNAIDS Secretariat				Nicholas Grassly and John Stover have completed this work. The pattern has been compared to that observed in cohort studies in Masaka (Uganda), Chelston and Kapiri-Mposhi (Zambia) and Kagera (Tanzania). The peak age of infection shifts to older ages but not as rapidly as observed for the cohort studies. This suggests behaviour change towards safer sex among youth in the cohort studies. In the absence of further information about behaviour change in other countries, we have not modified the default Spectrum pattern. However, we recommend that for each country availability of prevalence or behavioural data is taken into consideration when changing the default age pattern.

Recommendation	Person				Status
Blood donor data may be useful in some countries (Tanzania) for examining trends in sex ratio and age patterns of prevalence over time. It may be useful to analyze the Tanzania data carefully and look for other countries where the blood donor data may be unbiased based on how it is collected.	Basia Zaba			▓	ongoing.
The WHO data base of AIDS case reports can be analyzed to determine trends in the sex ratio over time for more countries. Look for additional historical data on prevalence by sex to validate the use of AIDS case reports.	Ties Boerma/ WHO, John Stover	▓			Work has been completed, although the database of AIDS case reports is continually expanding. Default sex distribution assumptions in Spectrum have been updated in the light of this new data. For a mature epidemic the F:M ratio is now 1.3.
Review population and ANC data to determine if fertility adjustments should be modified. (This requires an assessment of the relative odds of inclusion in ANC samples and relative fertility in HIV+).	Simon Gregson and James Lewis	▓			Work presented in Durban at the end of March on the problems of using relative odds of inclusion in ANC samples and likely impact of HIV/AIDS on fertility and the number of children being born. No need to revise current fertility adjustments.
We should prepare recommendations for VCT and PMTCT programs regarding information they should be collecting to improve the usefulness of these data. a. Review PMTCT protocols to determine what additional questions may be needed on ANC forms. b. PMTCT should collect the same data as ANC surveillance sites.	Fulgentius Baryarama and Rebecca Bunnell		▓		A comparison of PMTCT and ANC prevalence data is to be presented at Sintra by Wolfgang Hladik of CDC.
More detailed analysis of VCT versus population prevalence surveys from Uganda needed	Fulgentius Baryarama and Rebecca Bunnell	▓			Status unknown.
Currently, for SSA continue estimates and projections of prevalence without accounting for HAART in EPP (the coverage of which is minimal), and focus on projecting the need for HAART. In the future, monitor coverage and effectiveness and review this assumption.	UNAIDS			▓	John Stover has reviewed HAART coverage in SSA ("Coverage of selected health services for HIV/AIDS prevention and care in less developed countries in 2001" WHO, November 2002.) Current levels of coverage in sub-Saharan Africa do not justify inclusion in EPP but this will be revisited in the future.

*For recommendations without a specific timeframe, no deadline is indicated

Recommendations 2003

Table 3 Recommendations from the Reference Group Meeting in December 2003: Generalised epidemics

Recommendations	Who responsible?	Timeframe		
		2m	6m	1yr
Adult non-AIDS mortality has been overestimated in the past due to the use of inappropriate lifetables. Revise these lifetables based on the recommendations of the UN Population Division in consultation with Ian Timaeus. Thomas Buettner to make current methods for estimation of life expectancy in the absence of AIDS available to UNAIDS/WHO.	Ian Timaeus, John Stover, Thomas Buettner, Peter Way, Rob Dorrington, Karen Stanecki			
Revise survival curve for HIV positive children based on re-analysis of cohort data and consideration of data from developed countries before the advent of antiviral therapy.	Basia Zaba			
Estimate prevalence among pregnant women directly from ANC to allow estimates of the number of infected children rather than carrying out a full population projection as was previously implemented. This avoids the need to estimate the sex and age distribution of infections and the impact of HIV on fertility when producing HIV/AIDS statistics for children.	John Stover			
Allow sex ratio (F:M) of infections to plateau at 1.3 rather than 1.2 based on review of data.	John Stover			

Intervals about estimates
1. Ranges around adult prevalence
Current characterization of countries in terms of data quality produces 3 groups with (currently) arbitrary intervals associated with each. Refine intervals for 3 groups based on parametric bootstrapping approach (Nick Grassly) that allows for:
  - variance of ANC in relation to population-based prevalence
  - uncertainty regarding survival curves
Analyze 3 countries per category to see if consistent, consider revised categorization if not
2. Ranges around child estimates
Additional uncertainty:
Estimate uncertainty about vertical transmission based on variation across different studies (reviewed by Reference Group in 2001)
Estimate uncertainty around child survival curves by bootstrapping cohort data (Meade Morgan)
3. Ranges around orphan estimates
Shift from using accumulated uncertainty from different modeling steps to direct estimate of uncertainty based on comparison with household surveys (Nick Grassly, Ian Timaeus)
 	
Uncertainty ranges for numbers will not incorporate uncertainty around populations, but this will be noted.
	Meade Morgan Peter Ghys Neff Walker Nick Grassly Ian Timaeus			

Young people (1) Note divergence of reporting needs for UNGASS indicator vs. information on actual quantity of interest (prevalence among young males and females as proxy indicator for recent incidence) UNGASS - include request with country estimates to provide ANC data for 15-19, 20-24 in capital city for 2003 and 2001 (or closest), including sample sizes Report should include separate table or box listing population-based data on prevalence, separately for males and females, 15-19 and 20-24, urban and rural	UNAIDS/WHO			

Young people (2) Modify Spectrum to allow for age pattern of force of infection rather than age pattern of prevalence Estimation of typical age patterns for force of infection should make use of all available data sources, including information on mortality More population-based data should be brought to bear on estimates of infection among young people	John Stover Reference Group			
Curve-fitting Integrate revised curve fitting approach into EPP that accounts for the consistency of reporting of sites over time by assigning each site a level parameter. Where data are available and when feasible, countries should be encouraged to consider site-specific EPP models, with subsequent allocation of population by proportion represented in each model. Manual and further training may be needed in medium term. Modify EPP to use maximum likelihood rather than least-squares optimization. This will require sample sizes to estimate binomial likelihood. Model will include fixed level effects across sites (as above). Consider modifying to include random level effects using beta binomial as implemented in the uncertainty analyses. Longer-term will consider additional fixed and random effects, e.g. start year, phi, etc.	Nicholas Grassly Tim Brown			
Include some incremental demographic flexibility to EPP (e.g. time varying fertility), and examine whether any important effects. Resistance to adding age structure (among non-demographers).				

Trends
In the Global Report for 2004 present point estimates and ranges for both 2001 and 2003 for
    Adult prevalence numbers and proportions
    Numbers of child infections
    Numbers of deaths
    Numbers of new infections
	UNAIDS/WHO			

Table 4 Recommendations from the Reference Group Meeting in December 2003: Low-level and concentrated epidemics

Recommendations	Who responsible?	Timeframe		
		2m	6m	1yr
Intervals about estimates PLWHA within risk population 　For each risk population, report a single interval for PLWHA calculated as the simple average of the lower two current ranges and the upper two current ranges 　Provide more guidance on definitions of extreme values – ranges versus confidence bounds incorporate into training 　Report 2001 and 2003 estimates. Use curve fit to provide 2001 estimate. Use interval from 2003 for prevalence, incidence and mortality and apply proportionately to 2001. 　Minimum plus or minus 35% interval. 　Don't publish estimates for children by country only regional estimates 　Feed upper and lower ranges into SPECTRUM 　Need to add uncertainty estimate to SPECTRUM mortality and other derived values PLWHA country sum: Report a single interval for PLWHA calculated as the sum of lower ranges and upper ranges. PLWHA regional sum: Investigate use of delta method	Beth Zaniewski Karen Stanecki Neff Walker Peter Ghys Meade Morgan Karen Stanecki	▓		
Curve fitting On the country level workbook, use a linear interpolation between points, past and present to represent trends. Smooth the curves using generic algorithm (e.g. cubic spline) smoother. Ensure ex-high risk groups are specified in the workbook. Where data available fit "turnover" EPP model by risk population specified in the workbook. Combine these to give the country trend. Inform estimates for ex-high risk groups indirectly from models or directly from surveillance data	Ping Yan Meade Morgan Tim Brown		▓	▓
Young people Not an UNGASS indicator for low-level and concentrated epidemics. Therefore don't report 15-24 year old estimates if overall country prevalence is <1%. Countries may report these data in country fact sheets where data warrant. Collect year of age (not age group) and gender since emphasis on 15-24 year olds is a disservice (Geoff). When reporting aggregate prevalence data, be certain to report denominators. Collect information on duration of exposure (age alone is not an accurate indicator of exposure). Adds information on duration of turnover within the risk population. Explore use of biological markers of duration of infection				▓
Trends Be consistent with recommendations on reporting from Generalized Epidemic Workgroup re. point estimates and intervals If there is no clear trend in countries with concentrated epidemics, don't make a statement about trends without careful examination of risk groups.		▓		
Workbooks should calculate sex ratios over time and SPECTRUM should use those sex ratios.			▓	
The demographic package used in concentrated epidemics should be modified to handle individual risk populations				▓

References

Grassly, N.C., J. J. C. Lewis, M. Mahy, N. Walker and I. M. Timaeus (2004). Comparison of survey estimates with UNAIDS/WHO projections of mortality and orphan numbers in sub-Saharan Africa, *Popul. Stud.,* vol. in press.

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Walker, N., K. A. Stanecki, T. Brown, J. Stover, S. Lazzari, J-M. Garcia-Calleja and others (2003). Methods and procedures for estimating HIV/AIDS and its impact: the UNAIDS/WHO estimates for end of 2001, *AIDS,* vol. 17, pp. 2215-2225.

Agenda

9:00   ***Welcome and introduction to role of Reference Group***
       Chair: Peter Ghys and Ties Boerma

9:10   Current methods and tools   Peter Ghys
9:30   Feedback from regional workshops   Karen Stanecki
9:40   Publication timeline and content   Peter Ghys/Ties Boerma
9:50   Aim of this meeting   Geoff Garnett

      Low-level and concentrated epidemics
      Chair: Don Sutherland; Rapporteur: TBC

      Estimating epidemic and demographic trends
10:00   Rates of exit and non-AIDS mortality   Tim Brown
      of vulnerable groups (IDU, SW) in EPP
10:15   Spread of HIV from high to low risk groups   Geoff Garnett
10:30   Linking prevalence curves to demographic impact   Neff Walker
10:45   Estimation and presentation of current trends in   Tobi Saidel
      prevalence, incidence and mortality

11:00   *Coffee*

11:30   Age and sex distribution: estimates for young people   Neff Walker
11:45   Discussion

      Intervals about estimates
12:00   Uncertainty in estimates of size of vulnerable groups   Geoff Garnett
12:15   Combining uncertain estimates   Meade Morgan
12:30   Methods for confidence interval estimates   Ping Yan
12:45   Discussion

13:00   *Lunch*

      Generalised epidemics
      Chair: John Stover; Rapporteur: TBC

      Mortality
14:00   UN Population Division Estimates and Methods   Thomas Buettner
14:15   Household surveys to validate projections   Nick Grassly
14:30   Indepth study of adult mortality in Africa   Sam Clark
14:45   Mortality from causes other than AIDS   Ian Timaeus
15:00   Child mortality   Basia Zaba
15:15   Discussion

15:30   *Coffee/Tea*

      Fitting prevalence curves
16:00   Current and alternative approaches   Nick Grassly
16:15   Choosing appropriate surveillance sites and assigning   John Stover
      denominator populations/ Sex distribution of infections
16:30   Current approach of UN Population Division   Thomas Buettner
16:45   Discussion

Population prevalence surveys

17:00	Prospects and problems	Ties Boerma
17:15	Discussion	

17:30   End

Wednesday 3rd

Generalised epidemics contd.

Young people (YP) and HIV

9:00	A review of HIV prevalence among YP in Africa	Emil Asamoah-Odei
9:20	HIV incidence and prevalence among YP in the general population and in pregnant women	Basia Zaba
9:40	A comparison of ANC and community prevalence	Simon Gregson

Intervals about estimates and projections

10:00	Overview of approach	Neff Walker
	Errors in HIV test results	Peter Ghys
	Uncertainty in the epidemic curve and AIDS mortality	Nick Grassly
	Uncertainty in numbers of HIV positive children born	John Stover
	Uncertainty in child survival	Meade Morgan/Basia Zaba

11:00   *Coffee*

11:30	Quality of HIV surveillance	Txema Calleja

Presentation of epidemic trends

11:45	Approach in WHO/AFRO report	Ties Boerma
11:55	Approach of Zimbabwe report	Simon Gregson
12:05	Statistical tests of consistent sites	Neff Walker

12:05 – 17:30   *Group work (lunch and tea at same times as Tuesday)*
          Group 1: Low-level and concentrated epidemics
          Group 2: Generalised epidemics

Thursday 4th

9:00   Working groups contd.

11:00   *Coffee*

11:30   Presentation and discussion of working group recommendations
          Chair: Geoff Garnett, John Stover
          Rapporteur: TBC

13:00   *Lunch*

Antiretroviral therapy
Chair: ?; Rapporteur: ?

14:00	Impact of ART on prevalence in Brazil	Celia Landmann-Szwarcwald
14:15	Modelling impact of ART on prevalence	John Stover
14:30	UNAIDS/WHO method for estimates of people in need of treatment	Neff Walker
14:40	Review of time from CD4=200/AIDS to death in the absence of treatment	Marcel Zwahlen
15:00	Discussion	

15:30 *Coffee*

Changing surveillance
16:00	PMTCT versus ANC-based surveillance	Wolfgang Hladik
16:20	Discussion	

16:30   Meeting conclusions

17:00   End

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