

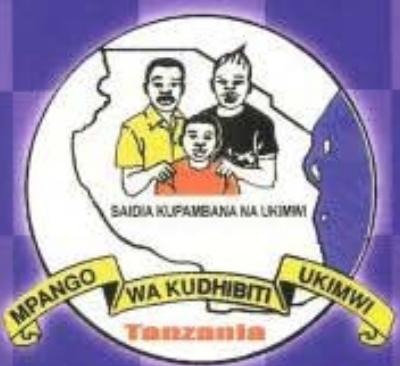
THE UNITED REPUBLIC OF TANZANIA



MINISTRY OF HEALTH

Tanzania Mainland

National AIDS Control Programme



HIV/AIDS/STI Surveillance Report

January - December 2004

Report Number 19

Issued: October 2005

THE UNITED REPUBLIC OF TANZANIA



MINISTRY OF HEALTH

Tanzania Mainland

National AIDS Control Programme



HIV/AIDS/STI Surveillance Report

January - December 2004

Report Number 19

Issued: October 2005

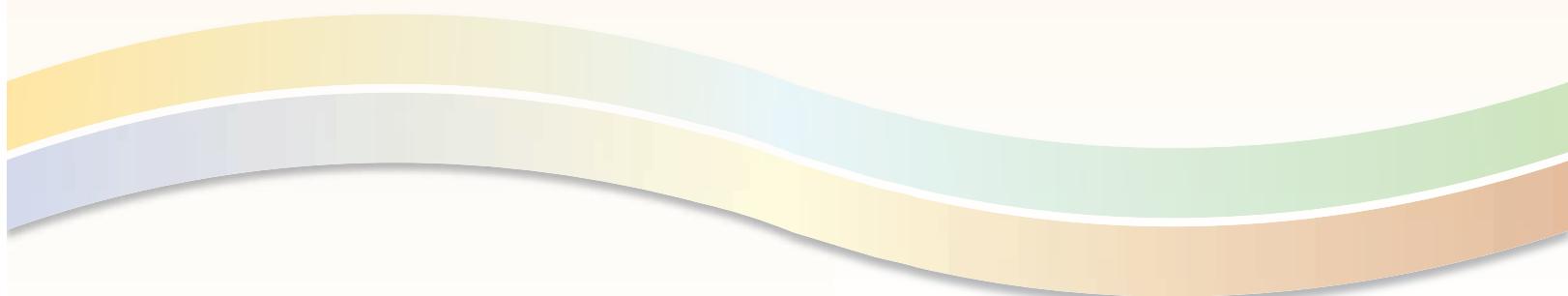


Table of Contents

S.No.	Contents	Page
	Abbreviations and acronyms	i
	Acknowledgements	ii
	Distribution of the report	iii
	Executive summary	iv
1.0	SURVEILLANCE OF AIDS CASES	1
2.0	SURVEILLANCE OF HIV INFECTION	10
2.1	Surveillance population: Antennal clinic attendees	10
2.2	Surveillance population: Blood Donors	21
3.0	NATIONAL HIV/AIDS ESTIMATES AND PROJECTIONS.....	37
4.0	SURVEILLANCE OF COMMON SEXUALLY TRANSMITTED INFECTIONS.....	47
5.0	MONITORING OF VOLUNTARY COUNSELING AND HIV TESTING SERVICES	52
6.0	HIGHLIGHTS OF RESEARCH ACTIVITIES IN TANZANIA	56
	ANNEX	71

Abbreviations/Acronyms

AIDS	Acquired Immune Deficiency Syndrome
ANC	Antenatal Clinics
ARV	Antiretroviral
CDC	U.S. Centers for Disease Control and Prevention
CI	Confidence Interval
DBS	Dried blood spot filter paper cards
ELISA	Enzyme Linked Immunosorbent Assay
EPTB	Extra pulmonary tuberculosis
EU	European Union
FBOs	Faith Based Organizations
GDS	Genital Discharge Syndrome
GUD	Genital Ulcer Disease
HIV	Human Immunodeficiency Virus
IDC	Infectious Diseases Clinic
MOH	Ministry of Health
MUCHS	Muhimbili University College of Health Sciences
NACP	National AIDS Control Programme
NGO	Non Government Organizations
NIMR	National Institute for Medical Research
PID	Pelvic Inflammatory Diseases
PYAR	Person-years at risk
QA	Quality Assurance
RPR	Rapid Plasma Reagins
STD	Sexually Transmitted Disease
STI	Sexually Transmitted Infection
TDHS	Tanzania Demographic and Health Survey
UN	United Nations
UNAIDS	Joint United Nations Programme on AIDS
UNDP	United Nations Development Programme
VCT	Voluntary Counseling and Testing
VDRL	Venereal Disease Research Laboratory
WHO	World Health Organisation

Acknowledgements

The National AIDS Control Programme (NACP), Tanzania wishes to acknowledge with sincere gratitude all those who contributed to the production of this report.

Our thanks go to all health care providers at the Regional, District and Health care facility levels who have given so earnestly of their time and energy. Their contributions made this report possible.

We acknowledge with gratitude the financial and technical contributions from partners towards the production of this report. These partners include Joint United Nations Programme on AIDS (UNAIDS), World Health Organisation (WHO), United Nations Development Programme (UNDP) and the U.S. Centers for Disease Control and Prevention (CDC).

The final report was prepared by:

Dr. R. Swai	Programme Manager, NACP
Dr. G. Somi	Head, Epidemiology, NACP
Prof. J. Killewo	Epidemiologist, MUCHS
Prof. E. Lyamuya	Microbiologist/Immunologist, MUCHS
Prof. M. Matee	Microbiologist/Immunologist, MUCHS
Dr. T. S. Kabalimu	Commission of Science and Technology
Dr. G. Kвесигабо	Epidemiologist, MUCHS
Dr. T. Tulli	Surveillance Officer, NACP
Mr. R. Isingo	Statistician, NIMR, Mwanza Centre
Mr. J. Ndayongeje	Management Information System Clerk, NACP

Report Distribution

This report is distributed to all sectors, individuals and agencies concerned with fight against HIV/AIDS/STD in Tanzania. The following are already on the Programme's mailing list for regular distribution:

Regional Medical Officers
Medical Officers In Charge of Specialised Hospitals
District Medical Officers
Medical Officers In Charge of Hospitals
Departments of the Ministry of Health
United Nations System
U. S. Centres for Diseases Control and Prevention
Donor Assistance Committee
Members of the Sectoral Technical AIDS Committees
Members of the NACP Committees and Sub-committees
Members of the National AIDS Committees
National and Medical Libraries
Sectoral Ministries
Collaborating NGOs

Single copy may be requested from the address below:

Programme Manager
National AIDS Control Programme
P.O. Box 11857
Tel: +255 22 212 1624 • Fax: +255 22 213 8282
E-mail: nacp@nacptz.org
Dar es Salaam, Tanzania

Or download your copy from:
www.nacptz.org

EXECUTIVE SUMMARY

This report summarizes the magnitude and trend of HIV/AIDS/STIs in Mainland Tanzania for the annual year January to December 2004.

A total of 16,430 AIDS cases were reported to the NACP from the 21 regions during the year 2004. This resulted into a cumulative total of 192,532 reported cases since 1983 when the first 3 cases were identified in the country.

About 5% (540) of the AIDS cases reported in 2004 were below 15 years of age and most of these are likely to have acquired infection through mother to child transmission. The age group 20-49 years remained the most affected for both sexes, an observation that has remained consistent for several years since the beginning of the epidemic in the country. The observed clustering of cases in the age group 20-49 indicates that the majority of infections occur during the age of maximum sexual activity.

As in the previous years, the predominant mode of HIV transmission has remained heterosexual constituting up to 78.1% of all reported AIDS cases during 2004. Mother to child transmission constituted 4.6% and blood transfusion 0.5%. In about 17% of the cases, the mode of acquisition of infection was not stated. Of all AIDS cases reported during year 2004, 55.6% were married, while 23.2% were single. The marital status of the remaining cases were; divorced (3.5%), separated (2.0%), cohabiting (3.5%) and widowed (0.6%). In about 11.7% of cases, the marital status was not stated. Readers are cautioned that it is wrong to interpret the data as 55.6% of married couples in Tanzania are HIV positive. They do not represent the proportion of AIDS cases among married couples in Tanzania; rather they reflect the proportion of cases among the different marital categories of patients with AIDS.

A total of 154,045 individuals donated blood during the year 2004. All individuals were aged more than 15 years and therefore were all included in the analysis.

The majority of blood donors were males constituting 83.7% of all donors and the rest being females. As in the past year, most blood donors were relatives of patients (98.95%) and the rest were institutional, paid donors and volunteers (0.55%), (0.48%) and (0.01%) respectively.

The overall prevalence of HIV infection among blood donors during 2004 was 7.7% (95% CI, 7.5-7.7). This is a decrease of 1.1% compared to the 2003 prevalence of 8.8% ($p<0.0001$). This is the third year running a decrease in prevalence is noted among blood donors. A decrease was first noted in 2002. The sex specific prevalence was higher among females at 10.7% ($N=25,076$) compared to that of 7.2% ($N=128,969$) among males ($p<0.0001$).

Using estimations and projections package (EPP) and the spectrum model developed by WHO, it is estimated that, in the year 2004, 1,840,000 people were living with HIV (860,000 males and 980,000 females) in Tanzania mainland. On the basis of estimations that only 1 in 14 AIDS cases are reported, a total of 188,140 cases are likely to have occurred in year 2004 alone, females being 97,690 and males 90,450. Assuming total absence of antiretroviral (ARV) drugs, the estimated annual AIDS deaths in Tanzania mainland for the year 2004 was 187,350 (89,300 males and 98,040 females). This corresponds to findings from studies which observed that, from the time a person develops AIDS symptoms to his/her death, it takes about one to two years in the absence of ARV drugs.

Sexually transmitted infections (STIs) are a marker of sexual networking and give a clue to the extent of unprotected sex in a community. During the year 2004, a total of 208,384 STI episodes were reported throughout the STI clinics. Of these, 94,366 (45.3%) were genital discharge syndromes, 40,408 (19.4%) were genital ulcer diseases, 49,605 (23.8%) were pelvic inflammatory diseases and other syndromes constituted 24,005 (11.5%).

Regions reporting the highest number of episodes included Dar es Salaam, Mwanza, Mbeya, Shinyanga and Tanga in decreasing order. The least number of episodes were reported from Lindi, Kagera, Singida and Tabora. Overall, the number of STI episodes especially syphilis among females was higher than in males. This observation may not be due to a true higher incidence of STI among females, rather it reflects differences in health seeking between females and males. The most affected age groups in both sexes were those of 20-29 years, followed by the age group 30 years and above.

During 2004, VCT services continued to be provided throughout the country. A total of 190,737 new clients consented for HIV testing. Of the new clients, 100,342 (52.6%) were reported from health facility based VCT sites while 90,395 (47.4%) were reported from ANGAZA sites. The increase in the number of clients who tested in 2004 was quite remarkable compared to the trend in the past. This increase is partly attributed to improved access to VCT services following opening of many VCT sites in different areas in the country during this year. It may also be a reflection of the growing awareness of the importance of VCT.

The overall HIV prevalence using data from VCT in health facility based sites was 39.3% while it was 10.7% using data from the 34 ANGAZA sites, which are distributed in some areas of the country. The prevalence of HIV infection in the health facility based sites ranged from 6.9% in Manyara to 51.4% in Tanga region. Putting together the hospital-based sites with the ANGAZA sites, the overall HIV prevalence was 24.8%. This prevalence is difficult to interpret since there may be many selection factors among clients accessing different VCT services.

In conclusion, the spread of HIV infection continued as in previous years. Data obtained from various surveys indicate high risk of HIV infection among youth and higher vulnerability to infection among women.

1.0 SURVEILLANCE OF AIDS CASES

Introduction

AIDS became a notifiable disease in Tanzania since 1985. Health authorities throughout the country were therefore obliged to report AIDS cases to the Ministry of Health (MoH). In the early phase of the epidemic, surveillance of AIDS cases was the only type of data collected in the country to track the spread of the epidemic. Initially notification of AIDS cases was done using multiple approaches including special forms, telephone, and telex and telefax communication with MOH. This mixed system of reporting resulted into sets of data that lacked uniformity in terms of the parameters reported. This was later resolved by the introduction of a notification form that was adopted for use in all health care facilities in the country.

Methods

AIDS cases diagnosed in governmental and non governmental hospitals in the country are reported to the National AIDS Control Programme (NACP), using forms distributed to all hospitals through the Regional Medical Officers (RMO). Information collected include name of reporting hospital, socio-demographic characteristics of the diagnosed case including district of usual residence, case definition criteria used to make the diagnosis, possible source of infection and whether or not an HIV test was done. Hospitals return duly-filled forms to the Regional Medical Officer (RMO) monthly, for subsequent transmission to the NACP on a quarterly basis.

Distribution of AIDS cases

Between 1st January and 31st December 2004, a total of 16,430 cases were reported to the NACP from the 21 regions of Tanzania Mainland. This resulted into a cumulative total of 192,532 cases since 1983 when the first AIDS cases were reported in Tanzania. The number of cases reported in 2004 (16,430) were fewer than those reported in 2003 (18,929). Table 1.1 and Figure1.1 show the age and sex distribution of the reported AIDS cases for the year 2004. About 540 (5%) of the AIDS cases with known age and sex reported in 2004 were below 15 years of age and most of these are likely to have acquired infection through mother to child transmission. The age group 20-49 years remained the most affected for both sexes, an observation that has remained consistent for several years since the beginning of the epidemic. The observed clustering of cases in the age group 20-49 years indicates that the majority of infections occur during the age of maximum sexual activity. It is evident that there were more female AIDS cases than males in the age group 20-39. The preponderance of female cases was particularly striking for age groups 20-24 and 25-29 where female cases were almost twice as many as for males.

Theoretically, voluntary counseling and testing coupled with the use of antiretroviral (ARV) drugs would be expected to alter the observed pattern of AIDS cases in the country. Since the implementation of the National Care and Treatment Plan which started in 2004 it is still too early to see any impact of ARV on the incidence of AIDS in the country. As the treatment programme scales up to cover the whole country it would be necessary to monitor the trend of AIDS cases as one of the impact indicators of the ARV treatment programme.

Figure 1.2 shows the age and sex specific cumulative case rates from 1987-2004. The figure, as in the previous years, shows that males generally have a higher case rate than females particularly for the age group 30 years and above. High case rates for both sexes are in the age group 25-44 years.

Table 1.1: Distribution of reported AIDS cases by age and sex, Tanzania 2004

Age group	Male		Female		Unknown		Total	
	N	%	N	%	N	%	N	%
0 - 4	154	3.8	122	2.7	8	0.1	284	1.7
5 - 9	83	2.1	68	1.5	3	0.0	154	0.9
10 - 14	41	1	55	1.2	6	0.1	102	0.6
15 - 19	52	1.3	150	3.3	4	0.1	206	1.3
20 - 24	227	5.7	562	12.3	14	0.2	803	4.9
25 - 29	507	12.7	928	20.3	22	0.3	1,457	8.9
30 - 34	825	20.6	1005	22	35	0.4	1,865	11.4
35 - 39	620	15.5	635	13.9	22	0.3	1,277	7.8
40 - 44	581	14.5	459	10	10	0.1	1,050	6.4
45 - 49	349	8.7	252	5.5	11	0.1	612	3.7
50 - 54	225	5.6	156	3.4	12	0.2	393	2.4
55 - 59	117	2.9	59	1.3	3	0.0	179	1.1
60 - 64	93	2.3	38	0.8	2	0.0	133	0.8
65 +	96	2.4	33	0.7	2	0.1	131	0.8
Unknown	35	0.9	48	1.1	7,701	98.0	7,784	47.4
Total	4,005	100	4,570	100	7,855	100.0	16,430	100.0

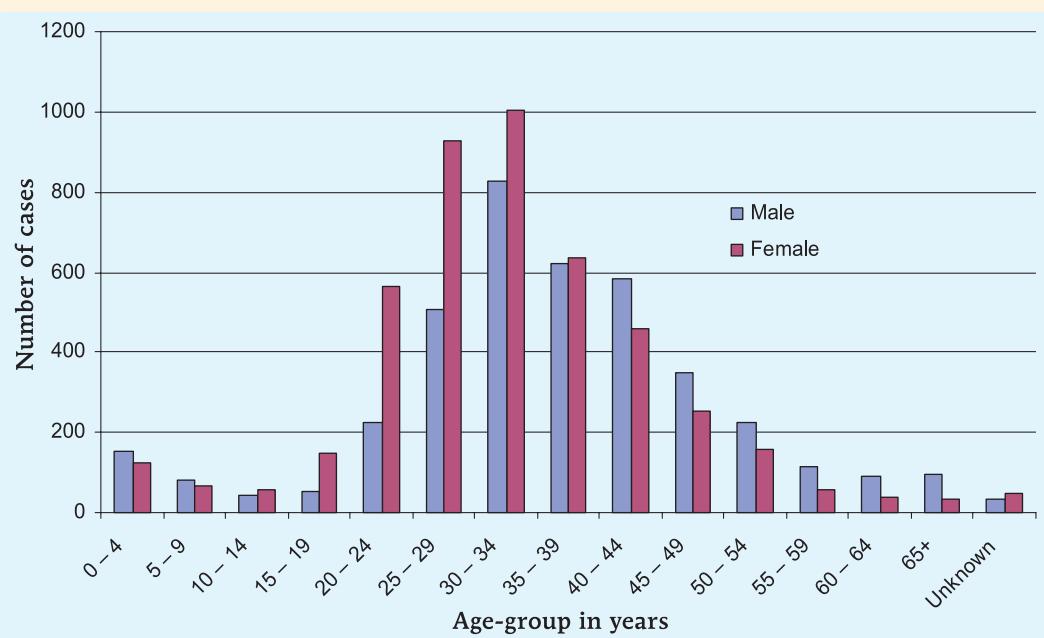


Fig 1.1: Distribution of reported AIDS cases by age and sex, Tanzania, January – December 2004

Table 1.2: Case rates for Cumulative AIDS Cases by age and Sex, Tanzania, 1987 - 2004

Age	MALE			FEMALE			Unknown			TOTAL			
	Cases	%	Population year 2004 ⁺	Case rate*	Cases	%	Population year 2004 ⁺	Case rate	sex	Cases	%	Population year 2004 ⁺	Case rate
0 - 4	2,963	4.3	2,915,040	101.6	2,636	3.6	2,920,301	90.3	123	5,722	3.4	5,835,341	98.1
5 - 9	824	1.2	2,647,401	31.1	802	1.1	2,629,028	30.5	72	1,698	1.0	5,276,429	32.2
10 - 14	413	0.6	2,293,251	18.0	515	0.7	2,269,767	22.7	21	949	0.6	4,563,018	20.8
15 - 19	1,117	1.6	1,810,630	61.7	3,336	4.5	1,883,912	177.1	33	4,486	2.7	3,694,542	121.4
20 - 24	5,120	7.4	1,440,293	355.5	12,136	16.5	1,798,035	675.0	108	17,364	10.4	3,238,328	536.2
25 - 29	11,842	17.2	1,346,980	879.2	16,880	22.9	1,535,039	1099.6	192	28,914	17.2	2,882,019	1003.3
30 - 34	14,298	20.7	1,120,134	1276.5	14,492	19.7	1,172,765	1235.7	234	29,024	17.3	2,292,899	1265.8
35 - 39	10,981	15.9	846,334	1297.5	9,176	12.5	866,441	1059.0	180	20,337	12.1	1,712,775	1187.4
40 - 44	7,806	11.3	687,866	1134.8	4,968	6.7	697,113	712.7	132	12,906	7.7	1,384,979	931.9
45 - 49	4,659	6.8	491,405	948.1	2,584	3.5	521,560	495.4	84	7,327	4.4	1,012,965	723.3
50 - 54	2,549	3.7	440,706	578.4	1,314	1.8	468,441	280.5	56	3,919	2.3	909,147	431.1
55 - 59	1,259	1.8	298,859	421.3	583	0.8	310,685	187.6	19	1,861	1.1	609,544	305.3
60 - 64	800	1.2	295,922	270.3	354	0.5	327,384	108.1	14	1,168	0.7	623,306	187.4
65+	621	0.9	676,187	91.8	260	0.4	719,299	36.1	14	895	0.5	1,395,486	64.1
Unknown	3,752	5.4			3,646	4.9			23,659	31,057	18.5		
Total	69,004	100.0	17,311,007	398.6	73,682	100.0	18,119,770	406.6	24,941	167,627	100.0	35,430,777	473.1

*Case rate: Number of cases per 100,000 populations

+Populations for 2004 are projected from population census 2002.

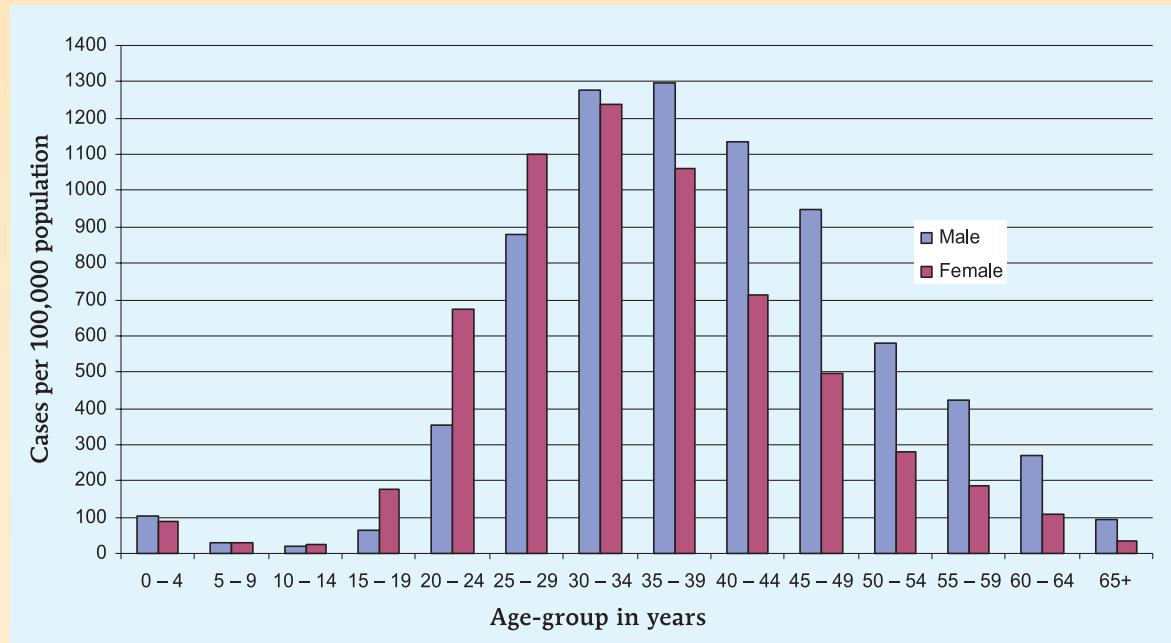


Fig 1.2: Case rates for cumulative AIDS cases by age and sex, Tanzania, 1987 – 2004

Marital status and possible sources of infection for the reported AIDS cases during the year 2004 were analyzed. These findings are presented in figures 1.3a and 1.3b. As for previous years, the predominant mode of HIV transmission has remained heterosexual constituting up to 78.1% of all infections during 2004. Mother to child transmission constituted 4.6% and blood transfusion 0.5%. In a significant proportion of cases (16.0%), the mode of acquisition of infection was not stated, an observation that calls for the need to strengthen AIDS case reporting. The reported figure of 0.5% of infections resulting from transmission through blood transfusion has remained consistent for several years. This figure is still unacceptably high given that all donor blood in the country is screened for HIV since 1987. It is likely that this category also contains cases that are misclassified, such as cases resulting from handling blood in other ways other than blood transfusion.

As illustrated in figures 1.3a and 1.3b the proportion of AIDS cases for the various modes of transmission in 2004 do not significantly differ from those for the year 2003. From figures 1.4a and 1.4b, 48.7% and 55.1% of reported AIDS cases reported in 2003 and 2004, respectively were married. One should be circumspect in interpreting these data. They do not represent the proportion of AIDS cases among married couples in Tanzania; rather they reflect the proportion of cases among the different marital categories of patients with AIDS.

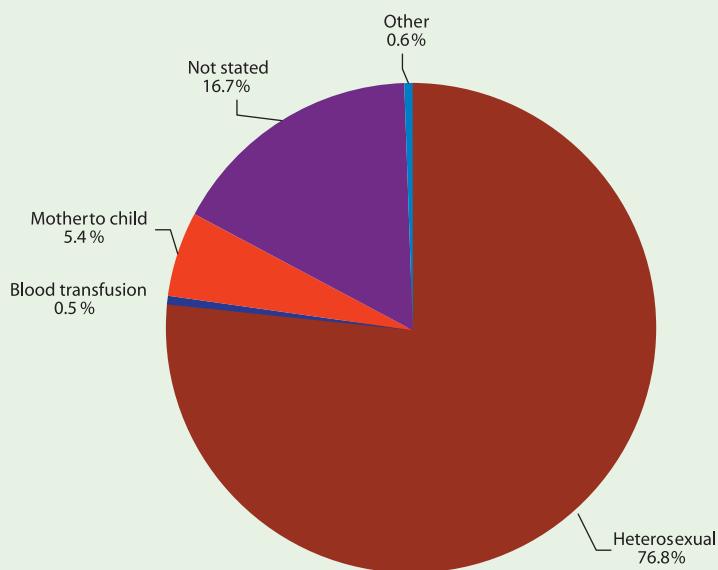


Fig 1.3a: Possible source of infection for reported AIDS cases 2003

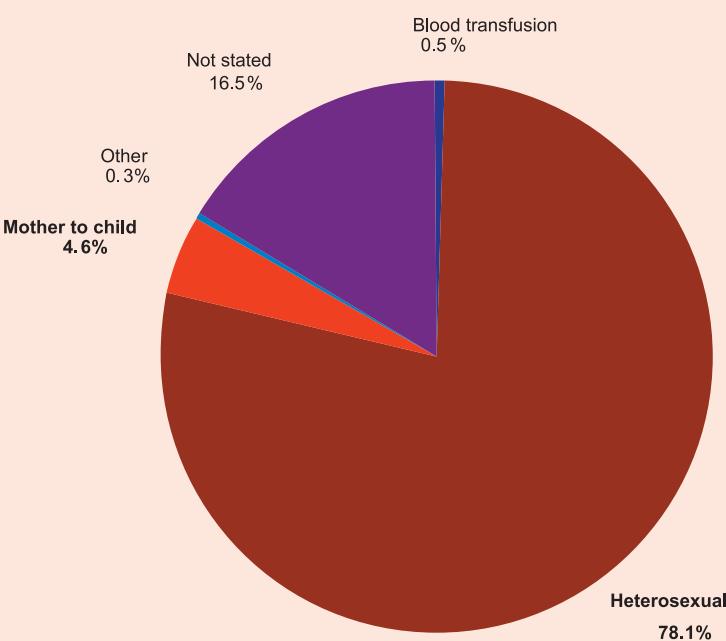


Fig 1.3b: Possible source of infection for reported AIDS cases 2004

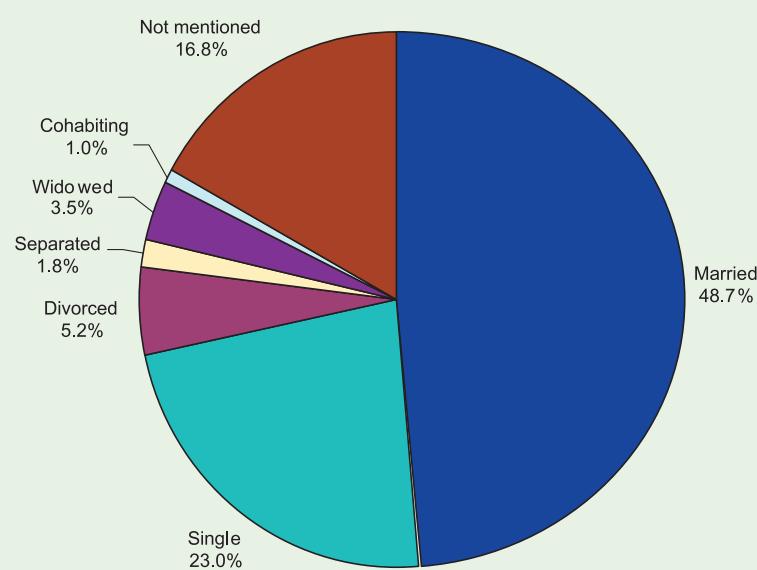


Fig 1.4a: Marital status for the reported AIDS cases for the year 2003

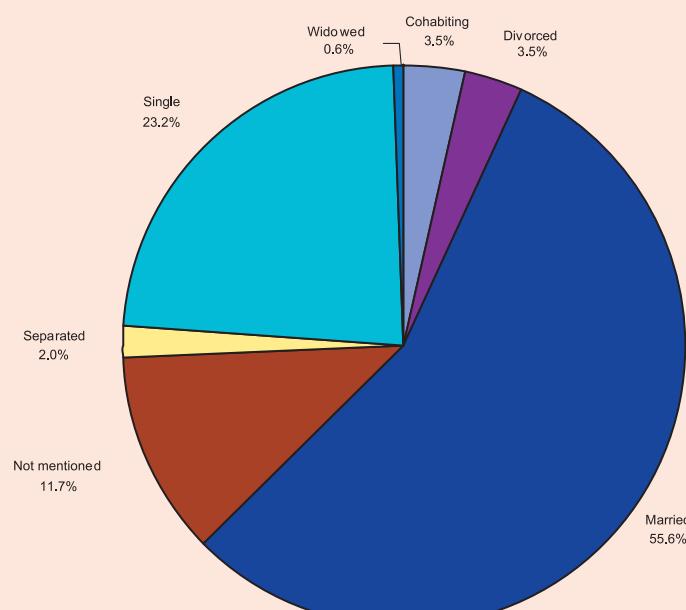
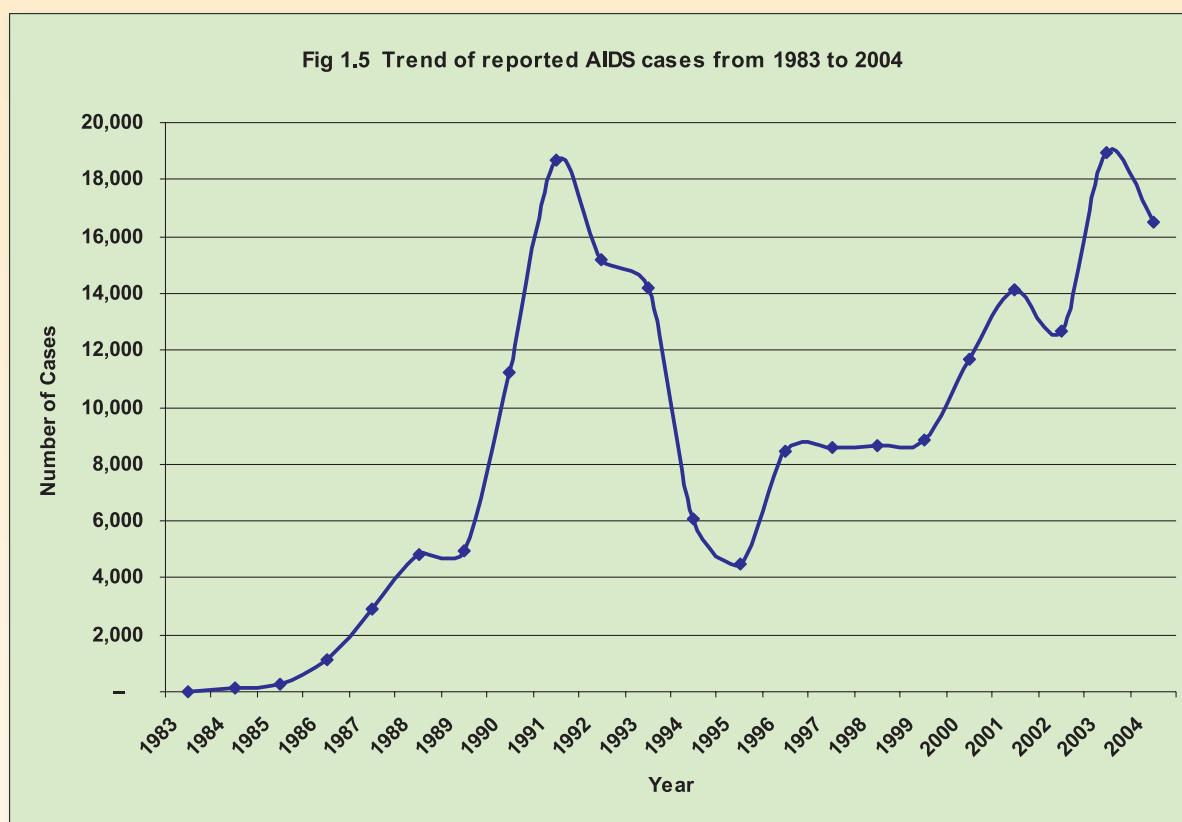


Fig 1.4b: Marital status of reported AIDS cases for the year 2004

Tables 1.3a and 1.3b show the cumulative number of AIDS cases by region since the detection of the early cases in Tanzania two decades ago (1983-2004). The distribution of AIDS cases by region is based on where the diagnosis was made and does not necessarily reflect the place of usual residence of the diagnosed case. The NACP estimates that only 1 out of 14 AIDS cases are reported due to underutilization of health services, under-diagnosis, under-reporting and delays in reporting. Despite these limitations, if the error of underreporting is consistent, the data is believed to reflect the trend of AIDS cases in the country. Figure 1.5 depicts the trend of reported AIDS cases in Tanzania from 1983-2004. In the period 1983-1986 few cases were reported to NACP and these were not characterized in terms of age group. Overall there has been a gradual increase in the number of reported cases from 1983-2004. There was a significant increase in the number of reported cases between 1990 -1993. This peak just reflects aggressive data collection during this period and does not represent a peak in AIDS morbidity in the country.



In 2004 the three leading regions with high number of AIDS cases in descending order were Mbeya, Dar es Salaam and Kilimanjaro. Mbeya and Dar es Salaam have consistently ranked highest in the number of AIDS cases for the past several years. Population based findings from the Tanzania Health Indicator Survey (THIS) carried out in 2003/2004 also showed that the three leading regions in HIV prevalence in descending order were Mbeya, Iringa and Dar es Salaam¹. The first four regions which reported lowest numbers of AIDS cases in 2004 were Morogoro, Iringa, Arusha and Kigoma in descending order. Interestingly, in the population based study done in 2003/2004, the four regions with lowest HIV prevalence were Kigoma, Manyara, Singida and Mara. From the NACP AIDS case reporting and THIS findings there appears to be a concordance in the pattern of HIV morbidity emphasizing that despite its limitations, surveillance data based on AIDS case reporting is still useful for tracking the trend of HIV/AIDS in the country.

¹ 2003 - 04 Tanzania HIV/AIDS Indicator Survey

Table 1.3 (a): Cumulative number of reported AIDS cases by region, Tanzania, 1983 – 1992.

Region	YEARS									
	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
Arusha	0	0	0	10	47	217	433	647	1,117	1,637
Coast	0	0	1	4	79	224	465	938	1,676	2,215
Dar es Salaam	0	0	51	471	1,470	3,093	5,209	7,246	8,834	9,259
Dodoma	0	0	0	7	47	105	262	310	536	762
Iringa	0	0	1	3	68	305	374	728	2,281	3,334
Kagera	3	106	322	847	1,666	2,143	2,576	3,472	4,742	5,813
Kigoma	0	0	0	3	50	109	244	607	930	1,556
Kilimanjaro	0	1	8	36	207	455	571	966	2,060	3,707
Lindi	0	0	0	1	10	46	113	484	842	1,211
Mara	0	0	0	3	30	99	141	280	639	980
Mbeya	0	0	0	16	208	751	1,077	3,890	6,924	9,890
Morogoro	0	0	0	11	88	254	364	637	2,398	3,598
Mtvara	0	0	1	5	26	90	199	479	1,361	1,968
Mwanza	0	0	15	54	171	448	667	1,303	3,041	4,207
Rukwa	0	0	0	1	5	98	94	140	261	496
Ruvuma	0	0	0	20	46	81	210	571	1,197	1,807
Shinyanga	0	0	0	8	31	144	238	583	1,278	496
Singida	0	0	0	6	74	197	284	456	763	1,807
Tabora	0	2	5	6	59	232	525	927	1,400	1,972
Tanga	0	0	0	13	80	210	210	838	1,914	2,636
Unspecified	-	-	-	-	-	-	-	1	1	1
TANZANIA	3	109	404	1,525	4,462	9,301	14,256	25,503	44,195	59,352

Table 1.3(b): Cumulative number of reported AIDS cases by region, Tanzania, 1993 - 2004.

Region	Years											
	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Arusha	2,185	2,368	2,615	2,787	3,244	3,567	3,948	4,196	4,688	4,785	6,476	6,569
Coast	2,740	3,023	3,268	3,559	3,796	4,266	4,375	5,348	5,580	5,737	5,884	7,904
Dar es Salaam	10,406	11,050	11,302	12,983	13,899	14,517	14,643	16,053	18,627	24,501	26,818	28,474
Dodoma	1,028	1,294	1,608	1,938	2,517	2,641	2,748	2,941	3,170	3,565	4,306	4,746
Iringa	4,462	4,674	4,785	4,883	5,008	5,031	5,076	5,179	5,298	5,318	6,079	6,167
Kagera	6,646	7,064	7,223	7,426	7,671	7,881	8,310	8,529	8,976	9,072	12,034	12,234
Kigoma	1,920	2,070	2,257	2,280	2,426	2,481	2,613	2,732	2,815	2,860	4,040	4,180
Kilimanjaro	4,699	5,119	5,513	5,991	6,618	7,375	7,766	8,088	9,097	10,042	11,909	12,791
Lindi	1,691	1,966	2,173	2,480	2,712	3,074	3,559	4,155	4,710	5,008	5,267	5,430
Mara	1,304	1,393	1,486	1,486	1,486	1,515	1,634	2,021	2,229	2,345	2,920	5,356
Mbeya	11,439	12,214	12,371	14,685	16,835	19,949	23,688	26,952	30,320	31,172	32,705	33,520
Morogoro	4,328	4,575	4,903	5,189	5,438	5,534	5,863	6,388	6,820	7,073	7,467	7,491
MtWARA	2,090	2,201	2,267	2,444	2,569	2,843	3,000	3,262	3,638	3,886	4,130	4,331
Mwanza	5,349	5,731	5,974	6,365	7,006	7,384	7,884	8,338	8,752	9,194	9,676	12,359
Rukwa	715	777	801	882	1,227	1,359	1,621	1,997	2,382	2,706	3,246	3,650
Ruvuma	2,480	2,847	3,087	3,345	3,752	4,260	4,760	5,406	6,381	7,080	7,743	8,655
Shinyanga	2,624	3,062	3,361	3,824	4,217	4,515	4,861	5,440	6,310	7,174	7,972	8,687
Singida	1,472	1,688	1,908	2,135	2,167	2,262	2,329	2,396	2,692	2,872	3,040	3,383
Tabora	2,786	3,075	3,428	3,805	4,278	4,733	5,199	5,946	6,349	6,810	7,323	7,720
Tanga	3,207	3,475	3,793	4,062	4,278	4,632	4,792	4,975	5,620	5,819	6,711	8,352
Manyara										110	312	489
Unspecified	1	2	44	44	44	44	44	44	44	44	44	44
TOTAL	73,572	79,668	84,167	92,593	101,188	109,863	118,713	130,386	144,498	157,173	176,102	192,532

2.0 SURVEILLANCE OF HIV INFECTION

2.1 Surveillance population: Antenatal clinic attendees

Sentinel surveillance of HIV infection utilizing antenatal clinic (ANC) attendees was established in 1990 when 24 sites were established in 11 out of the then 20 regions of Tanzania mainland. This was implemented until 1999, when the NACP undertook a comprehensive review resulting in revised and improved methods. HIV and syphilis surveillance was strengthened by three core activities that were implemented sequentially. A multidisciplinary team examined the strengths and weaknesses of the existing surveillance system in June 2000. The efforts resulted in the development of the document entitled "Guidelines for Monitoring and Evaluation during the Mid-Term Plan III, 2000-2002. These guidelines describe the principles used in HIV/AIDS surveillance, discuss behavioural surveillance approach for monitoring trends in sexual behaviour, and introduce various criteria for monitoring and evaluation of intervention programmes. Using these guidelines, the NACP revised the protocol for ANC surveillance. Consequently, new methods have been introduced, including dried blood spot (DBS) filter paper cards technology, standardization of HIV test approaches and quality assurance and a three-month data collection period has been adopted. Using the new strategy, six regions of Tanzania mainland were selected to participate in the 2001/2002 ANC HIV/STI surveillance. These regions were Dar es Salaam, Dodoma, Kagera, Kilimanjaro, Mbeya and Mtwara. In each participating region, four ANC clinics – an urban (located in the regional town), a semi-urban (located in a town other than the regional town) and two rural clinics that were located in either rural health centre or dispensary were selected. The exception to this arrangement were the Mbeya and Dar es Salaam regions where the clinics that were included were one urban, two semi-urban one rural and four urban, respectively.

Between October 2003 and January 2004 another ANC surveillance was conducted that included 10 geographical regions; six of them were involved in a previous survey, while the remaining four were freshly selected on the basis of having the largest population among the remaining 15 regions. Six ANC clinics two urban, two semi urban and two rural were selected from each region. The participating ANC clinics were selected on the basis of serving large catchment populations. This is a report of the 2003-2004 HIV and syphilis sero-surveillance.

Methods

A sero-survey was conducted between October 27, 2003 and January 23, 2004 among pregnant women attending selected ANC clinics in Tanzania. This was the second of a series of sentinel sero-surveys involving pregnant women that was started in 2001 and meant to continue over time in an attempt to monitor HIV and syphilis infection trends in the general population.

Site selection and surveillance population

In 1996 Tanzania Demographic and Health Surveys (DHS) clustered regions of Tanzania mainland into six geographical zones. The six zones were Coastal, Northern Highland, Lake, Central, Southern Highland and Southern. Site selection for the 2001/2 surveillance round was based on the location of the six zones from each of which one region was selected on the basis of prior participation in national ANC sentinel surveillance studies and availability of relevant data on HIV prevalence. For the current 2003/4 survey, ten regions were selected;

six of them being those surveyed in 2001/2 while the remaining four were freshly selected on the basis of having the largest population among the remaining regions. Thus, regions with largest populations were preferentially selected.

Subsequent to the selection of the ten regions, six ANC clinic sites were selected from each region on the basis of geographical location, a large catchment population, high average number of monthly bookings, road accessibility and previous participation in national sentinel surveillance studies. Hence, a total of sixty sites were obtained. However, three of the sites did not participate in the training exercise for the surveillance protocol and were therefore excluded from the study. The 57 sites included in the study were stratified into three distinct geographical categories for each region according to whether they were urban, semi-urban or rural with the following definition:

- Urban – ANC clinic is located within the regional headquarter town
- Semi-urban – ANC clinic is located in a town other than the regional headquarter town
- Rural – ANC clinic is located in a rural area.

Semi-urban sites located along major roads or border towns or the region were classified as roadside or border sites, respectively. The study population consisted of all the pregnant women presenting for the first time to the selected ANC clinics for any pregnancy during the surveillance period of three months.

Training for the surveillance protocol

In August 2003, a two-day sentinel surveillance-training workshop was held in Dar es Salaam to train those who would participate in the collection of the surveillance data. The training involved the clinic nurses and the laboratory technicians of selected sites. The training content of the workshop included the purpose of the study protocol, instructions on how to fill the study instrument, relevant theory for the laboratory testing, phlebotomy techniques using the vacutainer system, and the preparation, storage and shipping of DBS before testing in the laboratory. Role-playing among the trainees reinforced the sequence of steps from client encounter, to collection of demographic data, blood specimens and their testing. Laboratory technologists from Mbeya Referral Hospital and the Muhimbili University College of Health Sciences (MUCHS), Department of Microbiology and Immunology, and surveillance staff from NACP facilitated the workshop using the Kiswahili language to encourage interaction among the participants and to minimize problems of self-expression using the English language.

Field Supervision

To ensure adequate supportive supervision and quality assurance of field activities, the NACP assembled a team of laboratory and surveillance staff to monitor ANC staff and to ensure that the surveillance protocol is adhered to, the DBS preparation and storage are properly carried out and that the relevant supplies are available at all sites. Supervisory teams visited each site according to a regular timetable and completed a monitoring checklist. The teams also reviewed the stored DBS and data collection forms to confirm that collected demographic information was duly filled and available for all the stored specimens.

Specimen collection and Transportation

After obtaining consent from the pregnant woman at the clinic, a blood sample was taken for RPR testing. The remaining blood specimen was then used to prepare DBS for HIV

testing whereby consent was not needed. ANC staff applied 100ml of whole blood to each of five circles on a DBS card (labeled with a unique surveillance number and with patient identifiers removed), which was then left to dry at room temperature. DBS were stacked in plastic envelopes (zip lock bags), and stored with desiccant packs and humidity indicator cards together with their completed data collection forms. Desiccant packs were changed when humidity indicator cards changed colour from white to pink. Samples were collected continuously for 3 months between October 27, 2003 and January 23, 2004 from all sites, and data were entered onto a carbonized duplicate data collection form labeled with a unique surveillance number. Study variables included age, marital status, parity, educational level, distance from residence to ANC, and duration at present residence. ANC staff mailed completed data collection forms and DBS for HIV testing using weekly courier service to the National HIV Reference Laboratory (NHRL) at MUCHS. NACP continuously monitored the volume of DBS received by MUCHS from each site and contacted sites with unexpected posted numbers.

Syphilis Testing and Treatment

In all study sites rapid plasma reagin (RPR) test was done on the site. In the majority of rural sites, ANC nurse performed the test whereas, in most of the urban and semi-urban sites it was carried out in a laboratory by a Laboratory Technician/Assistant. Results were recorded directly on the data collection form and on woman's clinic card or laboratory investigation request form. No TPP or TPHA was done on the positives RPR samples for confirmation of test results or quality assurance. Women whose RPR test results were positive were offered treatment based on the National STD Treatment Guidelines.

HIV testing

The NHRL at MUCHS collaborated with the U.S. Centres for Disease Control and Prevention (CDC) on developing a DBS HIV testing protocol and algorithm. Due to a large number of DBS samples collected, six additional laboratory technologists, 4 from participating surveillance regions and 2 from zonal referral hospitals, were requested to join the technologists at the NHRL in testing the samples. At the laboratory, dried blood was eluted from the DBS card and tested using Vironostika® HIV Uni-Form II Ag/Ab ELISA test (Biomerieux, The Netherlands). Specimens with negative results underwent no further testing and were considered negative. Specimens that were positive on the first ELISA underwent a second ELISA test, Vironostika® HIV Uni-Form II Plus O (Biomerieux, The Netherlands). The ELISA algorithm was independently validated by CDC in Atlanta and by the NHRL at MUCHS. Specimens that reacted positive on the second test were considered positive. Specimens that reacted negative on the second test were considered negative.

Quality Assurance for HIV test

Ten per cent of all samples were randomly selected by MUCHS for quality assurance (QA) testing at a laboratory different from the one which carried out the initial testing. Every 10th sample starting from number 01 at each site was selected.

Results

HIV prevalence

A total of 17,813 antenatal clinic attendees were enrolled in the ANC serosurveillance from

57 clinics located in 10 regions of Tanzania between October 27th 2003 and January 23rd 2004. The number of enrolled women regionally ranged from 1,135 in Lindi to 3,018 in Dar es Salaam. A total of 1,545 women tested HIV positive resulting in an overall HIV prevalence in this population of 8.7% (95% CI = 8.3, 9.1). HIV infection prevalence ranged from a low of 4.7% (95% CI = 3.8, 9.8%) in Kagera region to a high of 15.7% (95% CI = 13.9, 16.8) in Mbeya region (Fig 2.1).

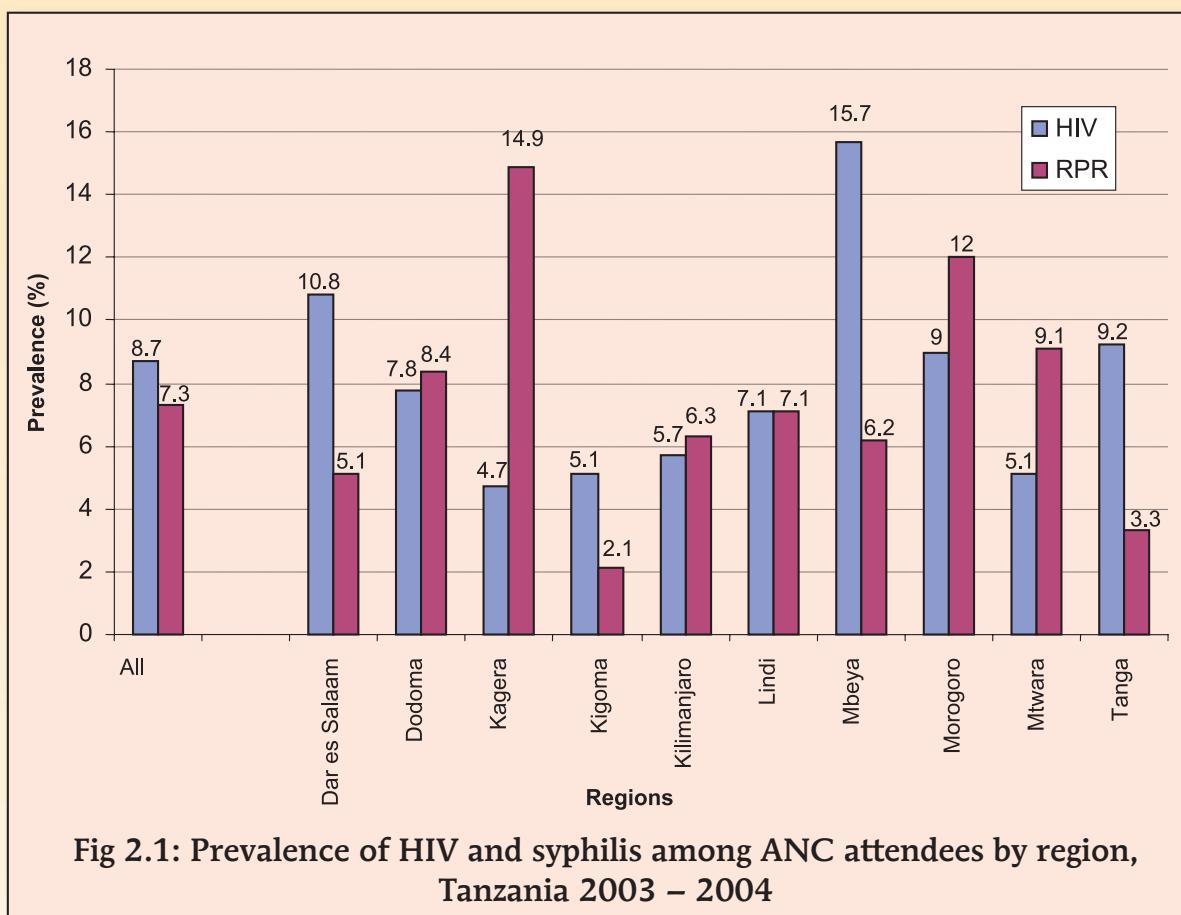


Fig 2.1: Prevalence of HIV and syphilis among ANC attendees by region, Tanzania 2003 – 2004

HIV prevalence is also presented at the clinic level (Table 2.1)

Of the 57 ANC sites included in the surveillance, 13 (22.8%) were found to have a prevalence of HIV infection of 10% or more. These high prevalence sites consisted of one clinic in Dodoma (urban), three urban clinics in Dar es Salaam, two clinics in Lindi (urban), one in Morogoro (urban), one in Tanga (urban) and five in Mbeya (2 urban, 1 rural, 1 border and 1 road side) (Table 2.1).

Table 2.1: Prevalence of HIV and syphilis infection by ANC sites, Tanzania 2003/04

Site	RPR			HIV		
	Total	Positive	% prevalence	Total	Positive	% prevalence
Dar es salaam	2959	151	5.1	3018	325	10.8
^c Buguruni	879	11	1.3	884	107	12.1
^c Kasorobo	446	46	10.3	450	43	9.6
^c Kigamboni	386	4	1.0	389	36	9.3
^c Oysterbay	466	37	7.9	478	50	10.5
^c Kimara	361	10	2.8	384	35	9.1
^c Kiwalani	421	43	10.2	433	54	12.5
Dodoma	1597	134	8.4	1621	126	7.8
^a Bahi	176	6	3.4	181	8	4.4
^a Handali	228	64	28.1	228	1	0.4
^e Kibaigwa	203	5	2.5	203	18	8.9
^c Makole	331	4	1.2	339	31	9.1
^b Mpwapwa	308	29	9.4	319	19	5.9
^c Wajenzi	351	26	7.4	351	49	13.9
Kagera	1814	270	14.9	1826	87	4.7
^c Bukoba	409	21	5.1	410	39	9.5
^b Katoro	244	64	26.2	245	6	2.4
^a Kimeya	235	51	21.7	241	2	0.8
^a Nkwenda	451	86	19.1	452	7	1.5
^b Nyamiaga	180	27	15.0	182	4	2.2
^c Rwamishenye	295	21	7.1	296	29	9.8
Kilimanjaro	1405	89	6.3	1429	81	5.7
^e Hedaru	219	84	38.4	221	5	2.3
^c Majengo	323	1	0.3	323	22	6.8
^a Masama	266	0	0	268	17	6.3
^a Umbwe	103	0	0	103	3	2.9
^b Huruma	187	2	1.1	323	26	8.1
^c Pasua	307	2	0.7	191	8	4.2
Mbeya	2386	149	6.2	2442	384	15.7
^e Chimala	249	18	7.2	249	38	15.3
^a Ilembo	178	13	7.3	188	15	8.0
^c Kiwanjampaka	724	29	4.0	726	137	18.9
^d Kyela	315	22	7.0	323	51	15.8
^a Igamba	195	29	14.9	228	24	10.5
^c Ruanda	725	38	5.2	728	116	15.9

Site	RPR			HIV		
	Total	Positive	% prevalence	Total	Positive	% prevalence
Mtwara	1262	115	9.1	1279	66	5.1
^c Ligula	388	29	7.5	389	37	9.5
^b Mangaka	264	21	8.0	267	13	4.9
^a Nanyamba	173	9	5.2	176	6	3.4
^b Tandahimba	146	8	5.5	147	1	0.7
^c Likombe	165	29	17.6	165	7	4.2
^a Mkunya	126	19	15.1	135	2	1.5
Kigoma	1246	26	2.1	1349	69	5.1
^b Kibondo	204	0	0.0	217	7	3.2
^b Kiganamo	293	5	1.7	326	11	3.4
^c Kigoma	296	6	2.0	301	21	7.0
^a Nyakitonto	113	2	1.8	163	6	3.7
^c Ujiji	340	13	2.8	342	24	7.0
Lindi	1112	79	7.1	1135	80	7.1
^a Chumo	132	4	3.0	141	4	2.8
^b Liwale	296	7	2.4	307	8	2.7
^b Nachingwea	227	32	14.1	227	22	9.7
^a Nyangao	231	20	8.7	233	12	5.2
^c Sokoine	117	7	6.0	119	16	13.5
^c Town clinic	109	9	8.3	113	18	15.9
Morogoro	1556	187	12.0	1630	147	9.0
^a Hembeti	81	9	11.1	99	2	2.1
^a Mkuyuni	154	5	3.3	173	3	1.7
^c Morogoro	550	54	9.8	559	64	11.5
^c Uhuru	771	119	15.4	799	78	9.8
Tanga	1986	65	3.3	2084	191	9.2
^b Handeni	380	8	2.1	403	32	7.9
^a Kwamkono	158	16	10.1	168	8	4.7
^b Lushoto	237	1	0.4	246	13	5.3
^a Magoma	171	7	4.1	175	2	1.1
^c Makorola	518	8	1.5	545	36	6.6
^c Ngamiani	522	25	4.8	547	100	18.3

Key: ^arural, ^bsemi-urban, ^curban, ^dborder, ^eroadside

The HIV prevalence differed according to residence ranging between 3.7% for rural clinics, 4.7% for semi-urban, 9.1% for road side, 11.2% for urban and 15.3% for border clinics ($p<0.001$) (Figure 2.2).

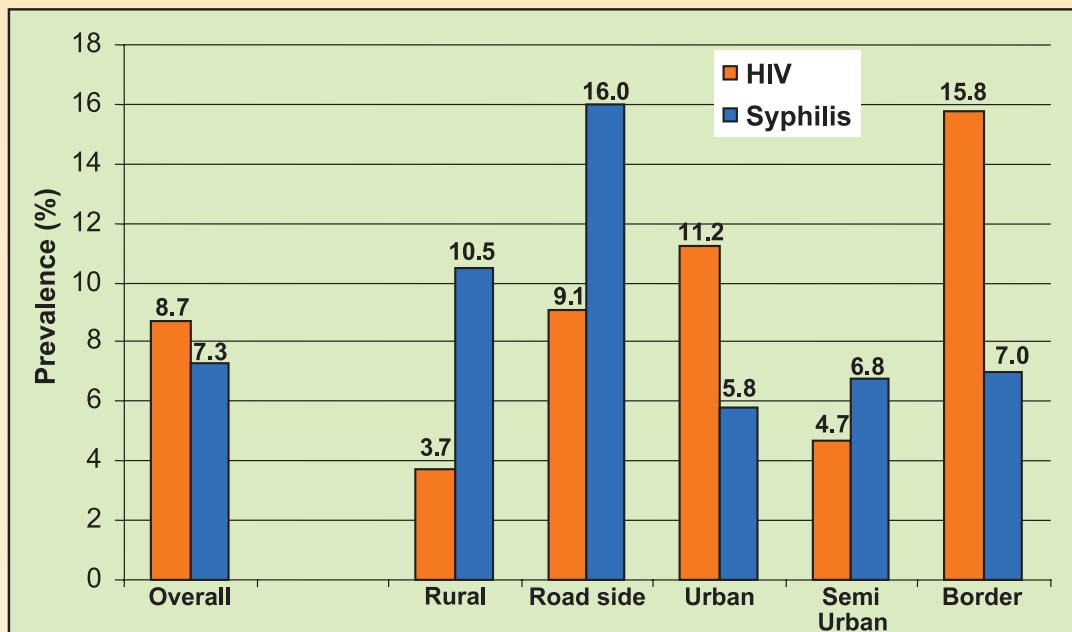


Fig 2.2: Overall and location specific Prevalence of HIV and Syphilis among ANC attendees Tanzania, 2003/04

In all regions, HIV prevalence was highest among women aged 25 – 34 years. Magnitudes were similar among the youngest and oldest age groups (Fig 2.3).

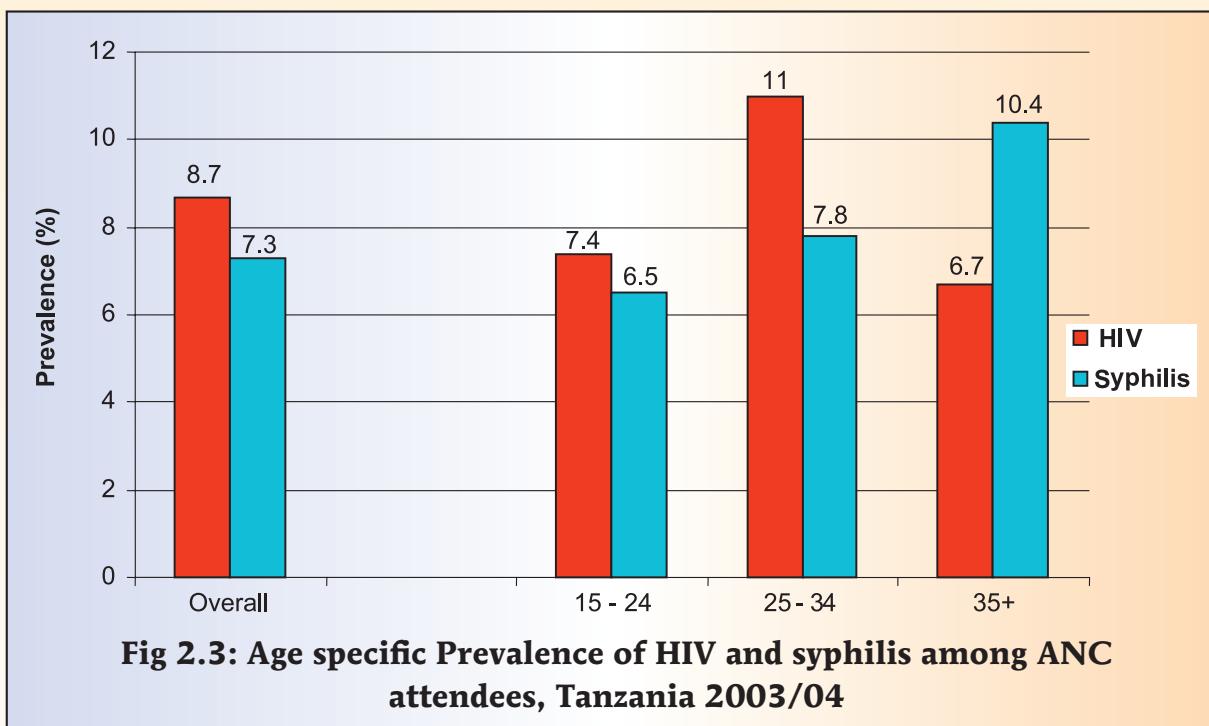


Fig 2.3: Age specific Prevalence of HIV and syphilis among ANC attendees, Tanzania 2003/04

HIV prevalence among single women (9.7%) was slightly higher but not statistically different from that of married women (8.6%) ($p=0.07$), (Fig 2.4).

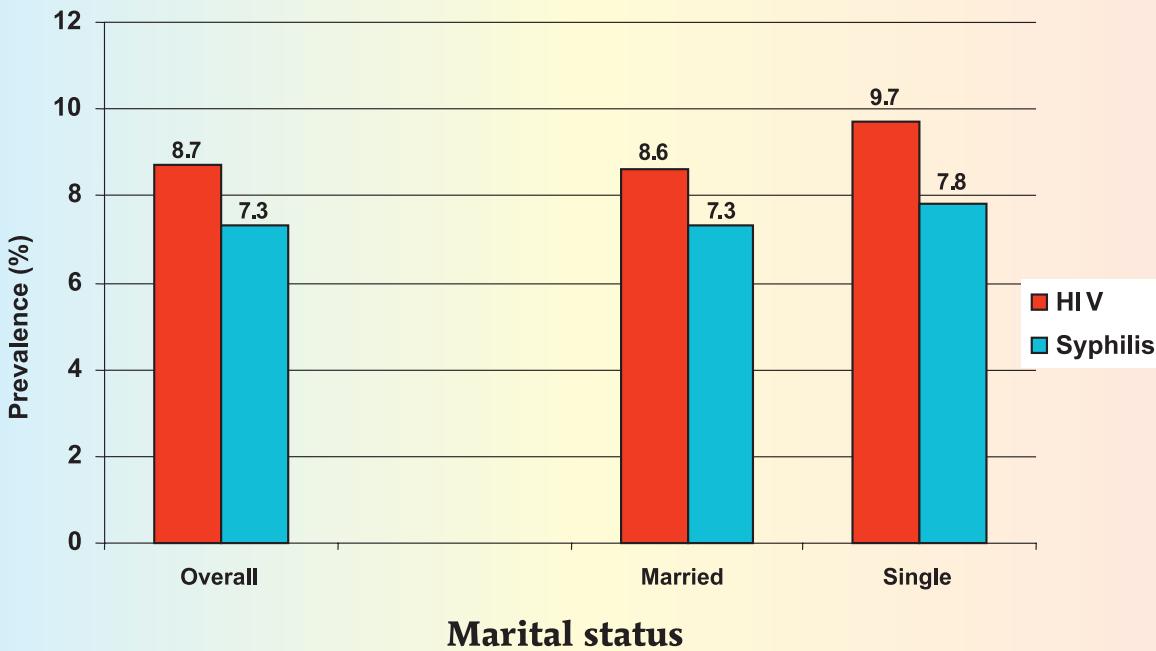


Fig 2.4: Prevalence of HIV and syphilis among ANC attendees by marital status, Tanzania, 2003/04

HIV prevalence increased with level of education from 5.2% among women with no education to 9.3% among those with some primary education or more ($p<0.001$) (Fig 2.5).

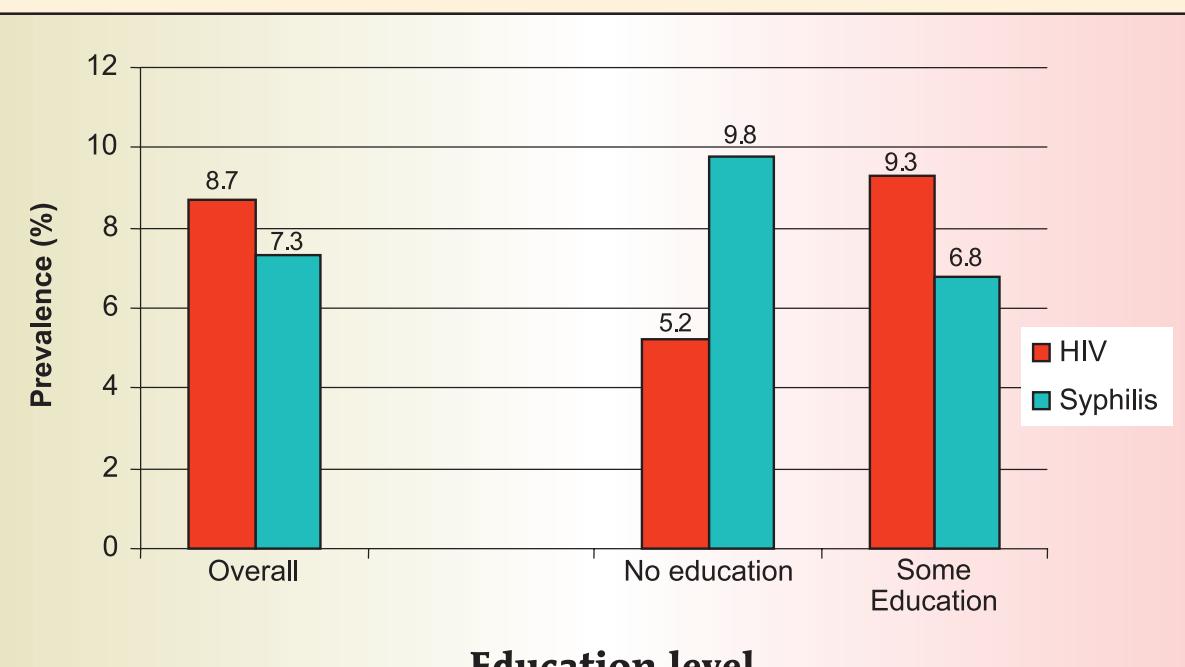


Fig 2.5: Prevalence of HIV and syphilis among ANC Attendees by education status, Tanzania, 2003/04

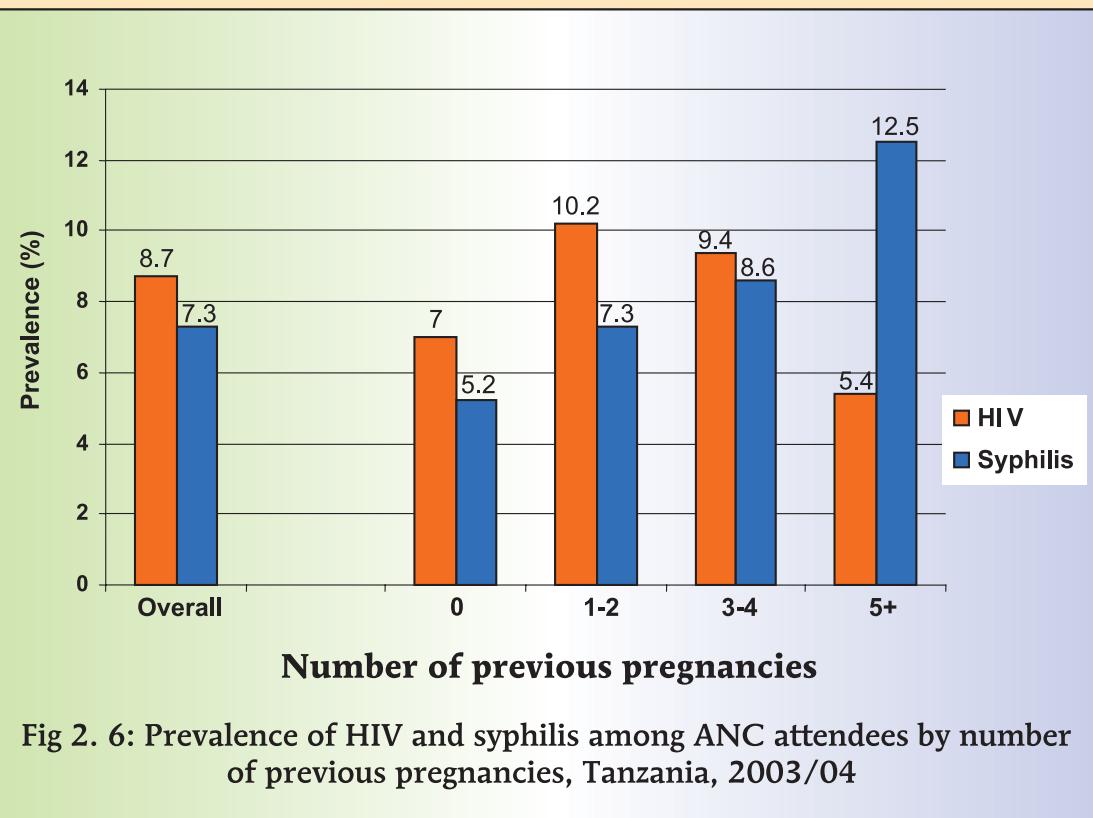


Fig 2. 6: Prevalence of HIV and syphilis among ANC attendees by number of previous pregnancies, Tanzania, 2003/04

Syphilis prevalence

A total of 17,323 ANC attendees were tested for syphilis during the study period. A total of 1,265 women tested positive, an overall syphilis prevalence of 7.3% (95% CI = 6.9-7.7). Syphilis infection prevalence ranged from a low of 2.1% (95% CI = 1.4,3.0) in Kigoma region to a high of 14.9% (95% CI = 13.3,16.6) in Kagera region where interestingly, the HIV prevalence was found to be the lowest (Fig 2.1).

The prevalence of syphilis was highest among attendees from roadside clinics 16.0% (95% CI = 13.3-18.9) than those from rural clinics 10.5% (95% CI = 9.5-11.5) and lowest among urban clinic attendees 5.8% (95% CI = 5.4-6.3). Women living in rural areas had higher prevalence than those in urban areas ($p<0.0001$) (Figure 2.2). Marital status did not appear to influence the prevalence of syphilis (Fig 2.4). The age specific prevalence of syphilis were 6.5% for age group 15-24, 7.8% for age group 25-34 and 10.4% for age group 35-49 (Fig 2.3). The observed differences in age-specific prevalence were statistically significant ($p<0.001$), suggesting that there was a higher likelihood of having syphilis for women aged >34 years compared to those less than 34 years of age (Fig 2.3). As in previous years, in contrast to women with HIV, women with no education were more likely to be infected with syphilis than were women with some education ($p<0.0001$) (Fig 2.5). Overall, 130/17,813 (0.7%) of clinic attendees were co-infected with syphilis and HIV.

When the HIV results of this surveillance are compared with those of the first ANC survey conducted in 2001/2002 (Table 2) we notice a decrease in prevalence in Dar es Salaam and Mtwara, with the other regions having no significant change. The HIV prevalence among women attending border clinics fell from 17.3% to 15.3%. However, these changes are rather small and are probably a result of random variation in the different regions and sites. The overall prevalence of syphilis was 7.3%, which compares with 8.2% reported in the last surveillance

conducted in 2001/2002 (Table 3). In keeping with previous ANC surveillance report the prevalence of syphilis was higher among women without formal education and those aged 34 years, and there was no association with marital status (Table 3).

Table 2.2: HIV prevalence data of the ANC surveillance studies conducted in 2001/2002 and 2003/2004

	ANC Surveillance 2001/2002	ANC Surveillance 2003/2004
	HIV Prevalance(%)	HIV Prevalance(%)
Region		
Dar es Salaam	12.8	10.8
Dodoma	6.1	7.8
Kagera	5.6	4.8
Kilimanjaro	6.3	5.7
Mbeya	16	15.3
Mtwara	7.1	5.2
Kigoma	ND	5.1
Lindi	ND	7.1
Morogoro	ND	9.0
Tanga	ND	9.2
Residence		
Urban	12.1	11.2
Semi-urban	3.7	4.7
Roadside	10.3	9.1
Border	17.3	15.3
Rural	4.1	3.7
Peak age	25-34	25-34
Education		
None	6.4	5.2
Some education	10.2	9.3
Marital status		
Married	9.1	8.6
Single	12.6	9.7
Overall Prevalence	9.6	8.7

ND = No Data

Table 2.3: Syphilis data from ANC surveillance studies conducted in 2001/2002 and 2003/2004

	ANC Surveillance 2001/2002	ANC Surveillance 2003/2004
Region		
<i>Dar es Salaam</i>	4.8	5.1
<i>Dodoma</i>	12.3	8.4
<i>Kagera</i>	9.3	14.9
<i>Kilimanjaro</i>	3.0	6.3
<i>Mbeya</i>	10.7	6.2
<i>Mtwara</i>	10.5	9.1
<i>Kigoma</i>	ND	2.1
<i>Lindi</i>	ND	7.1
<i>Morogoro</i>	ND	12.0
<i>Tanga</i>	ND	3.3
Residence		
<i>Urban</i>	5.1	5.8
<i>Semi-urban</i>	13.3	6.8
<i>Roadside</i>	9.7	16.0
<i>Border</i>	13.4	7.0
<i>Rural</i>	4.1	10.5
Peak age	+35	+35
Education		
<i>None</i>	11.5	9.8
<i>Some education</i>	7.5	6.8
Marital status		
<i>Married</i>	8.2	7.3
<i>Single</i>	8.2	7.8
Overall Prevalence	8.2	7.3

ND = No Data

2.2 Surveillance population: Blood Donors

Introduction

Persons donating blood in health care facilities constitute the surveillance population of blood donors. After donation or before blood is given to patients, screening for HIV infection is done in order to ensure provision of safe blood. HIV screening of the potential transfusion blood has been in place since 1987. This service which was originally limited to regional and referral hospitals was later extended to cover all health care facilities providing blood transfusion services so as to ensure provision of safe blood.

Methods

During 2004, information was collected from a total of 163 health care facilities distributed throughout the 21 regions of Tanzania mainland. Screening for HIV infection is done by using either simple/rapid tests in almost all health care facilities except a few regional, referral and some missionary hospitals where ELISA testing strategy is used. Test results and blood donor demographic information (age, sex, residence and type of donor) are filled in the blood donor HIV register forms made available to the health care facilities from the NACP through the RMOs. Duly filled forms are then returned to the NACP for data entry, cleaning, analysis and reporting.

Characteristics of blood donors

A total of 154,045 individuals donated blood during the year 2004, all individuals were aged more than 15 years (age range 15-66 years) and therefore all were included in the analysis. Majority of blood donors were in the age group 25-34 years (44.4%) followed by 35 years plus (29.9%) and 15-24 years (25.7%). The majority of donors were males constituting up to 83.7 percent of all donors the rest being females. As it has been for the past years, the majority of blood donors were relatives of patients (98.95%), the rest being institutional (0.55%), paid (0.48%) and volunteer (0.01%) donors. Institutional donors were from secondary schools, colleges and a few from prisons.

Trends of HIV infection among blood donors

From a total of 154,045 blood donors during 2004, 25,076 individuals were found to be HIV positive resulting into an overall prevalence of 7.7% (95%CI=7.5-7.8). This is a decrease of 1.1% compared to the 2003 estimate of 8.8% ($p<0.0001$). This is the third year running since 2002; when a decrease in prevalence was first noted among blood donors. The decrease in prevalence may reflect the decrease in the epidemic or it may be due to alternative explanations that include deaths, migration and self exclusion of those HIV infected. In the era of ARV delivery one would expect a constant or even a rise in prevalence of HIV infection if incidence remains constant, but in case of blood donors this may not apply because individuals who know that they are HIV positive and may be on ARVs are unlikely to donate blood.

The sex specific prevalence as in the previous year was higher among females at 10.7% ($N=25,076$) compared to that of 7.2% ($N=128,969$) among males ($p<0.0001$). There was a statistically significant decrease in the sex specific prevalence estimates when the figures for 2004 were compared to those of 2003. Prevalence among females decreased from 11.9% in 2003 to 10.7% in 2004 ($p=0.0001$) the corresponding decrease among males was from 8.2% in 2003 to 7.2% in 2004 ($p=0.00001$), figure 2.7 below details the trends over a seven year period.

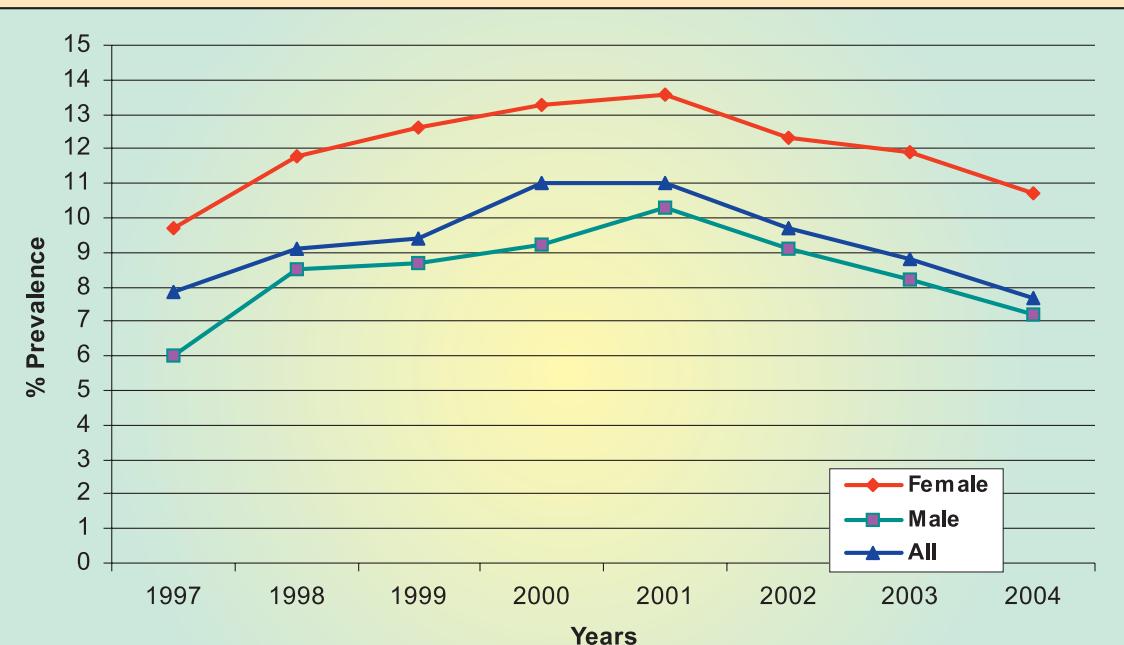


Fig 2.7 Prevalence of HIV infection among Blood Donors year 1997 – 2004

Prevalence varied by donor type, it was highest among relative donors at 7.7% ($N=152,435$) followed by institutional donors at 6.5% ($N=847$) and was lowest among paid donors at 5.2% ($N=747$), $p=0.01$. Prevalence among volunteer donors did not make any meaningful interpretation due to small numbers in this group ($N=16$).

Age and sex specific HIV infection trends

The following line graph illustrates trends in the age and sex specific prevalence of HIV infection among the blood donor population for the years 1996 to 2004.

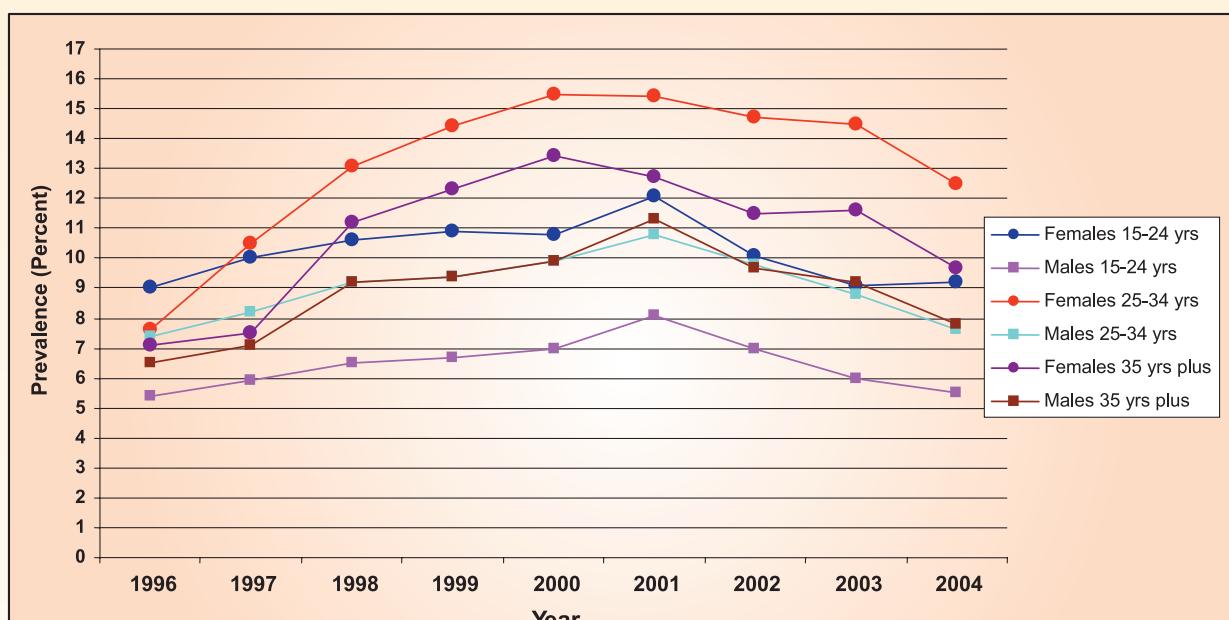


Fig 2.8: Age and sex specific trends of HIV infection, Tanzania, 1996-2004

Between 2003 and 2004, prevalence in all age groups showed a decreasing trend except among females in the age group 15-24 years whose prevalence virtually remained constant.

The aberrant trend in this age group calls for further investigation to establish whether the rate of new infections in this age group is on the increase compared to other age groups and especially males of a similar age. (Note: prevalence in the younger age groups may approximate incidence) Figure 2.9 gives further details regarding these trends.

The following figures 2.9-2.12 show the age and sex specific prevalence trends of HIV infection among blood donors for a 17 years period from 1987 to 2004. Data is presented in five year age-groups covering the age range of 15 to 54 years. For ease of presentation, each figure displays information covering a 10 year age interval using a common scale to facilitate comparisons. This is a further breakdown of the sex and age specific data presented in figure 2.8 above.

Over a 14 year period, a gradual rise in the prevalence of HIV infection is noted with increasing age especially after the year 1994 to a peak level during 2000 and 2001. From the year 2002 a gradual descent is noted for most age-groups. Referring back to figure 2.8 where no change in prevalence was noted among females aged 15-24 years during 2003 and 2004, breaking down this age group into 5 year age intervals, it is noted that actually prevalence among females aged 15-19 years rose while that among females aged 20-24 years decreased (figure 2.9). This finding is a warning sign that new infections are increasing in this age group that previously indicated the contrary. Efforts to minimize infection in this age group should be increased tremendously in order to regain the previous successes and prevent resurgence of the epidemic.

Prior to 1994, the epidemic trend seems undefined. This may be due to several reasons including changes in HIV testing strategies among blood donors, inaccurate and incomplete reporting system and inconsistencies in data handling at various levels.

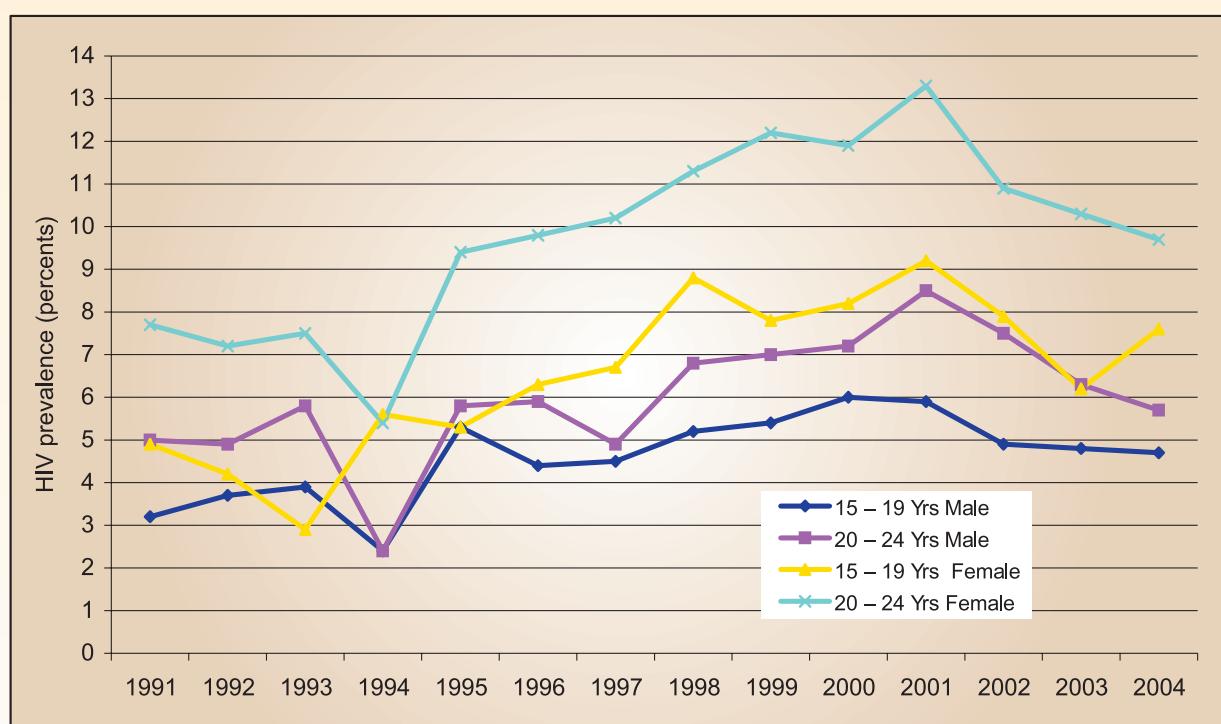


Fig 2.9 Age and sex specific prevalence of HIV infection among blood donors aged 15-24 years, 1991-2004

The general downward trend of the epidemic noted among blood donors needs to be confirmed through proper epidemiological studies which should also shed light on the possible reasons of the observed trends.

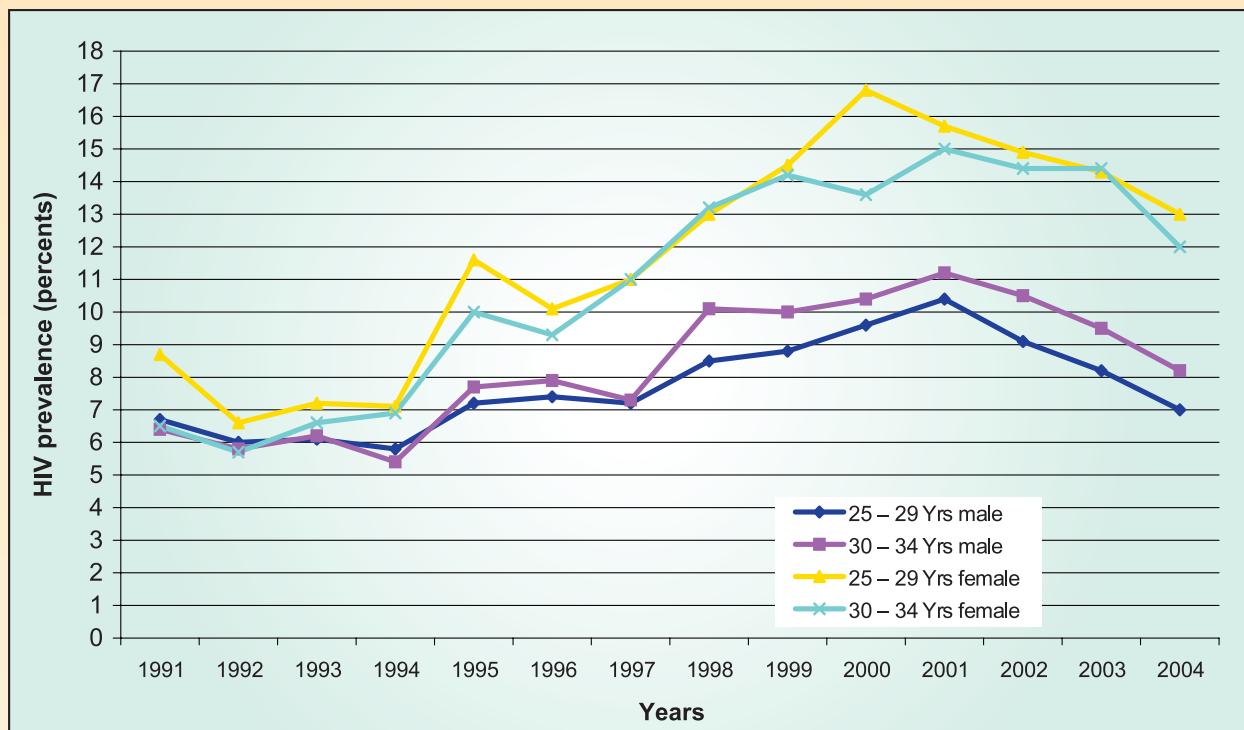


Fig 2.10 Age and sex specific prevalence of HIV infection among blood donors aged 25-34 years, 1991-2004

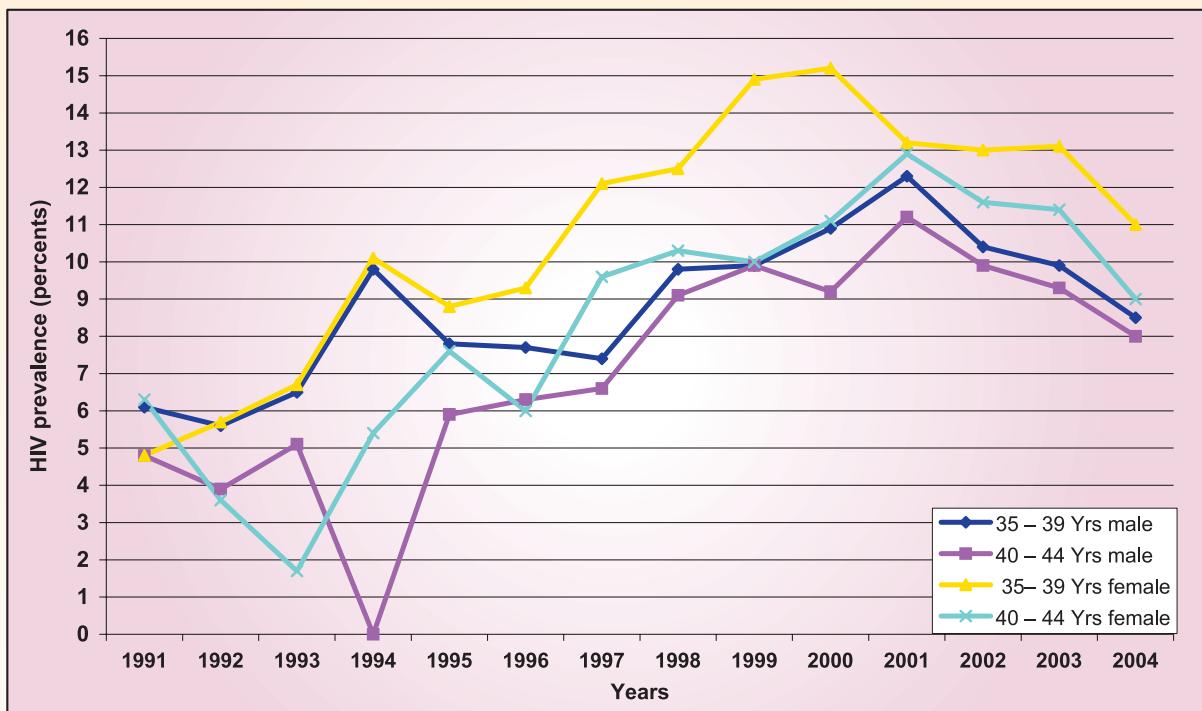


Fig 2.11 Age and sex specific prevalence of HIV infection among blood donors aged 35-44 years, 1991-2004

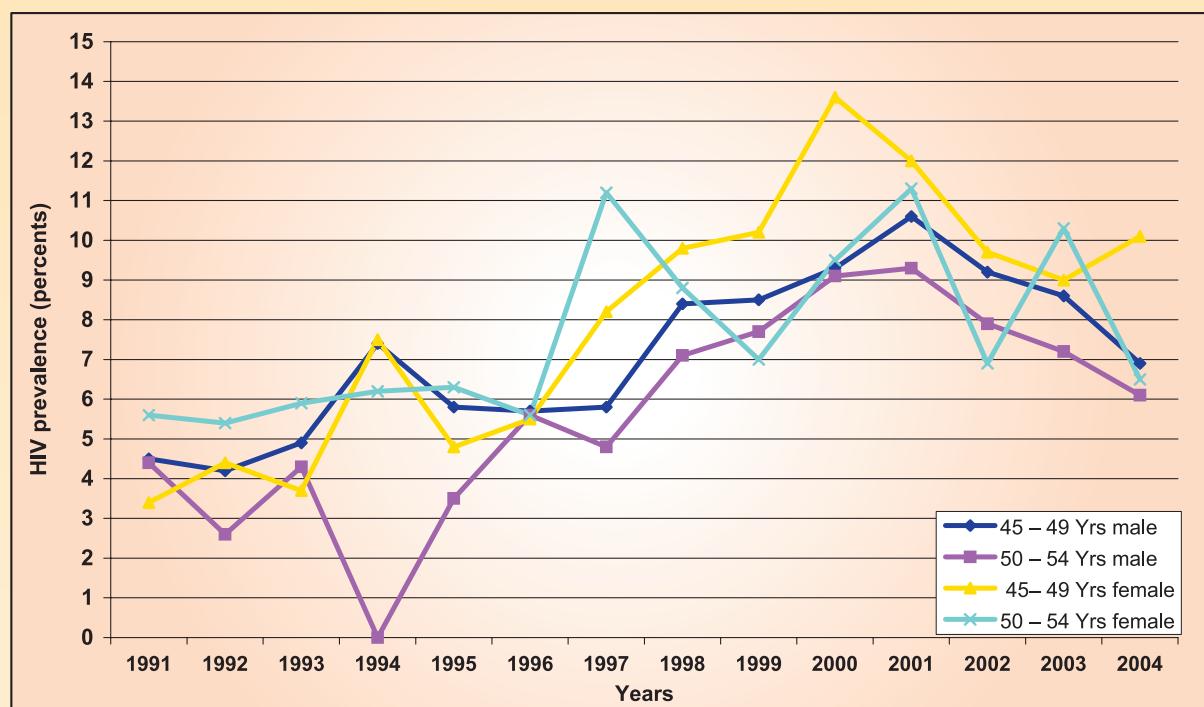


Fig 2.12 Age and sex specific prevalence of HIV infection among blood donors aged 45-54 years, 1991-2004

To keep track of the exact age and sex specific prevalence figures, the following tables (2.5 and 2.6) are added in for this purpose. Similar information however may better be interpreted in the preceding graphs.

Table 2.5 Age-specific prevalence (%) of HIV infection among male blood donors. Tanzania, 1991 – 2004

Age	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
15-19	3.2	3.7	3.9	2.4	5.3	4.4	4.5	5.2	5.4	6.0	5.9	4.9	4.8	4.7
20-24	5.0	4.9	5.8	2.4	5.8	5.9	4.9	6.8	7.0	7.2	8.5	7.5	6.3	5.7
25-29	6.7	6.0	6.1	5.8	7.2	7.4	7.2	8.5	8.8	9.6	10.4	9.1	8.2	7.0
30-34	6.4	5.8	6.2	5.4	7.7	7.9	7.3	10.1	10.0	10.4	11.2	10.5	9.5	8.2
35-39	6.1	5.6	6.5	9.8	7.8	7.7	7.4	9.8	9.9	10.9	12.3	10.4	9.9	8.5
40-44	4.8	3.9	5.1	0.0	5.9	6.3	6.6	9.1	9.9	9.2	11.2	9.9	9.3	8.0
45-49	4.5	4.2	4.9	7.4	5.8	5.7	5.8	8.4	8.5	9.3	10.6	9.2	8.6	6.9
50-54	4.4	2.6	4.3	0.0	3.5	5.6	4.8	7.1	7.7	9.1	9.3	7.9	7.2	6.1
55+	4.0	2.3	5.2	12.5	2.5	4.4	5.9	8.2	5.5	6.8	7.6	6.3	6.7	6.8
Total	5.8	5.3	5.9	4.8	6.7	6.9	6.0	8.5	8.7	9.2	10.3	9.1	8.2	7.2

Table 2.6 Age-specific prevalence (%) of HIV infection among female blood Donors, Tanzania 1991 – 2004

Age	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
15–19	4.9	4.2	2.9	5.6	5.3	6.3	6.7	8.8	7.8	8.2	9.2	7.9	6.2	7.6
20–24	7.7	7.2	7.5	5.4	9.4	9.8	10.2	11.3	12.2	11.9	13.3	10.9	10.3	9.7
25–29	8.7	6.6	7.2	7.1	11.6	10.1	11.0	13	14.5	16.8	15.7	14.9	14.3	13.0
30–34	6.5	5.7	6.6	6.9	10.0	9.3	11.0	13.2	14.2	13.6	15.0	14.4	14.4	12.0
35–39	4.8	5.7	6.7	10.1	8.8	9.3	12.1	12.5	14.9	15.2	13.2	13.0	13.1	11.0
40–44	6.3	3.6	1.7	5.4	7.6	6.0	9.6	10.3	10.0	11.1	12.9	11.6	11.4	9.0
45–49	3.4	4.4	3.7	7.5	4.8	5.5	8.2	9.8	10.2	13.6	12.0	9.7	9.0	10.1
50–54	5.6	5.4	5.9	6.2	*6.3	5.6	11.2	8.8	7.0	9.5	11.3	6.9	10.3	6.5
55+	6.7	4.2	5.3	3.3	*16.7	7.1	7.6	7.8	8.8	9.7	10.3	5.2	9.1	3.3
Total	7.2	5.9	6.3	6.9	9.2	8.7	9.7	11.8	12.6	13.3	13.6	12.3	11.9	10.7

HIV infection trends by regions and districts

The prevalence of HIV infection varies by regions and districts. To enable geographical assessment of the trend of the epidemic, data is presented in Tables 2.7-2.9 by region and by district. The same information has been shown graphically at region level in a set of graphs (Figure 2.15a-e). The graphs bear the same scale for ease of comparison.

There has been a change in the region with the highest prevalence when 2003 data is compared to that of 2004. HIV prevalence rose in Rukwa region from the former prevalence of 17.9% in 2003 to 19.5% in 2004 resulting into the region with the highest prevalence during 2004. The other regions in decreasing prevalence of HIV infection include: Kagera 18.2%, Mbeya 13.3%, Arusha 12.9% and Iringa 12.1%.

Muleba district continued to have the highest prevalence of HIV infection at 33.7% followed by Nkasi at 32.1%, Ludewa 26.5%, Kinondoni 18.8% and Chunya 17.7% in this decreasing order. Muleba, Nkasi and Kinondoni exhibited a rising trend compared to the previous year while Chunya showed a decrease in the prevalence. No information was available for Ludewa district during 2003. For details regarding the trend of the epidemic for other regions and districts refer to Table 2.7 and figures 2.13a-e.

Table 2.7: Prevalence of HIV infection among blood donors by region and district, Tanzania 1999-2004

Region	District	Year 1999		Year 2000		Year 2001		Year 2002		Year 2003		Year 2004	
		Total donors	% prev										
Arusha		3,030	22	7,223	13.8	6,827	17.8	—	—	2,095	11.1	2072	12.9
	Arumeru	—	—	—	—	72	—	—	—	—	—	132	1.5
	Arusha municipality	—	—	1,372	9.1	1,825	11.2	1,456	8.9	1,608	12.7	1505	16.6
	Karatu	—	—	—	—	—	—	—	—	292	3.1	343	2.3
	Monduli	112	0	152	11.8	119	10.1	165	10.9	138	12.3	92	8.7
	Ngorongoro	—	—	—	—	—	—	—	—	57	5.3	—	—
Manyara		—	—	—	—	—	—	—	—	4,780	12	4450	6.3
	Babati	2,095	30.4	4,132	19.1	2,428	33.9	3,676	23.7	2,224	18.6	1419	4.7
	Hanang	—	—	—	—	223	18	279	13.6	210	14.3	335	15.2
	Kiteto	—	—	64	10.9	266	11.7	537	10.6	579	10.5	858	3.7
	Mbulu	809	3.6	1,503	3.7	1,892	7.5	1,601	7.8	1,767	4	1938	2.9
Coast		3,510	8.9	3,160	12.5	3,240	10.4	4,470	9.6	4,688	7	3351	6.4
	Bagamoyo	320	5.9	463	7.8	236	13.6	282	14.2	692	3.3	658	9.4
	Kibaha	1,730	10.6	664	11.9	1,147	9.1	2,286	8.9	2,113	7	782	5.8
	Kisarawe	112	9.8	452	19	281	8.2	—	—	145	11	—	—
	Mafia	256	8.2	249	8	292	5.8	384	4.7	249	1.6	381	3.1
	Rufiji	1,092	7.1	1,318	13.1	1,284	12.5	1,518	11.1	1,489	9.3	1530	6.3
DSM		694	33.1	1,739	8.6	1,956	18.8	3,547	12	4,923	10	2572	7.9
	Ilala	428	45.1	1,005	9.7	1,351	14.7	1,536	6.3	2,125	6.9	2348	6.9
	Kinondoni	162	12.4	658	5.5	153	33.3	1,295	15.1	1,833	10.3	224	18.8
	Temeke	—	—	—	—	452	25.9	716	18.4	965	16.3	—	—
Dodoma		2,269	5.1	3,001	3.9	8,984	7.9	4,351	7.6	3,933	7	4390	5.7
	Dodoma municipality	1,364	4.8	1,129	5.6	4,249	13.2	2,280	6.9	2,251	4.6	1125	5.2
	Kondoa	—	—	797	4.9	1,122	4.4	855	3.7	785	6.6	1034	6.2
	Kongwa	—	—	—	—	441	7.3	1,216	11.7	897	13.3	1004	7.6
	Mpwapwa	905	5.4	1,075	1.5	3,172	2.3	—	—	—	—	1227	4.4
Iringa		4,258	14.7	2,393	14.6	5,104	18.7	3,450	14.8	2,115	15.4	2163	12.1
	Iringa municipality	2,643	14.3	1,008	14.7	3,057	21.4	1,911	16.6	1,431	14.2	1453	9.7
	Ludewa	280	22.1	415	15.2	534	18.4	165	17.6	—	—	298	26.5
	Mafinga	—	—	—	—	96	10.4	—	—	181	14.9	—	—
	Mufindi	297	8.1	301	8.9	62	3.2	318	6.6	83	3.6	412	10.2
	Njombe	1,038	15.7	669	16.6	1,355	13.9	1,056	13.7	420	22.1	—	—
Kagera		4,572	17.7	3,827	19.5	5,753	22	5,965	18	4,699	20.7	6060	18.2
	Biharamulo	428	19.6	413	8.5	350	10.6	947	6.7	729	11.8	852	15.5
	Bukoba	1,615	20.7	650	12.2	1,577	12.7	1,501	13.1	836	13	309	12
	Karagwe	638	20.8	998	19.5	1,183	17.4	1,585	19.2	871	24.8	2732	17.6
	Muleba	1,159	15.5	1,472	24.6	1,843	33.7	1,403	31.1	1,246	29.3	858	33.7
	Ngara	732	10.4	294	25.8	800	25.4	529	14	1,017	19.2	1309	12.3

Region	District	Year 1999		Year 2000		Year 2001		Year 2002		Year 2003		Year 2004	
		Total donors	% prev										
Kigoma		6,860	6.4	6,772	3.8	7,412	4.9	3,935	3.2	8,124	4.8	9049	3.1
	Kasulu	4,935	6.8	3,503	3.5	3,918	3.7	3,200	3	3,029	2.7	3841	2.8
	Kibondo	752	4.5	530	6.2	543	4.6	142	0	1,135	1.4	945	2.6
	Kigoma	1,173	5.7	2,739	3.8	2,951	6.5	593	4.9	3,960	7.4	4263	3.6
Kilimanjaro		5,218	4.8	4,435	6.7	4,823	5.9	4,125	6.8	3,334	4.8	3499	4.5
	Hai	—	—	416	10.1	310	1.6	15	—	—	—	—	—
	Moshi	3,233	5.4	2,221	6.4	2,948	5.6	2,792	7.4	2,041	4.2	2466	4.3
	Mwanga	277	3.6	115	7	162	10.5	202	3	166	5.4	169	7.1
	Rombo	305	2.9	222	3.3	302	2.6	372	2.4	238	4.2	97	2.1
	Same	1,369	4.2	1,461	6.8	1,101	8	744	8.2	889	6.3	767	4.8
Lindi		7,083	3.4	5,092	4.2	6,046	3.8	5,856	3.6	5,308	3.8	5645	3.6
	Kilwa	879	5.6	478	3.1	656	5	673	4.2	812	5.5	1021	3.6
	Lindi	2,788	5.1	2,175	4.5	2,159	4	2,367	3	1,858	4.7	2041	4
	Liwale	986	1.3	931	3.6	837	3.9	638	3.9	787	2.7	879	3.1
	Nachingwea	2,430	1.6	1,508	4.4	2,394	3.3	2,069	2.8	1,587	2.4	1269	3.4
	Rwangwa	—	—	—	—	—	—	—	—	264	4.9	435	4.1
Mara		5,151	9.2	10,676	9.4	9,277	9	10,709	10.3	8,108	7.8	11732	5.9
	Bunda	262	9.9	2,416	10.7	2,495	9	2,391	9.1	584	16.3	3889	4.7
	Musoma	2,835	8	4,230	7.6	4,670	7.5	2,943	9.5	4,994	8.5	4846	6.3
	Serengeti	988	6.3	1,335	2.9	1,042	2.1	1,567	2.7	1,657	2.5	1641	3.3
	Tarime	1,066	14.7	2,695	14.3	1,070	22.2	3,794	14.9	873	8.6	1356	11.1
Mbeya		6,691	15.2	7,338	17	10,618	16.4	7,462	12.7	7,957	14.8	7144	13.3
	Chunya	865	17.8	868	19.9	1,938	20	1,207	17.9	1,688	26.5	1707	17.7
	Ileje	218	13.8	211	11.9	190	11.6	125	2.4	138	5.8	80	6.3
	Kyela	750	13.6	1,110	16.4	1,671	15.7	1,388	17	1,408	14.1	1675	16.4
	Mbarali	1,470	18.3	1,683	25.4	1,868	20.3	946	14.4	1,033	15.8	925	14.7
	Mbeya	1,254	16.3	1,153	18.3	1,390	13.3	1,093	7.5	1,368	5.6	1134	3
	Mbozi	635	16.4	566	11.1	934	11.7	741	16.3	974	17.4	837	13.3
	Rungwe	1,499	10.5	1,747	9.6	2,627	15.1	1,962	7.9	1,348	8.3	786	10.7
Morogoro		12,389	11.3	7,606	16.6	12,755	17.2	9,764	8.6	10,140	8.3	12387	8
	Kilombero	2,697	18.1	1,671	35.3	3,334	34.6	2,346	11.5	2,867	14.4	4039	10.2
	Kilosa	4,435	11.7	1,309	6.9	3,581	8.7	3,173	6.1	2,265	3.7	2969	4.9
	Mahenge	—	—	—	—	—	—	—	—	14	0	—	—
	Morogoro	4,440	8.2	4,072	12.1	4,964	13.5	2,887	10.4	1,685	7.1	1905	6.7
	Mvomero	—	—	—	—	—	—	—	—	1,763	12	1753	16.2
	Ulanga	805	3.7	540	15.4	876	6.4	849	1.9	1,546	1	1721	1.5
Mtwara		3,030	7.8	8,665	8.2	5,767	7.5	6,476	6.8	4,833	6.5	3541	4.7
	Mtwara urban	739	4.5	139	7.2	1,994	4.6	1,971	5.3	1,522	5.4	618	2.9
	Masasi	2,291	8.9	3,725	10.1	2,955	9.8	2,981	8.3	2,497	7.7	2721	5.3
	Mtwara rural	—	—	3,182	7.2	—	—	—	—	—	—	—	—
	Newala	—	—	1,619	5.7	818	6.2	1,493	6	650	5.5	—	—
	Tandahimba	—	—	—	—	—	—	—	—	164	1.8	202	2.5

Region	District	Year 1999		Year 2000		Year 2001		Year 2002		Year 2003		Year 2004	
		Total donors	% prev										
Mwanza		10,373	7	9,858	7.6	12,526	8	16,672	7.7	15,235	8.7	11,151	8.9
	Geita	832	8.8	1,173	7	1,942	6.2	2,228	7.2	2,289	7.3	2,238	8.3
	Kwimba	1,977	4.9	1,171	4.4	1,293	7.8	2,685	7.1	2,714	7.4	2,784	6.4
	Magu	1,436	9.5	1,243	12.6	1,539	13	2,214	12.2	2,571	14.6	3,544	10.8
	Misungwi	372	3.2	444	5.6	491	6.3	1,111	5.2	1,124	5.1	222	12.2
	Mwanza	2,561	5.8	2,377	8.2	3,061	7.6	3,544	6.3	4,148	5.4	813	11.8
	Sengerema	2,518	7.5	2,868	6.5	3,406	7.2	3,400	6.1	235	8.5	—	—
	Ukerewe	677	10.6	558	10	772	10	1,490	11.3	2,154	13.2	1,550	7.9
Rukwa		—	—	3,277	11.8	531	10.7	1,829	9.8	1,749	17.9	2381	19.5
	Mpanda	—	—	565	12.2	341	8.8	375	7.5	—	—	1854	9.8
	Nkasi	—	—	652	15.6	—	—	927	9.9	1,355	18.4	1427	32.1
	Sumbawanga	—	—	2,045	10.6	190	14.2	527	11.4	394	16.2	—	—
Ruvuma		8,301	9.8	9,813	10.2	12,187	11.2	14,965	10.9	12,318	10.3	13127	8.1
	Mbinga	3,502	7.5	3,618	9.4	3,646	11.4	5,370	10.1	3,950	8.8	4155	8.8
	Songea	3,460	13.8	4,605	12.4	5,678	14.3	6,919	13.7	6,003	13.5	5965	9.4
	Tunduru	1,339	5.3	1,590	6	2,863	4.8	2,663	5.3	2,365	4.4	3007	4.4
Shinyanga		8,654	8.2	9,332	9.4	12,316	8.4	15,603	8.3	19,748	7	19267	7.3
	Bariadi	2,676	4.2	1,580	4.8	2,569	6.2	4,045	6.1	9,754	4.9	5037	3.9
	Kahama	2,534	10.2	2,344	9.6	3,754	8.6	5,632	7.8	4,743	9.4	6400	8.5
	Maswa	690	9.3	908	9	1,239	10.1	1,800	9	1,059	6.6	1813	8.3
	Meatu	426	10.3	307	10.1	569	12	799	8.1	436	12.4	—	—
	Shinyanga	2,328	9.9	4,185	11.1	4,185	8.6	3,327	11.5	3,756	9	6017	8.6
Singida		4,187	8.1	5,326	8	6,785	11.8	5,896	10.9	4,962	7.6	5213	5.7
	Iramba	181	5.5	1,095	12	710	5.2	737	14.2	537	8.6	875	6.4
	Kiomboi	—	—	—	—	14	7.1	—	—	—	—	—	—
	Manyoni	877	7.1	1,864	7.4	2,024	8.3	2,335	6.6	2,042	5.5	2604	4.9
	Singida urban	3,129	8.6	2,367	6.8	3,557	13	2,269	14.9	2,383	9.2	1734	6.7
	Singida rural	—	—	—	—	480	27.5	552	8.3	—	—	—	—
Tabora		11,335	7.1	9,084	7.2	9,628	7.6	7,973	6.6	9,052	8.4	12314	6.5
	Igunga	4,120	7	2,359	7.6	2,427	8.2	3,379	7.3	3,137	8.8	2520	9.2
	Nzega	1,812	6.4	1,604	5.4	3,156	5.7	2,172	4.3	3,076	7.6	3403	7
	Sikonge	892	5.7	875	5	1,043	6.7	1,210	6.4	1,317	6.1	1647	5.3
	Tabora	2,918	7.8	2,445	7.8	1,487	8.1	—	—	—	—	3201	5
	Urambo	1,593	7.7	1,801	8.8	1,515	10.8	1,197	9	1,522	11.3	1543	5.3
Tanga		10,967	8.3	9,749	8.8	9,583	8.6	6,100	9.8	9,276	7.4	11637	5.9
	Handeni	1,531	9.7	1,296	5.3	1,937	3.5	799	1.9	1,571	2.9	1840	2.6
	Kilindi	—	—	—	—	—	—	—	—	—	—	499	0
	Korogwe	1,945	9	1,034	6.1	795	6.8	—	—	1,798	6.4	1839	3.7
	Lushoto	450	22.2	811	13.2	537	11	179	11.2	916	15.1	1338	9
	Muheza	2,667	8.1	1,712	10.2	2,463	9.1	1,537	6.4	1,036	6.5	2381	7.2
	Pangani	621	5.5	1,169	5.7	509	4.7	545	4.8	1,345	5.5	1237	5.1
	Tanga	3,753	6.3	3,727	10.1	3,342	11.7	3,040	14.4	2,610	9.5	2503	8.7

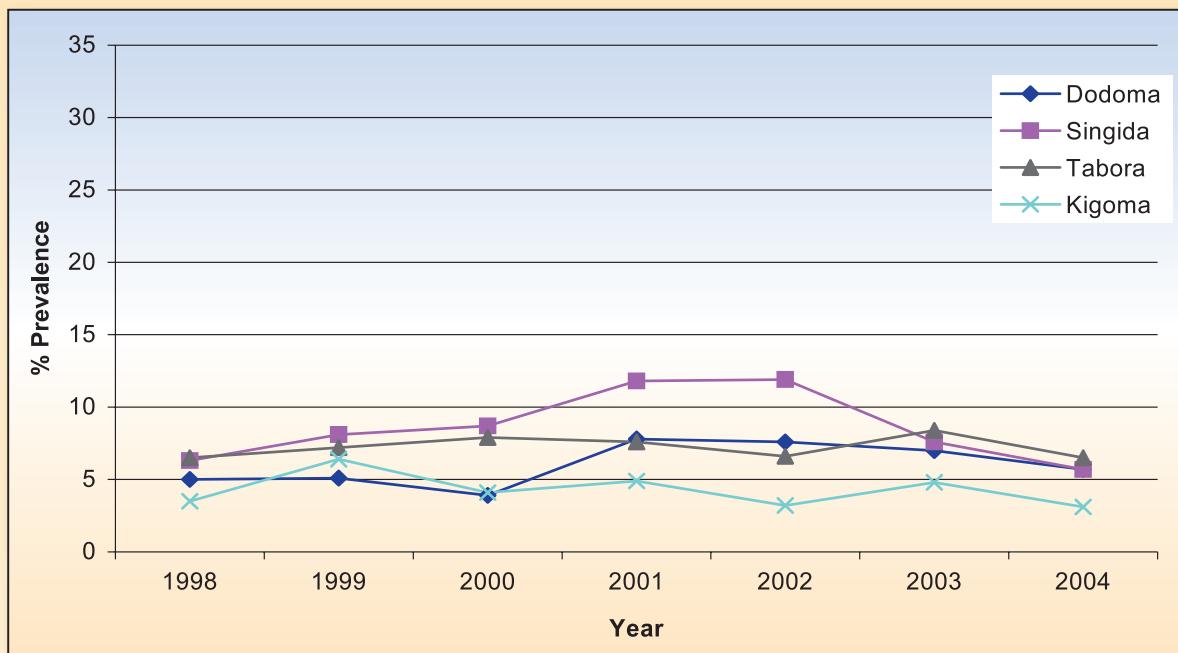


Fig 2.13a Region specific trends of HIV prevalence among blood donors, Tanzania, 1998-2004

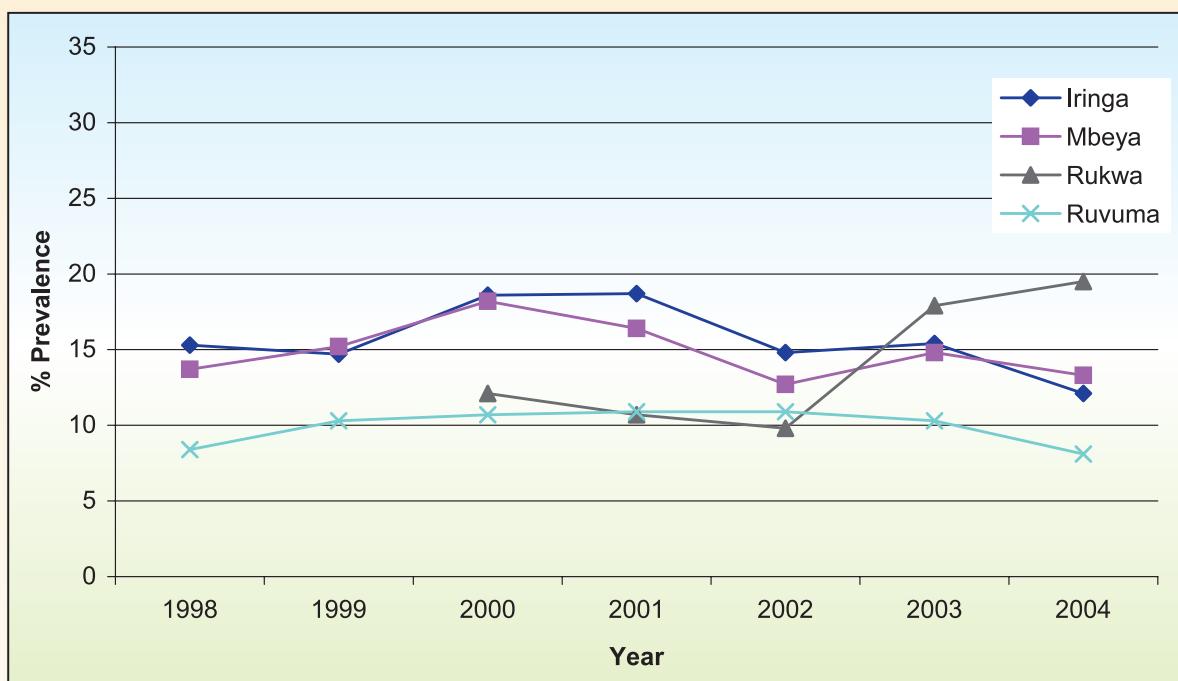


Fig 2.13b Region specific trends of HIV prevalence among blood donors, Tanzania, 1998-2004

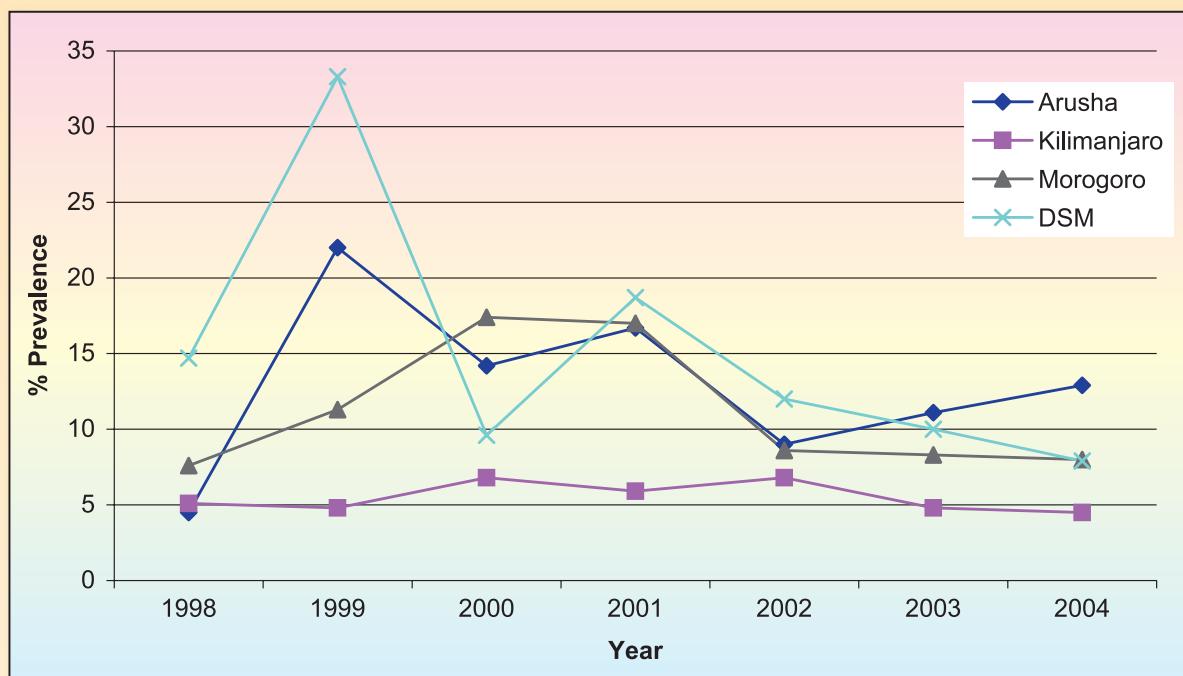


Fig 2.13c Region specific trends of HIV prevalence among blood donors, Tanzania, 1998-2004

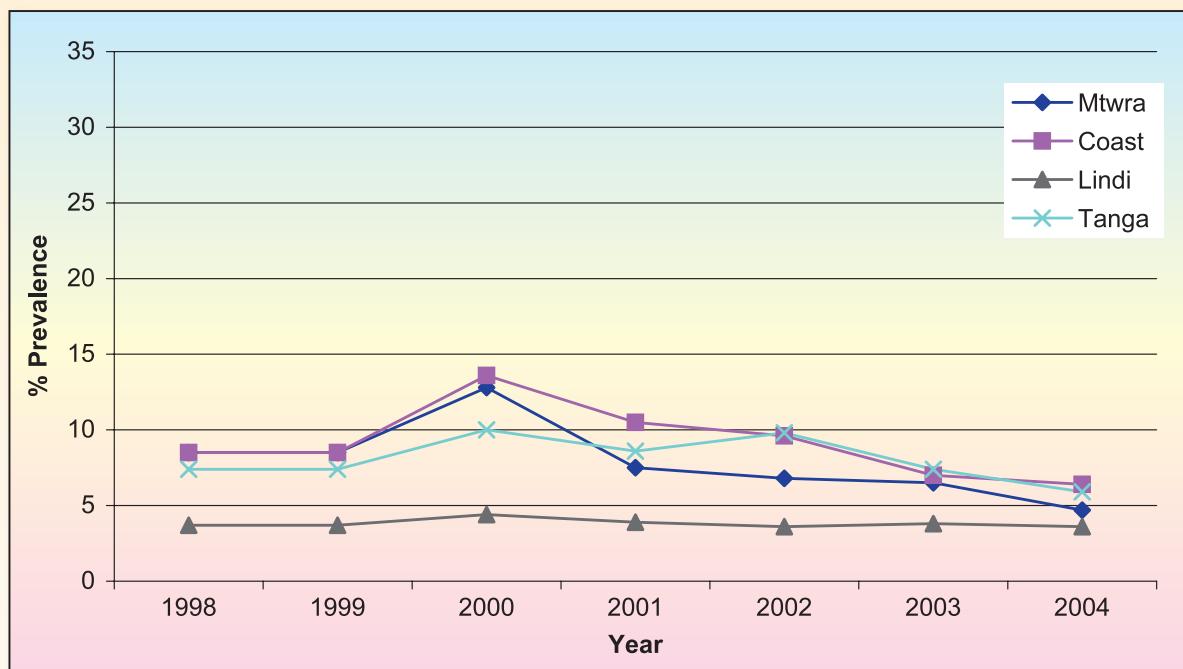


Fig 2.13d Region specific trends of HIV prevalence among blood donors, Tanzania, 1998-2004

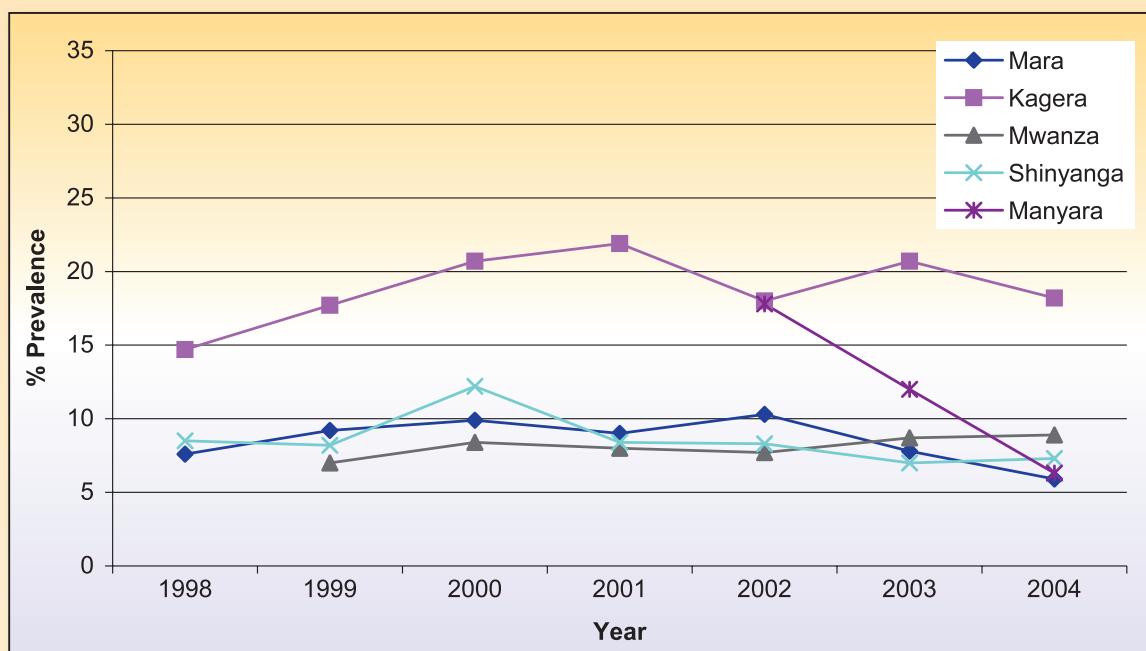


Fig 2.13e Region specific trends of HIV prevalence among blood donors in the five Zones of Tanzania, 1998- 2004

Table 2.8: Prevalence of HIV infection among male blood donors by region, Tanzania 1992–2004

Region	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Arusha	2.6	2.6	2.7	6.1	3	2.8	4.2	21.3	13.4	17.2	8.7	9.4	11.7
Coast	4.1	5.9	6.6	5.5	9.4	8.2	7.7	7.5	10.1	8	8.3	5.9	5.7
Dodoma	2.8	1.7	0	0	4.9	7.9	4.9	5	3.7	7.8	7.6	6.9	5.7
DSM	8.5	—	—	4.9	17.2	19.8	12.5	23.8	8.3	18.2	11.2	9.5	7.5
Iringa	11.1	13.2	7.7	13	14.2	14.2	14.8	14.7	13.7	17.9	14.1	14.9	11.8
Kagera	10.9	5.8	7.9	10.8	8	8.6	14.8	17.3	19.5	22.3	18.6	21.0	18.5
Kigoma	1.9	7	3.4	4.9	5.6	2.8	3.8	6.3	3.9	4.8	3.2	4.3	3.0
Kilimanjaro	2.4	3.4	1.5	10.7	4.1	4.1	4.8	4.7	6.2	5.8	6.9	4.1	4.1
Lindi	3.7	2.5	—	3	3.7	3	3.3	3.3	3.9	3.2	3	3.1	3.3
Manyara	—	—	—	—	—	—	—	—	—	—	17.5	10.6	5.2
Mara	6.9	5	3.7	5.8	7.6	8	7.6	8.6	8.7	7.8	8.7	7.4	4.9
Mbeya	15.1	0	—	9	11.1	12.6	13	13.6	15.4	14.4	11.6	13.5	11.1
Morogoro	4.6	5.7	—	—	4.1	5.5	7.4	10.3	15.2	16.2	8.2	7.6	7.8
Mtwara	5.2	9.5	15.2	10.1	9.7	4.5	8	7	7.3	7.2	6.5	5.8	4.7
Mwanza	5.1	4	2.9	12.5	7.6	9.5	6.9	6.2	7.2	7.7	7.2	8.3	8.2
Rukwa	6.7	—	—	—	8	7.9	—	—	11.5	11	9.7	17.8	20.0
Ruvuma	6.2	7.3	2	3.3	8.1	7.7	7.4	9.8	9.5	10.3	10.3	9.9	7.3
Shinyanga	6.1	6.4	14.7	11.7	8.5	8.5	8	7.7	9	8	7.9	6.6	7.0
Singida	2.7	2.8	0	—	5.6	3.6	6.2	7.7	7.5	11.6	11.1	7.0	4.9
Tabora	2.8	4.4	2.5	6.2	3.2	6.1	5.9	6.8	6.8	7.3	6.2	7.6	5.8
Tanga	7.1	4.4	—	10.4	5.5	8	7.3	7.9	8.7	8.6	9.8	7.2	6.5
Total	5.3	5.9	6.9	7.8	6.8	7.6	8.5	8.7	9.2	10.4	9.1	8.2	7.2

Table 2.9: Prevalence of HIV infection among female blood donors by region, Tanzania 1992-2004

Region	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Arusha	2.2	3.9	-	15.6	4.4	6	7.6	25.2	15.1	20.4	10.2	18.1	17.1
Coast	5	10.2	11.8	9.2	-	8	13.1	15.8	25.1	21.2	17	11.9	10.0
Dodoma	4.8	-	-	0	-	9.2	6.2	6.7	5.3	8.7	7.8	7.8	6.1
DSM	7.7	-	-	6.7	-	40.6	32.1	55	14.9	31.4	18.9	14.8	17.4
Iringa	8.1	17.6	20	7.8	12.4	16.4	15.1	14.4	20.8	21.4	18.4	18.2	14.1
Kagera	11	8.6	8.3	14.3	7.4	11.3	14.3	19	19.5	20.5	15.9	19.2	16.6
Kigoma	4.1	5.8	5.1	0	6.1	2.6	2.6	6.6	3.6	5.1	3.4	6.5	4.1
Kilimanjaro	2.2	1.8	2.9	0	5.9	8.1	8.1	6.6	11.4	6.9	6.7	12.0	10.7
Lindi	2.3	1.9	-	1.6	3.6	4.9	5.2	4.3	5.8	6.7	7.1	8.3	5.3
Manyara												19.8	18.0
Mara	8.2	2.9	10	9.4	10.1	13.1	7.7	10.2	10.7	11.1	13.3	8.7	8.0
Mbeya	20.3	-	-	11.4	13.8	14.4	15.1	19.3	20.9	21	15.5	18.0	18.8
Morogoro	5.7	10.8	-	-	6	9.1	8.8	16	24.2	22.3	10.8	12.7	9.6
MtWARA	10.5	5.7	0	5.6	10.5	-	23	21.3	25.2	14.9	13.2	20.4	7.3
Mwanza	5.7	8	5	0	8.5	11.8	9.5	10.6	9.5	9.3	9.4	10.3	11.6
Rukwa	0	-	-	-	8.8	-	-	-	16	8.8	11.1	19.1	16.9
Ruvuma	6.4	6.7	2.1	6.1	10.5	12.7	12.2	11.8	12.7	14.1	13.1	11.6	10.8
Shinyanga	10	21.6	33.3	0	14.9	14.9	14.6	12.9	13.6	11.8	11.6	9.5	9.7
Singida	4.5	4.6	0	-	5.8	5.2	7	9.4	10.4	12.1	14.9	10.3	9.4
Tabora	2.7	5.8	0	12.9	3.2	7.7	9.5	8.8	9.3	8.9	7.9	11.8	10.7
Tanga	7	5.9	-	20.8	7	13.6	11.9	14	11.2	8.6	8	10.7	11.2
Total	5.9	6.2	4.8	9.4	8.2	11.6	11.8	12.6	13.3	13.7	12.3	11.9	10.7

The sex specific prevalence by region are shown in Tables 2.4 for males and 2.5 for females. The regions with the highest prevalence of HIV infection among males in descending order were Rukwa 20.0%, Kagera 18.5%, Iringa 11.8%, Arusha 11.7% and Mbeya 11.1%. All the mentioned regions showed a decrease in prevalence compared to the previous year except Arusha and Rukwa.

Prevalence among females was highest in Mbeya region at 18.8% followed by Dar es Salaam at 17.4%, Arusha at 17.1%, Rukwa 16.9% and Kagera at 16.6% in this descending order. The magnitude of infection rose in Dar es Salaam from 14.8% in 2003 to 17.4% in 2004. The rest of the mentioned regions had stable or decreasing prevalence.

HIV infection trends among the youths aged 15-24 years by region

As reiterated earlier, HIV infection among the youths is recently acquired and therefore prevalence estimates in this population approximates new infections. New infections or incident HIV infections closely reflect the true trend of the epidemic. To assess whether there have been any changes in the magnitude of infection among the youth by geographical distribution, data was analysed by ten year age groups for each region.

The five regions with the highest HIV infection prevalence in descending order were: Rukwa 19.0%, Kagera 15.7%, Arusha 13.8% Mbeya 10.0% and Morogoro/Mwanza both at 6.9%. Prevalence rose among the youth in all the mentioned regions except in Kagera and Morogoro.

When prevalence among ages group 15-24 years was grouped into five percent categories, the following was obtained:

- Ten regions namely, Coast, Dar es Salaam, Dodoma, Kigoma, Kilimanjaro, Lindi, Mara,

Mtwara, Singida and Tabora had prevalence between 0-5%.

- Eight regions namely Iringa, Manyara, Mbeya, Mwanza, Ruvuma, Shinyanga, and Tanga had a prevalence ranging between 5.1 to 10%.
- One region, Arusha, had prevalence ranging between 10.1-15%
- Two regions namely Kagera and Rukwa had prevalence ranging from 15.1 -20%.

For comparison with the previous years estimates, refer to Table 2.9 and Map 1.

Map 1: Regional Prevalence of HIV infection among blood donors aged 15-24 years, Tanzania 2003 and 2004

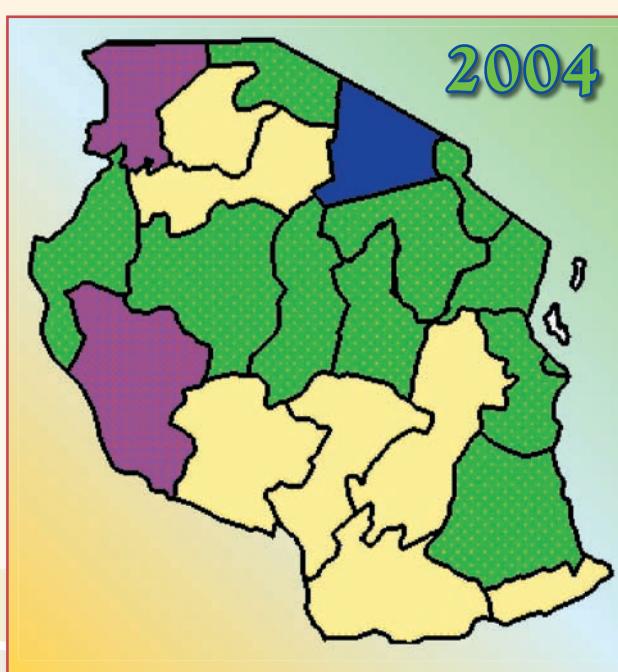


Table 2.9 Age specific HIV prevalence among blood donors by region, Tanzania 1999-2004

Region	Age Group	Year 1999		Year 2000		Year 2001		Year 2002		Year 2003		Year 2004	
		Total donors	% prev										
Arusha		3,030	22	7,223	13.8	6,827	17.8	—	—	2,095	11.1	2072	12.9
	15 - 24	853	20.5	1834	11.3	1659	15.2	215	13.0	490	9.2	528	13.8
	25 - 34	1288	23.8	3365	14.7	3178	18.3	990	8.7	1,047	12.1	1013	13.6
	35 +	889	20.7	2024	14.3	1990	19.2	500	8.0	558	10.9	531	10.7
Coast		3510	8.9	3160	12.5	3240	10.4	4470	9.6	4,688	7.0	3351	6.4
	15 - 24	941	7.8	606	8.2	829	7.2	1072	7.1	1,171	4.8	982	4.7
	25 - 34	1477	10	1305	13.1	1343	11.4	1964	10.8	2,044	6.7	1378	7.0
	35 +	1092	8.5	1249	13.9	1059	11.6	1434	9.8	1,473	9.2	991	7.3
Dar es Salaam		694	33.1	1739	8.6	1956	18.8	3547	12.0	4,923	10.0	4390	5.7
	15 - 24	129	29.5	264	6.4	472	14.8	919	7.3	1,374	8.4	832	4.3
	25 - 34	267	37.5	460	10.2	987	18.7	1676	12.9	2,226	11.1	1961	6.4
	35 +	298	31	1015	8.4	495	22.4	952	14.7	1,323	9.7	1597	5.6
Dodoma		2269	5.1	3001	3.9	8984	7.9	4351	7.6	3,933	7.0	2,572	7.9
	15 - 24	522	4	642	2	2026	6.6	833	7.7	926	7.3	715	4.5
	25 - 34	960	5.8	1275	4.3	3856	8.2	1882	8.2	1,616	7.2	1241	9.2
	35 +	787	4.8	1084	6.4	3083	8.4	1636	6.9	1,391	6.4	616	9.3
Iringa		4258	14.7	2393	14.6	5104	18.7	3450	14.8	2,115	15.4	2163	12.1
	15 - 24	1207	13.2	687	11.4	1324	15.9	976	12.6	551	12.2	709	7.1
	25 - 34	1809	17.1	1003	16.8	2170	21.3	1386	17.7	882	18.6	824	15.7
	35 +	1242	12.7	703	14.6	1608	17.4	1088	13.1	682	13.9	630	13.2
Kagera		4572	17.7	3827	19.5	5753	22	5965	18.0	4,699	20.7	6060	18.2
	15 - 24	1435	12.1	1045	15.1	1601	18.2	1724	15.1	1,261	19.4	1768	15.7
	25 - 34	1926	19.4	1694	21.2	2542	21.7	2513	18.5	2,082	20.5	2648	17.7
	35 +	1211	21.6	1088	21.1	1583	26.5	1728	20.2	1,356	22.1	1644	21.5
Kigoma		6860	6.4	6772	3.8	7412	4.9	3935	3.2	8,124	4.8	9049	3.1
	15 - 24	1537	4.8	1346	2.1	1811	3.9	942	2.7	1,876	3.3	2050	2.0
	25 - 34	2964	6.4	2959	4.3	3093	5.6	1601	3.2	3,509	5.4	3862	3.4
	35 +	2359	7.4	2467	4.3	2494	4.7	1392	3.5	2,739	5.0	3137	3.6
Kilimanjaro		5218	4.8	4435	6.8	4823	5.9	4125	6.8	3,334	4.8	3499	4.5
	15 - 24	1438	2.8	1189	3.8	1266	4.2	1084	4.4	883	2.9	969	3.7
	25 - 34	2374	5.2	1938	7.4	2103	6.1	1750	7.3	1,418	5.4	1500	4.5
	35 +	1406	6.3	1308	8.6	1448	6.8	1291	8.3	1,033	5.6	1030	5.3
Lindi		7083	3.4	5092	4.2	6046	3.8	5856	3.6	5,308	3.8	5645	3.6
	15 - 24	1905	3	1208	1.2	1484	2.1	1388	2.2	1,187	3.4	1308	3.0
	25 - 34	3110	3.2	2088	4.4	2657	3.8	2622	4.6	2,308	4.4	2455	4.3
	35 +	2068	4.3	1796	5.4	1841	4.3	1846	3.4	1,813	3.4	1882	3.2
Manyara			0		0			6093	17.9	4,780	12.0	4450	6.3
	15 -24		0		0			1634	15.4	1,349	9.8	1266	6.3
	25 - 34		0		0			2575	19.1	2,013	11.5	1851	6.8
	35 +		0		0			1887	18.5	1,418	14.9	1333	5.6

		Year 1999		Year 2000		Year 2001		Year 2002		Year 2003		Year 2004	
Region	Age Group	Total donors	% prev										
Mara	5151	9.2	10676	9.4	9277	9	10709	10.3	8,108	7.8	11732	5.9	
	15 – 24	1870	7.9	3274	6.6	2928	7.8	3497	8.2	2,694	5.9	4030	4.4
	25 – 34	2028	11.4	4261	10.8	4002	9.6	4440	11.1	3,390	8.6	4837	6.7
	35 +	1253	7.5	3141	10.3	2308	9.3	2772	11.7	2,024	9.1	2865	6.4
Mbeya	6691	15.2	7338	17	10618	16.4	7462	12.7	7,957	14.8	7144	13.3	
	15 – 24	1922	10.8	2102	12.2	3118	12.7	2117	9.4	2,568	8.5	1998	10.0
	25 – 34	2767	18.5	3051	20.1	4359	19	3054	15.3	3,028	18.0	3055	15.9
	35 +	2002	15	2185	17.3	3105	16.3	2291	12.4	2,361	17.4	2091	12.5
Morogoro	12389	11.3	7606	16.6	12755	17.2	9764	8.6	10,140	8.3	12387	8.0	
	15 – 24	2980	10.2	1676	16.6	2881	16.7	2206	8.9	2,386	8.5	2736	6.9
	25 – 34	5602	11.2	3430	16.2	5675	17.3	4270	8.7	4,556	8.2	5674	8.3
	35+	3807	12.4	2500	17	4068	16.9	3288	8.1	3,198	8.3	3977	8.4
MtWARA	3030	7.8	8665	8.2	5767	7.5	6476	6.8	4,833	6.5	3541	4.7	
	15 – 24	752	6.8	2084	7	1460	6	1583	5.5	1,090	5.5	854	3.3
	25 – 34	1409	8.4	3827	8.8	2589	7.4	3016	6.9	2,202	6.7	1667	5.2
	35 +	869	7.8	2754	8.2	1706	8.8	1877	7.8	1,541	6.9	1020	5.2
Mwanza	10273	7	9858	7.6	12515	8	16672	7.7	15,235	8.7	11,151	8.9	
	15 – 24	3081	5.6	2627	5.4	3783	5.6	4902	5.1	4,962	5.1	2933	6.9
	25 – 34	4190	8.3	4059	8.5	5068	9.3	6777	9.1	6,110	10.3	4756	9.8
	35 +	3102	6.8	3172	8.4	3643	8.8	4993	8.2	4,163	10.6	3462	9.4
Rukwa	3277	11.8	531	10.7	1829	9.8	1,749	17.9	3281	19.5	—	—	
	15 – 24	—	—	968	7.8	134	10.4	567	7.2	559	14.8	1029	19.0
	25 – 34	—	—	1321	14.5	215	9.8	776	11.3	726	19.3	1380	19.0
	35 +	988	12.3	182	12.1	486	10.5	464	19.4	872	20.0	—	—
Ruvuma	8301	9.8	9813	10.2	12187	11.2	14965	10.9	12,318	10.3	13127	8.1	
	15 – 24	2240	10	2688	8.4	3391	10.5	4232	8.1	3,569	8.0	3571	6.1
	25 – 34	3689	10.6	4277	10.8	5342	11.5	6755	12.3	5,385	11.5	5839	8.8
	35 +	2372	8.3	2848	11.1	3327	11.5	3978	11.5	3,364	10.6	3717	8.8
Shinyanga	8654	8.2	9332	9.4	12305	8.4	15603	8.3	19,748	7.0	19267	7.3	
	15 – 24	2167	6.6	2170	7.5	2759	6.4	3595	6.8	5,015	4.7	4586	5.5
	25 – 34	3987	8.6	4217	10	5950	9.1	7439	8.8	8,999	7.9	9169	8.0
	35 +	2500	8.7	2945	10	3568	8.8	4569	8.7	5,734	7.7	5512	7.7
Singida	4187	8.1	5326	8	6785	11.8	6209	11.9	4,962	7.6	5213	5.7	
	15 – 24	947	5.7	1195	7.7	1462	9.5	1394	10.6	1,027	4.4	1141	4.5
	25 – 34	1868	8.9	2266	8.4	3049	12.7	2691	13.9	2,074	8.4	2276	6.5
	35 +	1372	8.7	1865	7.9	2241	12.1	2124	10.1	1,861	8.5	1796	5.6
Tabora	11335	7.1	9084	7.2	9628	7.6	7973	6.6	9,052	8.4	12314	6.5	
	15 – 24	2877	5.3	2187	4.8	2464	6	1826	5.0	2,195	5.6	3058	4.9
	25 – 34	5121	7.6	4084	7.4	4369	8.3	3692	7.2	4,151	9.7	5596	6.9
	35 +	3337	7.9	2813	8.4	2795	8	2455	6.8	2,706	8.7	3660	7.1
Tanga	10967	8.3	9749	8.8	9583	7.2	6101	7.3	9,276	7.4	11637	5.9	
	15 – 24	2747	6.2	2383	8.7	2374	8.7	1,574	7.3	2,066	4.8	2575	5.1
	25 – 34	5122	8.6	4540	9	4436	9.5	2,836	10.5	4,481	8.2	5373	5.7
	35 +	3098	9.8	2826	8.5	2745	7.1	1,691	10.9	2,729	8.1	3689	6.7

3.0 NATIONAL HIV/AIDS ESTIMATES AND PROJECTIONS

Background

UNAIDS and WHO have developed a new procedure and computer software for making estimates and projections of HIV/AIDS magnitude and its impact. This endeavor provides a standardized approach to estimations that could be applied in all countries. The model consists of two computer software; the estimations and projections package (EPP) and the spectrum. The EPP software fits an epidemic curve on the ANC HIV surveillance data which have been collected over time to generate prevalence estimations both numerically and by curves. These prevalence estimations, together with various additional assumptions are then applied into the second software, the spectrum, to estimate and project impacts of the HIV/AIDS epidemic over time. In order for the model to work and generate plausible output, a number of inputs are required.

Recently, the World Health Organization (WHO), the Joint United Nation programme on HIV/AIDS (UNAIDS) and their partners released an update of Estimations and Projections Package, the EPP 2005.

Most of this chapter was initially published in the Surveillance Report Number 18. It is retained in this report to provide readers with estimates of important HIV/AIDS data that are not collected from the field and complemented by trends in HIV prevalence.

Methods

The HIV prevalence dataset from ANC clinics covering the period from 1985 to 2004 was used for estimating and projecting HIV infection burden using EPP 2005 software. The 2005 UN population estimates for adults aged 15 years and above was applied. This population was divided into urban and rural in the proportions of 77.4% for rural and 22.6% for urban areas basing on the 2002 national population census.

The HIV prevalence data of ANC attendees were entered into the EPP 2005 urban and rural pages. The ANC HIV prevalence was calibrated using an average of 5.3% for rural and 10.9% for urban HIV prevalence based on the results of the 2003/04 Tanzania HIV Indicator Survey (THIS). The HIV prevalence for rural areas was reduced by 20% to adjust for the inflating effect of semi-urban sites which are categorized as rural.

In February 2004, the impact indicators were produced in a three day HIV/AIDS estimations and projections consensus workshop involving technical partners and policy makers. The objectives of the workshop were to introduce EPP and Spectrum models, discuss and agree on model inputs and assess the available antenatal clinic (ANC) HIV surveillance data.

During the workshop, origin of estimation and projection package and spectrum models, rationale, inputs and the outputs were presented in a plenary followed by demonstration of necessary steps in the application of the models from inputting data to generating output.

Model inputs

The following data with sources in parenthesis were agreed set of spectrum input to generate impact estimates and projections. As much as possible data that is locally generated were preferred, otherwise UN estimates were used:

- ★ Base year population estimates (UN, 2002)
- ★ Age distribution of fertility (TRCHS, 1999)
- ★ Total fertility rate – 5.6 (TRCHS, 1999)
- ★ Sex ratio at birth – 96 (Census, 2002)
- ★ Life expectancy at birth: Male 46.8, Females 49.1 (UNDP, 1999)
- ★ Percent of women 15-19 never married – 72.8% (TRCHS, 1999)
- ★ Percent of women in monogamous union – 71% (TDHS, 1997)
- ★ Infant mortality rate – 107 (UN, 2002)
- ★ Crude death rate – 17 per 1,000 (UN, 2002)
- ★ Net International Migration is assumed to be zero.
- ★ HIV prevalence among ANC attendees (9.6%)
- ★ Start year of epidemic – 1983
- ★ Infants with AIDS dying in the first year (%) – 67 (UN, 2002)
- ★ Life expectancy after AIDS onset (years) – 1 (UN, 2002)
- ★ Percent reduction in fertility among HIV positive women – 50% (15-19 years), 20% (20-49 years) [UN, 2002]
- ★ Prenatal transmission (%) – 32 percent (UN, 2002)
- ★ HIV incubation period (%) – assumed slow pattern
- ★ Expenditure per AIDS patient – TZS 223,000 (ESRF, 2003)
- ★ Percent of AIDS patients hospitalized per year – 66 percent (ESRF, 2003)
- ★ Ministry of Health Budget – 243 billion in FY2002/03 (MoH, 2003) Tshs.
- ★ Number of hospital beds – 29,616 in 1998 (MoH, 1999)
- ★ Bed capacity factor – 80 percent (ESRF, 2003)
- ★ Bed days per AIDS patient – 40 days (ESRF, 2003); 25 days (NIMR, 2001)

Figure 3.1 shows estimates and projections of HIV prevalence for the whole country as well as for urban and rural sub-populations covering the period from 1980 to 2010. The urban curve shows an increasing HIV prevalence from 0% in 1981 to a peak of 12.61% in 1992 and subsequently leveled to a plateau between 10.9% and 11.8% during the years from 2003 to 2010. The rural curve shows a steeply increasing HIV prevalence trend until 1995 when it reached its peak at 7.0% that was subsequently followed by a gradual decline to reach 5.2% in 2004, and then stabilizing at between 5.1% and 5.3% from 2005 to 2010.

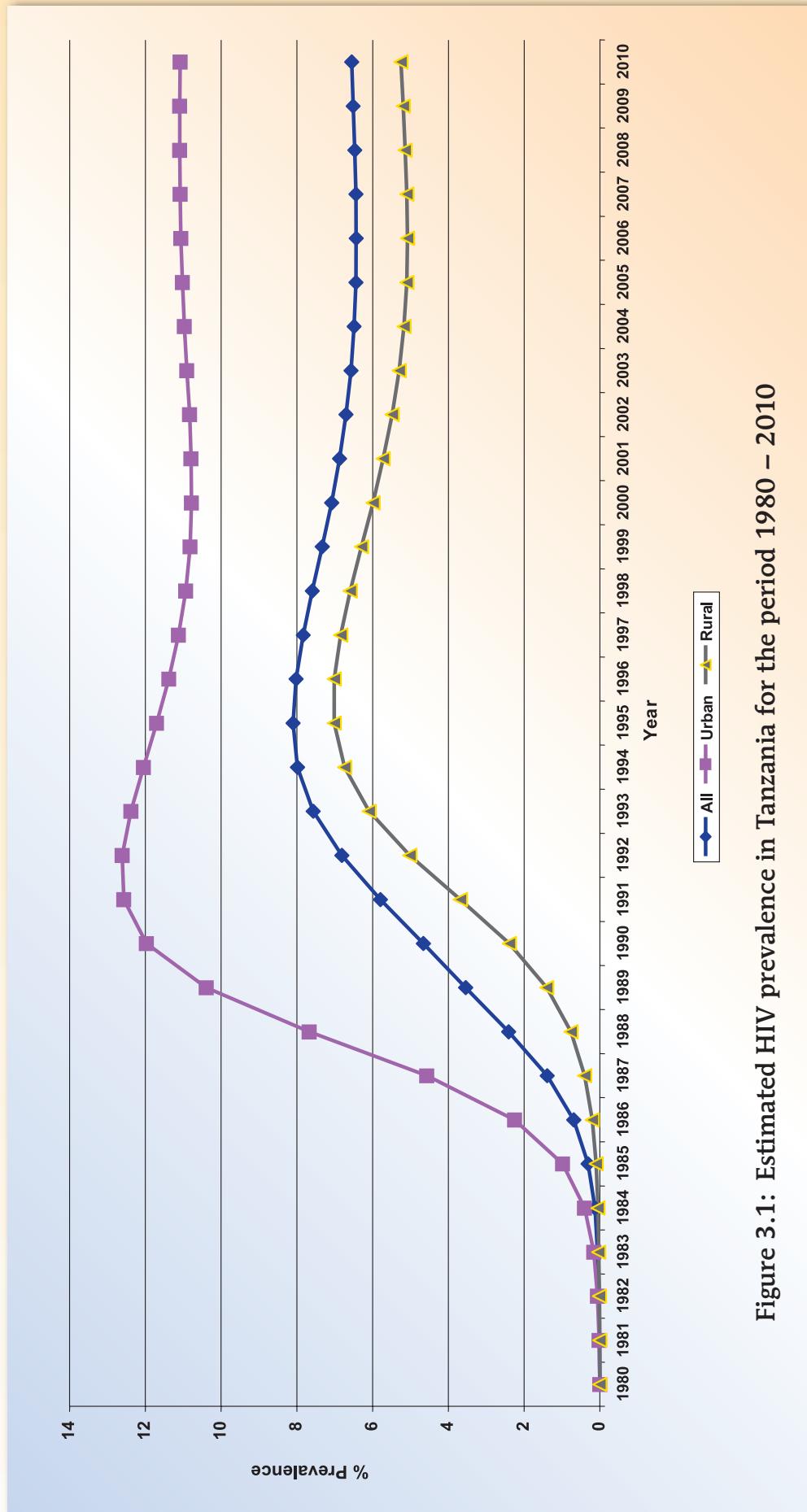


Figure 3.1: Estimated HIV prevalence in Tanzania for the period 1980 – 2010

The rural curve shows a steeply increasing HIV prevalence trend until 1995 when it reached its peak at 7.0% that was subsequently followed by a gradual decline to reach 5.2% in 2004, and then stabilizing at between 5.1% and 5.3% from 2005 to 2010. Fig 2.8 shows the estimates and projections of new HIV infections from 1980 to 2010. According to this figure, new infections rose to peak of 250,000 infections per year in 1995, before declining to 140,000 in 1997, and then steadily rising again to 225,000 new infections in 2010. Between 1983 and 1990 the number of new infections in urban areas was higher than that of rural areas. Since 1991 more new infections are encountered in rural areas, and according to estimates and projections, the absolute number of new HIV infections in rural areas will remain higher and reach twice that of urban areas in 2010 i.e. 150, 000 versus 70,000. Table 3.1 shows the actual numbers, for figures 3.1 and 3.2.

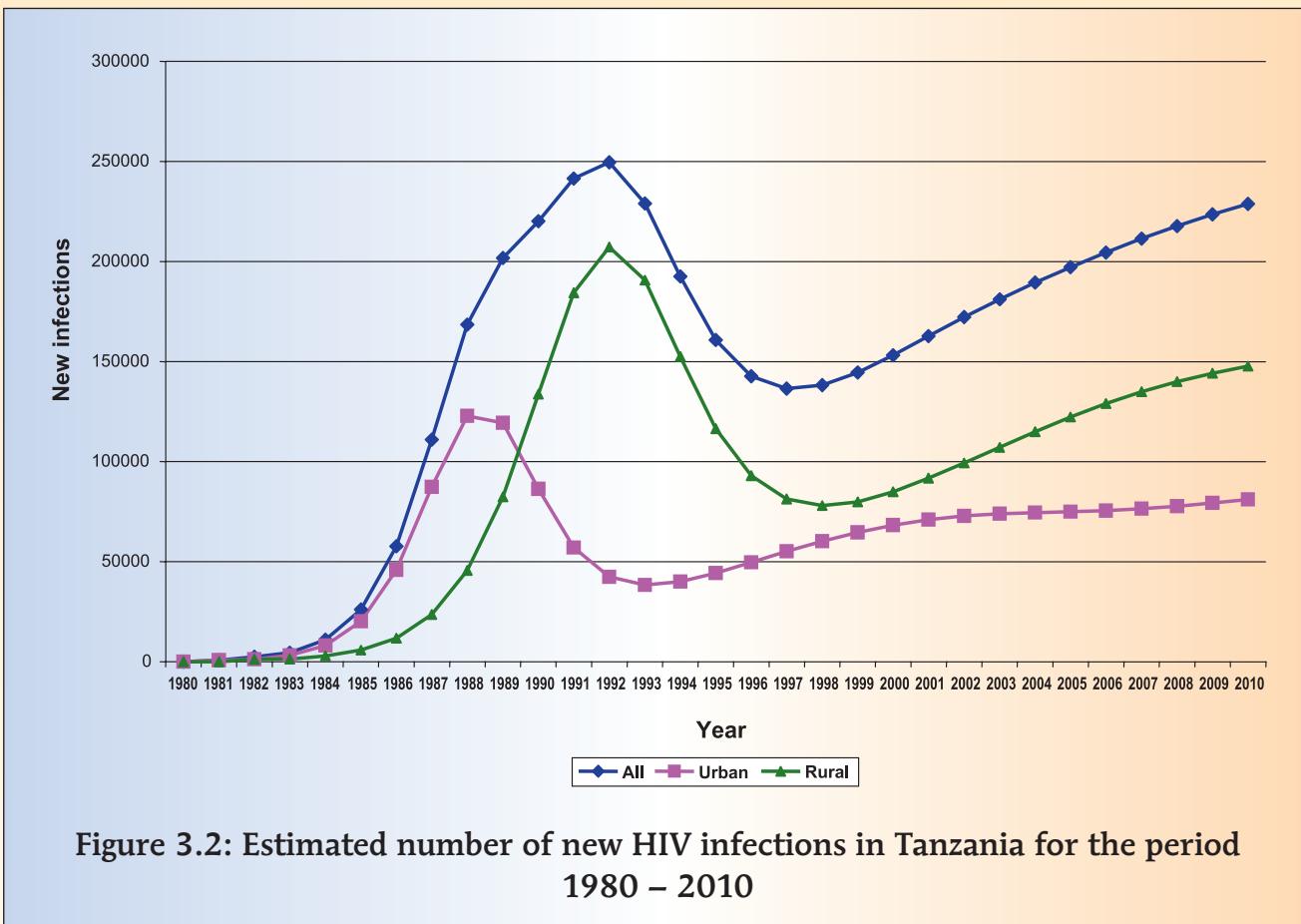


Figure 3.2: Estimated number of new HIV infections in Tanzania for the period 1980 – 2010

Table 3.1 Estimated burden of HIV infection for the period 1980 - 2010**NATIONAL ESTIMATES****Pop in base year: 23,834,140****BASE YEAR 2005**

Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
% HIV+	0	0.01	0.02	0.06	0.13	0.31	0.69	1.39	2.41	3.54	4.66
Number HIV+	725	3,154	7,612	18,386	43,884	100,395	208,507	370,880	561,041	761,282	
New HIV infections	0	727	2,447	4,526	10,970	26,002	57,744	110,969	168,466	201,794	220,143
Population	12,247,679	12,598,504	12,961,497	13,337,502	13,726,594	14,128,250	14,542,646	14,970,534	15,411,221	15,863,212	16,324,387

Urban (Population in base year 5,386,516)

% HIV+	0	0.02	0.06	0.16	0.40	0.98	2.25	4.57	7.67	10.39	11.97
Number HIV+	725	1,932	5,059	13,085	32,939	77,971	163,164	281,392	391,929	463,829	
New HIV infections	727	1,221	3,173	8,160	20,210	45,940	87,365	122,909	119,344	86,353	
Population	2,919,448	3,003,074	3,089,596	3,179,210	3,271,915	3,367,539	3,465,998	3,567,162	3,670,211	3,773,752	3,876,167

Rural (Population in base year 18,447,624)

% HIV+	0	0	0.01	0.03	0.05	0.10	0.20	0.40	0.76	1.40	2.39
Number HIV+			2,553	5,301	10,945	22,425	45,342	89,488	169,112	297,453	
New HIV infections			1,226	1,353	2,810	5,792	11,804	23,604	45,557	82,449	133,790
Population	9,328,231	9,595,430	9,871,900	10,158,292	10,454,679	10,760,711	11,076,648	11,403,373	11,741,010	12,089,460	12,448,220

Table 3.1 Continues: Estimated burden of HIV infection in Tanzania for the period 1980 - 2010

Year	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
% HIV+	5.79	6.81	7.57	7.98	8.10	8.02	7.83	7.59	7.33	7.08
Number HIV+	971,551	1,175,655	1,342,199	1,453,472	1,513,739	1,537,204	1,525,884	1,509,595	1,494,600	
New HIV infections	241,434	249,588	229,011	192,492	160,806	142,632	136,445	138,196	144,506	153,172
Population	16,792,314	17,264,471	17,738,540	18,212,944	18,687,334	19,161,907	19,636,268	20,113,814	20,598,519	21,095,935
Urban (Pop in base year 5,386,516)										
% HIV+	12.57	12.61	12.38	12.05	11.70	11.38	11.12	10.93	10.82	10.78
Number HIV+	499,679	513,510	515,929	513,132	508,778	505,200	503,843	505,605	510,923	519,809
New HIV infections	57,061	42,387	38,339	39,966	44,289	49,684	55,151	60,203	64,591	68,211
Population	3,976,161	4,073,075	4,166,949	4,258,447	4,348,724	4,439,041	4,530,316	4,624,056	4,721,485	4,823,711
Rural (Pop in base year 18,447,624)										
% HIV+	3.68	5.02	6.09	6.74	7.01	7.01	6.84	6.59	6.29	5.99
Number HIV+	471,872	662,145	826,269	940,340	1,004,961	1,032,005	1,033,854	1,020,279	998,672	974,791
New HIV infections	184,373	207,202	190,671	152,526	116,517	92,948	81,294	77,993	79,915	84,961
Population	12,816,154	13,191,395	13,571,590	13,954,497	14,338,609	14,722,866	15,105,951	15,489,758	15,877,035	16,272,223

Table 3.1 Continues: Estimated burden of HIV infection in Tanzania for the period 1980 - 2010

Year	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
% HIV+	6.87	6.70	6.57	6.49	6.44	6.43	6.44	6.47	6.51	6.55
Number HIV+	1,484,954	1,483,244	1,490,870	1,508,278	1,535,223	1,570,879	1,613,886	1,662,514	1,714,917	1,769,379
New HIV infections	162,706	172,174	181,125	189,430	197,195	204,522	211,381	217,704	223,486	228,803
Population	21,607,900	22,136,761	22,683,706	23,249,373	23,834,140	24,437,684	25,059,187	25,698,128	26,354,491	27,028,401

Urban (Population in base year 5,386,516)

% HIV+	10.79	10.83	10.90	10.97	11.02	11.06	11.08	11.09	11.09	11.08
Number HIV+	531,820	546,148	561,805	577,865	593,707	609,053	623,855	638,183	652,185	666,053
New HIV infections	70,968	72,844	73,942	74,507	74,925	75,528	76,462	77,734	79,297	81,089
Population	4,930,453	5,041,004	5,154,177	5,269,271	5,386,516	5,506,401	5,629,136	5,754,679	5,882,912	6,013,753

Rural (Population in base year 18,447,624)

% HIV+	5.72	5.48	5.30	5.17	5.10	5.08	5.10	5.14	5.19	5.25
Number HIV+	953,134	937,096	929,065	930,413	941,516	961,825	990,032	1,024,331	1,062,732	1,103,326
New HIV infections	91,738	99,330	107,182	114,922	122,270	128,994	134,919	139,970	144,189	147,714
Population	16,677,446	17,095,758	17,529,528	17,980,101	18,447,624	18,931,283	19,430,052	19,943,449	20,471,579	21,014,649

Table 3.2 HIV/AIDS estimates

Year	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
New AIDS cases											
Total	142,990	156,420	167,510	175,880	181,710	185,290	187,220	187,940	188,140	188,400	189,160
Males	70,640	75,900	80,170	83,390	85,800	87,480	88,730	89,650	90,450	91,270	92,240
Females	72,360	80,530	87,340	92,490	95,910	97,810	98,490	98,290	97,690	97,130	96,930
Annual HIV+ births											
Total	46,430	46,510	46,280	45,720	44,960	44,320	43,900	43,540	43,310	43,290	43,350
Percent	3.56	3.52	3.47	3.41	3.35	3.29	3.25	3.22	3.19	3.17	3.17
Annual AIDS deaths											
Total	128,480	143,830	157,250	168,210	176,350	181,950	185,280	186,900	187,350	187,350	187,470
Males	64,780	71,010	76,260	80,470	83,570	85,870	87,420	88,510	89,300	90,000	90,750
Females	63,700	72,820	80,980	87,740	92,780	96,080	97,860	98,380	98,040	97,350	96,720
Per thousand	4.23	4.63	4.94	5.17	5.3	5.36	5.35	5.29	5.2	5.1	5.01
Cumulative AIDS deaths (thousands)											
Total	610	750	910	1,080	1,260	1,440	1,620	1,810	2,000	2,190	2,370
Males	330	400	470	560	640	720	810	900	990	1,080	1,170
Females	280	360	440	520	620	710	810	910	1,010	1,110	1,200
Adult HIV incidence (%)											
	1.5	1.45	1.43	1.44	1.45	1.47	1.48	1.49	1.5	1.5	1.49
Annual new TB cases	100,430	102,530	104,240	105,750	107,260	108,900	110,760	112,910	115,350	118,100	121,110

**Table 3.3: Estimated male (thousands) living with HIV/AIDS by age groups,
Tanzania 2000 – 2006**

Year	2000	2001	2002	2003	2004	2005	2006
0 – 4	50	50	50	50	50	50	50
5 – 9	30	30	30	30	30	30	30
10 – 14	0	0	0	0	0	0	0
15 – 19	40	40	40	40	40	40	40
20 – 24	80	80	80	80	80	80	90
25 – 29	160	160	160	170	170	170	180
30 – 34	160	160	160	170	170	180	180
35 – 39	120	120	130	130	130	130	140
40 – 44	80	80	80	80	90	90	90
45 – 49	50	50	50	50	50	50	50
50 – 54	30	30	30	30	30	30	30
55 – 59	10	10	10	10	10	10	10
60 – 64	0	0	0	0	0	0	0
65 – 69	0	0	0	0	0	0	0
70 – 74	0	0	0	0	0	0	0
75 – 79	0	0	0	0	0	0	0
80 +	0	0	0	0	0	0	0
Total	810	820	830	840	860	880	900

**Table 3.4 Estimated female (thousands) living with HIV/AIDS by age groups,
Tanzania 2000 – 2006**

Year	2000	2001	2002	2003	2004	2005	2006
0 – 4	50	50	50	50	50	50	50
5 – 9	30	30	30	30	30	30	30
10 – 14	0	0	0	0	0	0	0
15 – 19	100	100	100	100	100	110	110
20 – 24	210	210	210	210	220	230	230
25 – 29	200	200	200	200	200	210	210
30 – 34	130	130	140	140	140	150	150
35 – 39	90	90	90	90	90	100	100
40 – 44	60	60	60	60	60	60	70
45 – 49	40	40	40	40	40	40	40
50 – 54	20	20	20	20	20	20	20
55 – 59	10	10	10	10	10	10	10
60 – 64	0	0	0	0	0	0	0
65 – 69	0	0	0	0	0	0	0
70 – 74	0	0	0	0	0	0	0
75 – 79	0	0	0	0	0	0	0
80 +	0	0	0	0	0	0	0
Total	940	950	950	960	980	1000	1020

Table 3.5: Estimated cause and type specific orphans in Tanzania, 1985 – 2006.

<i>Year</i>	<i>Maternal AIDS</i>	<i>Paternal AIDS</i>	<i>Dual AIDS</i>	<i>All AIDS</i>	<i>Total Orphans (all causes) (thousands)</i>
1996	255,500	282,780	265,770	272,520	1,480
1997	320,710	338,770	328,100	331,380	1,560
1998	389,020	394,750	392,560	391,210	1,640
1999	457,260	448,680	455,940	450,000	1,720
2000	522,200	498,660	514,660	506,200	1,800
2001	580,880	543,320	565,890	558,310	1,870
2002	631,050	581,620	607,850	604,820	1,940
2003	671,400	613,150	639,590	644,950	1,990
2004	701,640	637,980	661,210	678,410	2,040
2005	722,390	656,550	673,740	705,190	2,080
2006	734,840	669,460	678,860	725,450	2,110

4.0 SURVEILLANCE OF OTHER STIs

Introduction

Sexually transmitted infections (STIs) are a major public health problem, which cause acute illness, infertility, long-term disability and death, with severe social, economic, psychological and health consequences for millions of people. STIs are a marker of sexual networking and may provide clues on the extent of unprotected sex in a community. STIs are also known to facilitate sexual transmission and spread of HIV infection. While control of STIs has been recognized as one of the key strategies in the control and prevention of HIV infection, effective STI management is also an important cornerstone of STI control. The latter prevents the development of complications, decreases the spread of these infections in the community and provides opportunity for provision of health education about HIV prevention. Consequently, systematic surveillance for STIs through a national programme may provide the needed environment for their eventual control.

History of STI control

STI control in Tanzania started as a pilot in 22 urban-based facilities in a few districts during late 1980s, followed by 12 regions under the support of the European Union (EU). The EU supported regions included Arusha, Dar es Salaam, Dodoma, Iringa, Kigoma, Lindi, Mara, Mbeya, Morogoro, Mwanza, Shinyanga and Tanga. Subsequently, the programme was expanded to more regions and by the end of 2004, all regions of the country had been covered by the programme. Despite these developments, irregular supply of STI drugs, lack of laboratory reagents and short supply of other medical supplies have hampered the control of STIs in many clinics. Also there is inadequate work force of well-trained personnel to provide STI services. Since heterosexual HIV transmission is closely related to that of other STIs, management and control of the latter in the community can greatly reduce the rate of HIV infections. Consequently, it is important for programme managers to know whether or not these other STIs are well managed or controlled to enable them to assess the impact of their STI management and control activities on HIV transmission.

The aim of monitoring is therefore to keep track of the various STI management and control activities and assess progress towards control of HIV/AIDS/STIs. The following section deals with methods used in the monitoring of the other STIs nationally.

Methods

Sites for STI surveillance include hospitals, health centres and dispensaries that provide comprehensive STI care in Tanzania. Methods of surveillance have involved the development of a special data collection form that is distributed to surveillance sites to collect the needed information. The forms are used to collect aggregate information, which includes, number of new episodes of STI syndromes, number of treated cases by type and location of facility, type of STI by gender and by age group (<20, 20-29 and 30+years). The data collection form also records information about re-treatment and number of contacts traced. This aggregated information is recorded by age-groups, which limits further analysis at a national level. The aggregated information is reported at quarterly intervals by submitting the duly-filled forms to NACP through the respective District and Regional Medical Officers for data processing and compilation of a report at the end of each year. On receiving the forms, computer data

entry clerks routinely process the data using the EPIINFO and dBase IV software before they are finally converted to the STATA Version 8 software for analysis to produce the required tables and figures.

Results

During the year 2004, a total of 208,384 STI episodes were reported by STI clinics of the different health facilities throughout the country. Of these episodes, 94,366 (45.3%) were reported as genital discharge syndromes, 40,408 (19.4%) were reported as genital ulcer diseases, 49,605 (23.8%) were reported as pelvic inflammatory diseases, and the rest 24,005 (11.5%) were reported as other syndromes (Table 4.1).

The number of reported syphilis cases was higher among females than in males. Reported number of female cases in the age group 20-29 years was more than four times that among males (See Figure 4.1). Overall, regions reporting the highest number of episodes include, Dar es Salaam (23,955), Mwanza (23,215), Mbeya (21,521), Shinyanga (20,172) and Tanga (18,084) in decreasing order. The smallest number of episodes was reported from Lindi (1,130), Kagera (1,726), Singida (2,186) and Tabora (2,943) (See Table 4.1). The highest number of STI syndromes was reported in the age group 20-29 years among females, followed by the age group 30 years and above among males. Figures 4.3-4.6 summarize the pattern of age and sex distribution of STI syndromes.

Among the cases, which reported STI episodes, 27,957 (13.4%) underwent re-treatment, possibly due to drug resistance, re-infection, non-compliance and treatment interruption for various reasons. Assuming that each case had one contact, altogether about 26.1% of the contacts (54,485 cases) were traced and treated. This proportion is slightly lower than that in 2003 and possibly reflects a low yield. This low yield emphasizes the need for strengthening of contact tracing strategies in the country.

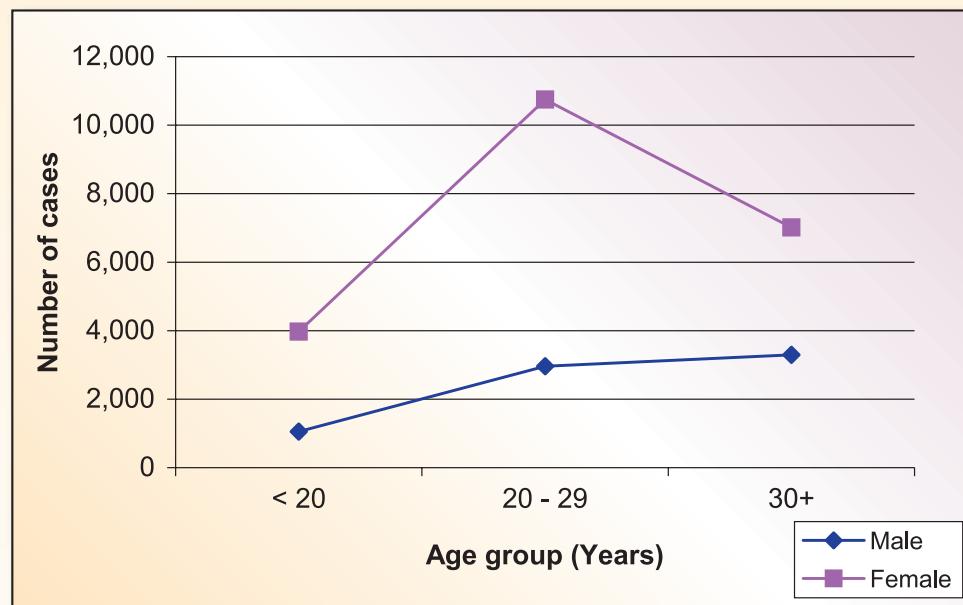


Figure 4.1: Total reported syphilis cases by age and sex, Tanzania Jan-December 2004

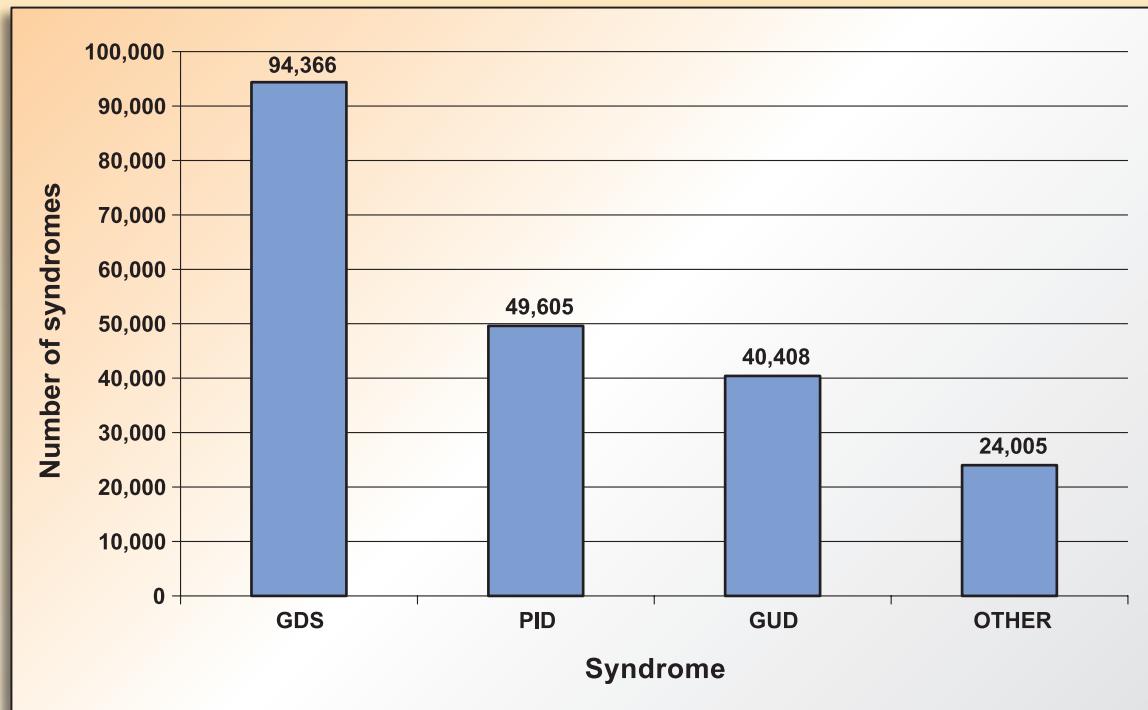


Figure 4.2 Number of reported New STI syndromes, Tanzania, 2004

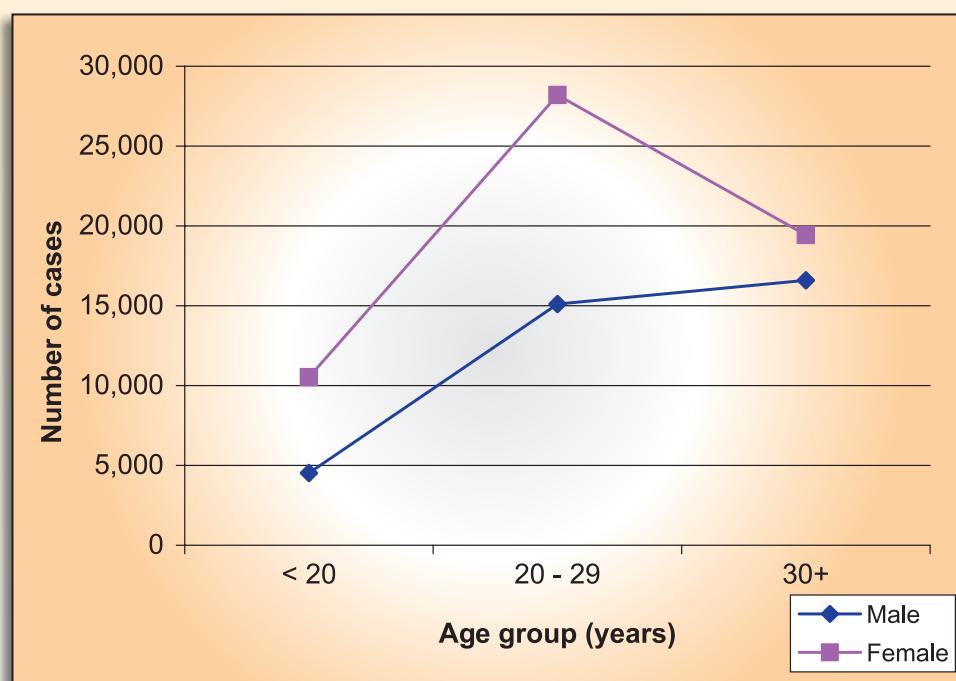


Figure 4.3 Distribution of New Genital Discharge Syndromes by age and sex, Tanzania, 2004

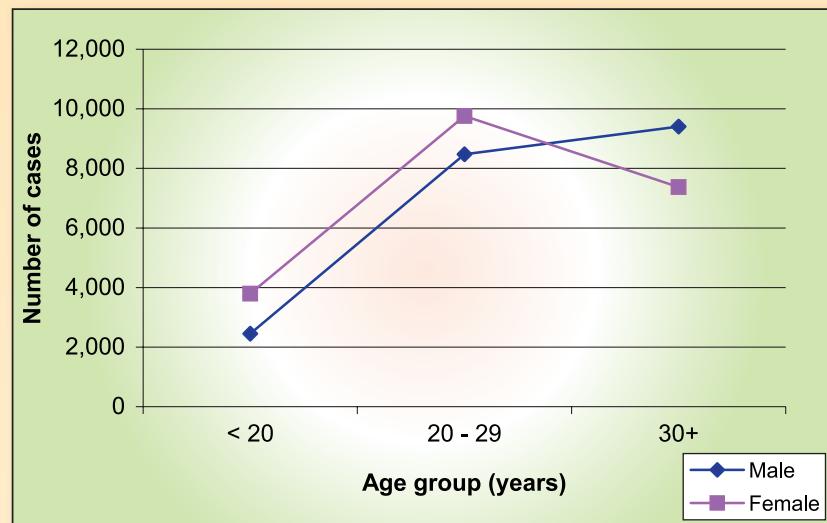


Figure 4.4 Distribution of New Genital Ulcer Disease by age and sex, Tanzania, 2004

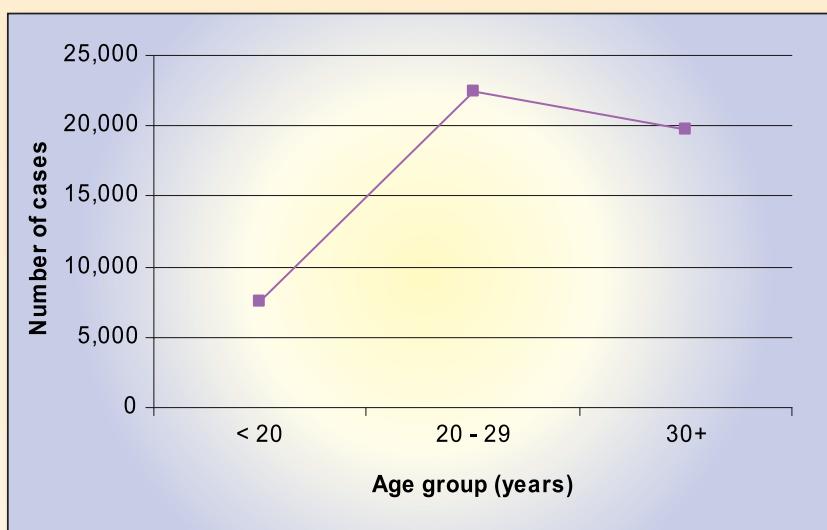


Figure 4.5 Distribution of New PID cases by age, Tanzania, 2004

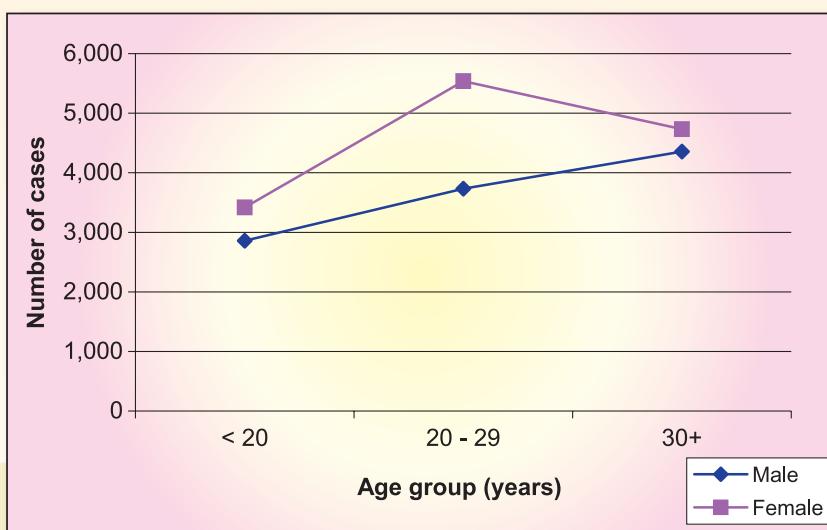


Figure 4.6 Distribution of new Other STI cases by age and sex, Tanzania, 2004

Table 4.1 Distribution of new syndromes, re-treatments and contacts by sex and regions, Tanzania, Jan-Dec 2004

Region	Sex	GDS	GUD	PID	Others	Total	Re-Treated	Contacts
ARUSHA	Male	434	294		266	994	152	781
	Female	976	406	746	321	2449	274	1052
COAST	Male	1308	710		556	2574	311	717
	Female	2107	805	2248	73	5233	451	692
DODOMA	Male	2873	1103		654	4630	692	2031
	Female	3761	1385	3017	1046	9209	877	2953
DSM	Male	3995	2733		1876	8604	2453	1352
	Female	6566	2233	4516	2036	15351	3246	1256
IRINGA	Male	604	351		280	1235	134	266
	Female	1138	456	657	374	2625	173	309
KAGERA	Male	276	114		189	579	99	193
	Female	331	147	498	171	1147	132	302
KIGOMA	Male	1487	594		392	2473	370	1240
	Female	3067	683	1740	585	6075	693	1120
KILIMANJARO	Male	324	80		105	509	81	553
	Female	1419	107	894	966	3386	190	169
LINDI	Male	250	166		35	451	26	65
	Female	224	151	267	37	679	41	90
MANYARA	Male	2452	303		365	3120	234	754
	Female	3487	299	2257	676	6719	368	517
MARA	Male	592	293		109	994	158	556
	Female	1148	312	897	152	2509	257	488
MBEYA	Male	3648	3523		1099	8270	1148	2638
	Female	4768	3254	3998	1231	13251	1394	2975
MOROGORO	Male	1181	585		383	2149	320	1283
	Female	1754	613	2110	407	4884	449	909
MTWARA	Male	2479	1450		879	4808	1550	2045
	Female	3603	1422	3731	807	9563	2787	2199
MWANZA	Male	3273	2370		912	6555	839	4264
	Female	6444	2353	6486	1377	16660	1699	2642
RUKWA	Male	1304	1054		882	3240	534	1891
	Female	1858	1229	1946	997	6030	757	2565
RUVUMA	Male	1440	819		330	2589	230	1510
	Female	2489	1086	1640	240	5455	278	1191
SHINYANGA	Male	3768	2045		466	6279	881	3472
	Female	5907	2078	5406	502	13893	1278	2253
SINGIDA	Male	391	164		45	600	50	233
	Female	557	212	757	60	1586	107	317
TABORA	Male	440	515		219	1174	156	207
	Female	649	286	581	253	1769	217	312
TANGA	Male	3698	215		905	4818	714	2282
	Female	5896	1410	5213	747	13266	1157	1841
TOTAL		94,366	40,408	49,605	24,005	208,384	27,957	54,485

5.0 VOLUNTARY COUNSELING AND HIV TESTING SERVICES

Introduction

In 1995 the Ministry of Health, initiated an improved VCT pilot programme in four regions (Dar es Salaam, Morogoro, Coast and Dodoma). Gradually the programme expanded to provide comprehensive VCT services to the general public and by 1997, a total of 59 sites had been established in 19 regions. In 2004 there were 480 sites that are managed by public and faith-based organizations and 41 sites that are managed by African Medical Research Foundation (AMREF). In addition to those, there are a significant number of sites which are managed by non-governmental organizations (NGOs), faith based organizations (FBOs) and private health facilities in the 21 regions of Tanzania mainland.

Majority of VCT services are provided in established sites that are run by trained counselors. The Ministry of Health (MOH) trains its counselors using the National VCT training guidelines and curricula, which are also distributed to other institutions for training their counselors. The recommended period for training of counselors is six continuous weeks and the training is usually conducted by a special national team of trainers of counselors. There are two types of counseling sites. Those located and managed by public health facilities (located within hospitals, health centers and dispensaries which may be government, faith based or private) and those managed by NGOs or private institutions as stand alone sites. Health facility-based sites are largely accessed by referred suspected HIV infected patients, while the stand alone sites are accessed largely by apparently healthy members of the general public who are curious about their sero-status for various reasons including pre-marital testing, testing as a requirement for traveling abroad for studies, etc. Government health facility-based sites provide free services while the stand alone sites provide services at nominal fees.

Methods of monitoring

Specially designed VCT data collection forms are distributed to all sites that provide VCT services to collect quarterly aggregated information which includes number of new clients counseled, number of clients tested for HIV and number of HIV positives. Fully-filled forms are sent to NACP for compilation. New VCT clients are defined as those who attended VCT sites for the first time and received pre-counseling services regardless of or not consent for HIV testing. Tested clients are defined as those who consent for and undergo HIV testing, including new clients as well as those who come back for a repeat HIV test three months after an initial negative test results. Percent positive is the proportion of clients whose initial HIV test results are positive.

Results

A total of 190,737 new clients accessed VCT services in Tanzania mainland during the year 2004. Of the new clients 100,342 (53%) were reported by counselors from the 21 regions while 90,395 were reported by AMREF from ANGAZA sites. Overall, 213,748 clients were tested for HIV, 122,854 (57.3%) and 91,164 (42.7%) from the sites in the regions and in ANGAZA sites respectively.

The overall HIV prevalence among users of health facility-based VCT sites was 39.3%, ranging from 6.9% in Manyara to 51.4% in Tabora region. On the other hand HIV prevalence among clients tested in ANGAZA sites was 10.6%, implying that ANGAZA sites are largely stand alone and are accessed by clients from the general public who are interested with knowing their HIV status for reasons other than being suspects of HIV infection.

Data collected through the monitoring tool are available since 1997. Results of analysis of these

data show that in 1999 the proportion of HIV positive clients was 76.0%. This dropped slightly to 59.5% in 2000, and significantly to 18.9% in 2002. The observed declining trend is probably due to increase in the number of stand-alone VCT sites relative to that of health facility-based sites. During 2004, there was a slight increase in the proportion of HIV positive among HIV tested VCT clients. This latter observation may be a result of introduction of ARV in 2004 by the government which may have motivated HIV infected individuals to seek VCT services as a way of accessing ARV.

The proportion of new VCT clients in each region increased parallel to the increase in the number of VCT sites and community sensitization on the importance of using VCT services. Table 5.1 shows number of new VCT clients, those tested for HIV and proportion of HIV positives among HIV tested clients by regions for the five-year period from 2000 to 2004. Figure 5.2 shows an increasing trend in both number of clients who were new and those tested for HIV for the same period. In 2004, the increase was quite remarkable compared to the previous years. This increase may be due to various reasons including improved access to VCT services and introduction of ARV services in the country.

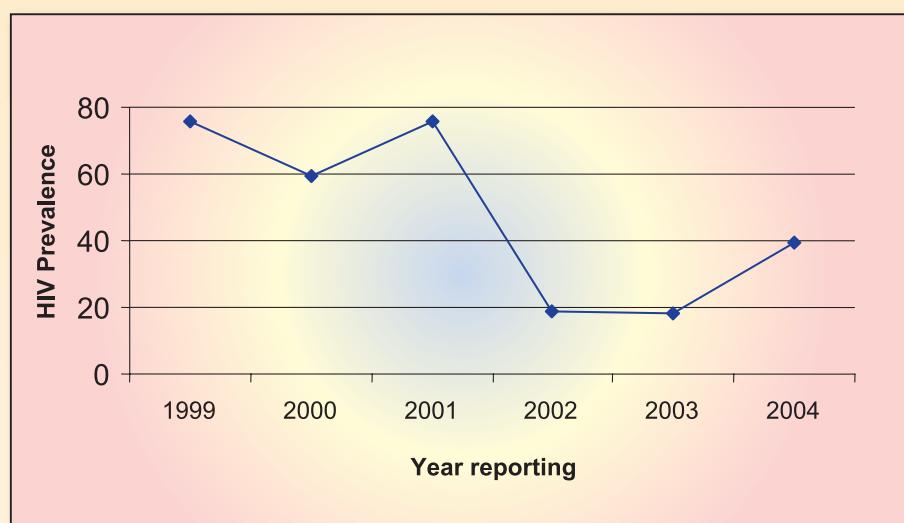


Fig 5.1 Trend in HIV prevalence among VCT tested clients, Tanzania, 1997 – 2004

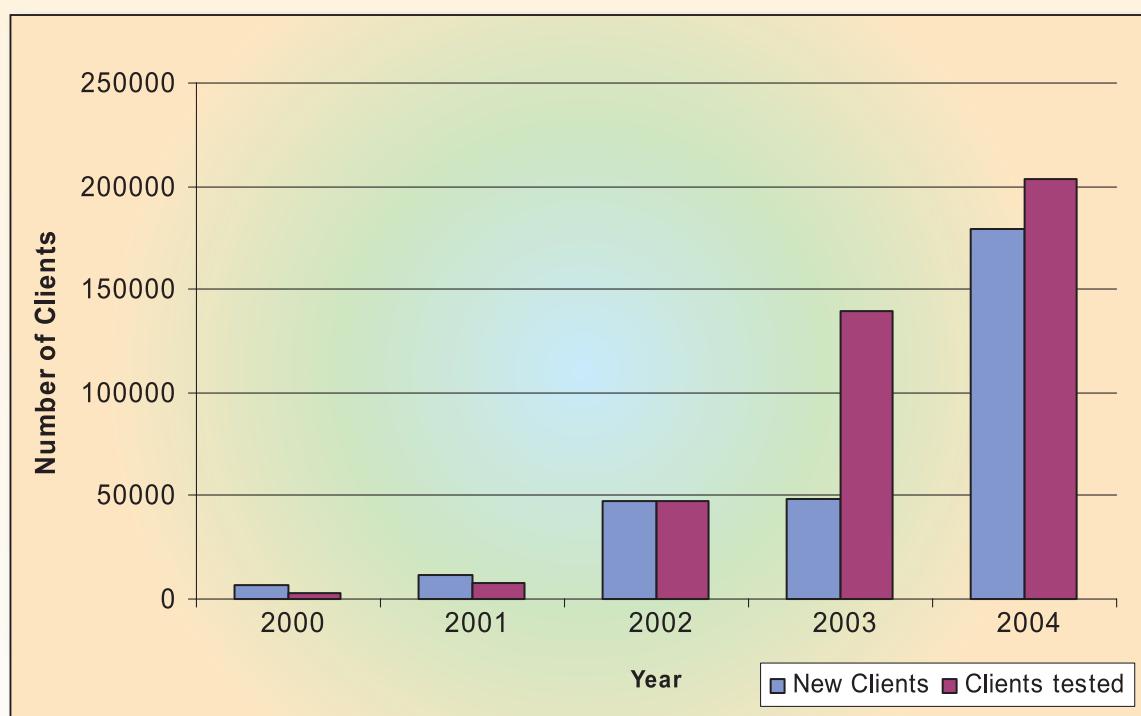


Fig 5.2 Number of new clients and clients tested for HIV at VCT sites, Tanzania 2000 – 2004

Table 5.1 Voluntary Counseling and HIV Testing Services by region, Tanzania 1999 – 2004

Region	2000				2001				2002				2003				2004			
	New clients	client tested	HIV positive %	New clients	clients tested	% +Ve	New clients	clients tested	% +Ve	New clients	clients tested	% +Ve	New clients	clients tested	% +Ve	New clients	clients tested	% +Ve		
Anusha	34	20	30	717	272	51	1118	1031	42.8	1775	1,843	37.3	1,950	1,797	25.8					
Coast	317	40	80	821	416	81	204	108	47.2	609	556	27.3	875	580	32.1					
Dodoma	—	—	—	310	91	71	—	—	—	3699	3,716	21.1	1908	3,876	24.1					
Dar es Salaam	3042	1799	58.8	3240	2989	89	33460	33696	11.7	11340	17,007	34.9	26484	46,855	58.8					
Iringa	857	412	61.9	1010	617	73	1635	1635	50.5	6501	6,894	32.8	6825	6,679	17.7					
Kagera	—	—	—	516	260	61	1058	731	36.1	594	617	33.2	2460	2460	29.4					
Kigoma	227	170	59.4	468	332	62	781	737	23.6	2680	2,767	19.7	5924	5,936	10.5					
Kilimanjaro	—	—	—	461	301	64.4	916	666	22.3	1096	5,714	7.8	9753	9,595	19.8					
Lindi	153	71	56.3	301	214	54.9	542	646	48.7	481	485	38.1	5149	5,214	26.4					
Manyara	—	—	—	—	—	—	—	—	—	1168	1,552	9	2738	2,893	6.9					
Mara	478	310	53.9	724	432	57.6	—	—	—	2205	2,198	32.1	5564	5,506	21.2					
Mbeya	—	—	—	—	—	—	2637	2649	42	0	23,500	16.3	4342	4,102	30.9					
Morogoro	85	11	72.7	291	136	73	142	177	35.5	1041	1,076	25.5	2051	2,224	42.8					
Mtwara	152	—	—	192	91	81	524	329	32.8	2614	2,679	9	597	595	35.3					
Mwanza	788	412	62.1	928	592	73	1688	1689	36.4	1478	1,523	32.6	8968	8968	11.0					
Rukwa	92	32	59.4	103	74	63	402	352	28.6	846	911	28.9	518	518	20.0					
Ruvuma	76	17	88.2	132	101	89	2042	2709	22.5	2947	3,021	25.7	5,546	5,675	20.6					
Singida	—	—	—	344	179	74	304	479	22.7	2677	2,691	12.7	253	228	31.1					
Shinyanga	155	—	—	381	156	68	130	247	40.4	2279	1,816	24.9	2,186	2,172	24.2					
Tanga	83	44	70.5	159	71	72	69	71	70.4	965	954	31.7	5598	5,467	27.0					
Tabora	—	—	—	403	149	56	—	—	—	1022	1,685	34.5	653	1,514	51.4					
Total	6539	3338	59.5	11501	7473	76	47656	47956	18.9	48017	83,205	23.6	100,342	122,584	39.3					
ANGAZA													56,767	10.7	90,395	91,164	10.6			

HIV prevalence among first time clients in ANGAZA sites

Table 5.2 below shows distribution of VCT clients who attended ANGAZA sites and their HIV sero-status by sex during the year 2004. A total of 90,395 clients were tested for HIV, of these 50,077 (55.0%) were males and the remaining 40,318 (45%) were females. Overall, proportion of HIV positive clients was 10.7%. The prevalence was higher in females than in males, (16% versus 6.4%).

Table 5.2. Distribution of first time VCT clients and their HIV sero-status by sex and site, Tanzania, 2004

Site	Total Tested			Male Positive		Female Positive		Total Positive	
	Male	Female	Total	Number	%	No	%	Number	%
ATC	7390	6889	14279	424	5.7	833	12.1	1257	8.8
MYC	1616	1738	3354	32	2.0	212	12.2	244	7.3
UMATI	525	472	997	38	7.2	69	14.6	107	10.7
MAKONGORO	2104	1638	3742	164	7.8	275	16.8	439	11.7
MNAZI Mmoja	1975	1751	3726	205	10.4	385	22.0	590	15.8
MAGOMENI	2019	2125	4144	142	7.0	373	17.6	515	12.4
UZIMA	2109	2138	4247	123	5.8	304	14.2	427	10.1
IMCC	722	581	1303	51	7.1	110	18.9	161	12.4
KCMC	1729	1463	3192	91	5.3	181	12.4	272	8.5
Aga Khan MZ	1651	1210	2861	113	6.8	233	19.3	346	12.1
Lindi	586	447	1033	34	5.8	50	11.2	84	8.1
Moravian	1456	1065	2521	86	5.9	195	18.3	281	11.1
AICT	1370	1015	2385	125	9.1	217	21.4	342	14.3
Mc Kay	1734	1340	3074	92	5.3	202	15.1	294	9.6
Agakhan Moro	1454	1124	2578	69	4.7	151	13.4	220	8.5
Songea	1415	1031	2446	77	5.4	172	16.7	249	10.2
Faraja	1482	984	2466	85	5.7	160	16.3	245	9.9
Sokoine	768	630	1398	27	3.5	65	10.3	92	6.6
Bukoba	1461	999	2460	38	2.6	60	6.0	98	4.0
Kigoma	1069	863	1932	37	3.5	57	6.6	94	4.9
Marangu	852	611	1463	17	2.0	67	11.0	84	5.7
Machame	912	494	1406	8	0.9	69	14.0	77	5.5
UPENDO	366	290	656	61	16.7	80	27.6	141	21.5
Sumbawanga	253	265	518	55	21.7	42	15.8	97	18.7
UHAI	410	312	722	33	8.0	44	14.1	77	10.7
Makambako	387	227	614	48	12.4	37	16.3	85	13.8
Bunda	439	330	769	14	3.2	30	9.1	44	5.7
Korogwe	280	143	423	22	7.9	17	11.9	39	9.2
Shirati	425	221	646	21	4.9	24	10.9	45	7.0
Chumbageni	388	160	548	19	4.9	15	9.4	34	6.2
Peramaho	382	303	685	24	6.3	81	26.7	105	15.3
HOPE	310	169	479	19	6.1	17	10.1	36	7.5
Karagwe	417	235	652	13	3.1	12	5.1	25	3.8
Njombe	230	137	367	10	4.3	29	21.2	39	10.6
Ngara	199	205	404	7	3.5	10	4.9	17	4.2
Isaka	170	123	293	12	7.1	15	12.2	27	9.2
SDA VCT	247	149	396	13	5.3	12	8.1	25	6.3
Mobile Morogoro	997	444	1441	36	3.6	52	11.7	88	6.1
Mobile Mwanza	1471	894	2365	78	5.3	126	14.1	204	8.6
Mobile Dar	1843	899	2742	90	4.9	138	15.4	228	8.3
Mobile Arusha	447	392	839	17	3.8	56	14.3	73	8.7
Mobile Moshi	267	231	498	14	5.2	23	10.0	37	7.4
Mobile Coast	651	278	929	26	4.0	40	14.4	66	7.1
Muhimbili	3099	3303	6402	514	16.6	1106	33.5	1620	25.3
Total	50,077	40,318	90,395	3,224	6.4	6,446	16.0	9,670	10.7

6.0 HIGHLIGHTS OF RESEARCH PUBLICATIONS IN TANZANIA

Title:

Caretakers of AIDS patients in rural Tanzania.

Author:

R. S. Kapata

Source:

International Journal of STD & AIDS 2004, 15:673-678.

Objectives:

To establish the socio-economic characteristics of caretakers of bed-ridden AIDS patients and exploring what entails caretaking in two rural communities of Rungwe district, Tanzania.

Methodology:

Data were collected from 60 households with bed-ridden AIDS patients in two rural communities between September and December 2004. Administered questionnaire was used to collect data from the main caretaker of an AIDS patient in each household and focus group discussion with 30 caretakers in each community.

Results:

The proportion of female caretakers was significantly higher than that of male caretakers; the majority of the caretakers were old. Majority of AIDS patients were family members of caretakers. The caretakers' households lacked basic needs for the patients. Some of the caretakers sold family assets in order to buy medicines for the patients. Most of the caretakers worked under stress and there was no one to counsel them. Caretakers received very little or no support from the community and the households were stigmatized. In general, people knew about HIV/AIDS transmission but their behavior did not match their knowledge.

Conclusion:

Women bear a burden of caring for AIDS patients. Males should take this challenge seriously. Caring for AIDS patients should be a concern to all members of the community by setting strategies for supporting households with AIDS patients.

Recommendation:

Items needed by care takers (e.g. gloves and disinfectants) should be subsidized to make them affordable and available in rural communities.

Title:

Cost-effectiveness of nevirapine to prevent mother-to-child HIV transmission in eight African countries.

Authors:

Michael D. Sweat, Kevin R. O Reilly, George P. Schmid, Julie Denison and Isabelle de Zoysa.

Source:

AIDS 2004, 18: 161671.

Research question:

What are the health benefits for national health care systems to invest in a short course nevirapine intervention for HIV-infected pregnant women, and what reduction in adult HIV prevalence, and reduction in the number of HIV-infected women who become pregnant, would yield equivalent reductions in infant HIV transmission as the nevirapine intervention?

Methodology:

The model outcomes from eight countries included total national program costs, the number of infant HIV infections averted, the cost per HIV infection averted, and the cost per disability-adjusted life year (DALY) saved from the intervention; calculating the reduction in adult HIV prevalence among sexually active adults and the reduction in annual number of HIV-infected women who became pregnant that would result in an equivalent reduction in HIV-infected infants. A back calculation was done to achieve equivalency in number of HIV-infected infants using the base-case model as a reference point.

Results:

Average national annual program cost was US\$4.8 million. There was an average of 1898 averted infant HIV infections. Lowering HIV prevalence among women by 1.25% or reducing unintended pregnancy among HIV-infected women by 16% yielded an equivalent reduction in infant cases. An antiretroviral drug with 70% efficacy could cost US\$152 and have the same cost per DALY averted as nevirapine at 47% efficacy.

Conclusion:

Cost-effectiveness of nevirapine is influenced by health system cost, low client uptake, and poor effectiveness of nevirapine. Small reductions of maternal HIV prevalence or unintended pregnancy by HIV-infected women have equivalent impacts on infant HIV incidence and should be part of an overall strategy to lessen numbers of infant infections.

Title:

Preferential in-utero transmission of HIV-1 subtype C as compared to HIV-1 subtype A or D.

Authors:

Boris Renjifo, Peter Gilbert, Beth Chaplin, Gernard Msamanga, Davis Mwakagile, Wafaie Fawzi, Tanzanian Vitamin and HIV Study Group and Max Essex

Source:

AIDS 2004, 18:1629-1636.

Objective:

To determine whether different HIV-1 genotypes present in a single cohort, in Dar-es-Salaam, Tanzania, showed differences in timing for transmission from mothers to their infants.

Methodology:

The maternal viral load were determined, transmission time, and the HIV-1 envelope (env) subtype of 253 HIV-infected infants enrolled in a randomized double-blind placebo-controlled trial to examine the efficacy of vitamins in decreasing mother-to-child transmission in Tanzania. Classification of HIV-1 positivity in utero was based on PCR results at birth. Infants were classified as intrapartum infected if they scored negative for the sample collected at birth and positive for the sample collected at 6 weeks of age.

Results:

There were significant differences in the distribution of transmission time according to subtype. A higher proportion of HIV-1 with subtype C env (C-env) was transmitted in utero than HIV-1 with subtype A (A-env), subtype D env (D-env) or both combined.

Conclusion:

The identification of patterns of mother-to-child transmission time among HIV-1 genotypes may be useful in the selection of drug regimens for chemoprophylaxis. The efficacy of regimens administered only at labor may not protect as large a fraction of infants born in geographical regions with subtype C-env epidemics as compared to epidemics in regions where subtype A-env and D-env predominate in the population.

Title:

Factors influencing acceptability of voluntary counseling and HIV-testing among pregnant women in Northern Tanzania.

Authors:

M. M. de Paoli, R. Manongi and K-L Klepp.

Source:

AIDS CARE (May 2004), Vol. 16, No. 4:411-425.

Research question:

Whether there are sociodemographic and psychological differences between urban and rural women with regard to MTCT of HIV/AIDS; B) how much pregnant women know and understand about HIV/AIDS and the risk of MTCT of the HIV virus? C) What factors are associated with willingness to accept VCT? D) What are pregnant women's perceived barriers as regards to accepting VCT that is offered during pregnancy?

Methodology:

A cross-sectional interview survey of 500 pregnant women, complemented by focus group discussions, was conducted among pregnant women at nine governmental clinics in Moshi urban and rural districts in Kilimanjaro Region of Tanzania between June and September 1999. The study employed purposive sampling design in which when pregnant women come to antenatal clinics were invited to participate.

Results:

The mean age of the survey sample was 25 years. The educational level of the participants was generally low, majority were Christians. Women attending urban clinics, differed significantly from those attending rural clinics with respect to education, type of employment, religion and parity. Women knowledge of the routes of HIV transmission did not vary significantly between the two settings, although urban women generally scored better than their rural counterparts. Constructs derived from the Health Belief Model explained 41.7% of women's willingness to accept VCT during pregnancy. Perceived high personal susceptibility to HIV/AIDS, barriers related to confidentiality and partner involvement, effective alternative feeding methods and religion were associated with willingness to accept VCT.

Conclusion:

Women's acceptance of VCT seems to depend upon their perceiving that VCT and alternative feeding strategies provide clear benefits, primarily for the child. Whether a positive attitude to VCT and alternative feeding strategies are transformed into behavior depends on a set of complicated decisions in which several potential psychological consequences are assessed. Sharing the diagnosis may not have the intended effect if there is a lack of sensitivity to the women's fear of blame and rejection.

Recommendation:

If pregnant women are to fully participate in and benefit from mother-to-child transmission prevention efforts, their partners must be committed and involved in the process.

Title:

Association between Low Birth Weight and Infant Mortality in Children Born to Human Immunodeficiency Virus 1-infected Mothers in Tanzania.

Authors:

Ruilan Wei, Gernard L. Msamanga, Donna Spiegelman, Ellen Hertzmark, Karim Manji and Wafaie W. Fawzi.

Source:

The Pediatric Infectious Disease Journal, 2004 Vol. 23, No. 6:530-535.

Objective:

To investigate the relationship between low birth weight and infant mortality among children born to human immunodeficiency virus (HIV)-infected mothers in Tanzania.

Methodology:

A total of 1078 HIV-infected pregnant women in Tanzania were followed up until delivery and with their infants thereafter. The babies' HIV status was assessed at birth, 6 weeks and every 3 months thereafter. Cox proportional hazards was used to estimate the association between low birth weight with neonatal, postnatal and infant mortality and further examining whether the association between low birth weight and mortality was modified by pediatric HIV infection.

Results:

Among 823 singletons, low birth weight strongly related to neonatal mortality. The association with postnatal mortality was modified by child's HIV status. Among infants who were either negative or indeterminate at 6 weeks of age, low birth weight was associated with a 3-fold increased risk of mortality. In the positive infants, however, the association was no longer significant.

Conclusion:

Efforts to reduce incidences of low birth weight would enhance the benefit of preventing HIV transmission. Even in population with no access to antiretroviral treatments, interventions to reduce incidences of low birth weight would result to significant reduction in infant mortality.

Title:

Selenium Status Is Associated with Accelerated HIV Disease Progression among HIV-1-Infected Pregnant Women in Tanzania.

Authors:

Roland Kupka, Gernard I. Msamanga, Donna Spiegelman, Steve Morris, Ferdinand Mugusi, David J. Hunter and Wafaie W. Fawzi.

Source:

Nutrition Journal 134:2556-2560 (2004).

Objective:

To examine the implicated association between selenium status and HIV disease progression among pregnant women in Tanzania.

Methodology:

The study population consisted of women eligible for a trial examining the efficacy of vitamin supplementation in relation to vertical transmission of HIV from mother to child and other health outcomes. Blood samples were collected from subjects at baseline, delivery and at 6 months intervals after. The Kruskal-Wallis test was used to compare means of continuous variables across quintiles of plasma selenium levels; the χ^2 test was constructed to compare categorical variables. The association between selenium levels and mean CD4 cell counts over time was analyzed using a restricted cubic spline model that allows for arbitrary nonlinear relations.

Results:

Among 949 HIV-1-infected Tanzanian women who were pregnant, the association between plasma selenium levels and survival and CD4 counts levels were prospectively examined over time. Over the 5.7-y median follow-up time, 306 of 949 women died. In a Cox multivariate model, lower plasma selenium levels were significantly associated with an increase risk of mortality. Each $0.1\mu\text{mol/l}$ increase in plasma selenium levels was related to a 5% decreased risk of mortality. Plasma selenium levels were not associated with time to progression to CD4 cell count but were weakly and positively related to CD4 count in the first years of follow-up.

Conclusion:

Selenium status may be important for clinical outcomes related to HIV disease in sub-Saharan Africa.

Recommendation:

There is need to conduct randomized, controlled trials of sufficient sample size to resolve existing uncertainties regarding the effectiveness of selenium supplements.

Title:

The Sexual health of pupils in years 4 to 6 of primary schools in rural Tanzania.

Authors:

J. Todd, J. Changalucha, D. A. Ross, F. Mosha, M. Plummer, R. Balira, H. Grosskurth, D. C. W. Mabey and R. Hayes.

Source:

Sex Transm Infect (2004) 80:35-42.

Objective:

To describe the sexual health of pupils in years 4 to 6 of 121 rural primary schools in north western Tanzania, before the implementation of an innovative sexual health intervention in 58 of the schools.

Methodology:

A cross sectional survey of primary school pupils in rural Tanzania was carried out. The study population comprised of pupils registered in years 4 to 6 of 121 rural communities in 1998. Basic demographic information was collected from all pupils. Those born before 1 January 1985 (aged 14+), were invited to participate in the survey; asked about their knowledge and attitude towards sexual health issues and their sexual experiences. Urine specimen was requested and tested for HIV, Chlamydia trachomatis (CT), Neisseria gonorrhoeae (NG) and, for females, pregnancy.

Results:

9283 pupils born before 1 January 1985 were enrolled and provided demographic information and a urine sample. Male pupils were significantly older than females but other demographic characteristics were similar between the sexes. 14 (0.2%) of the enrolled pupils (4 male and 10 female) were HIV positive, 83 (0.9%) were positive for CT, and 12 (0.1%) for NG. 32 female pupils were positive by pregnant test. Sexual experience was reported by one fifth of primary school girls and by almost half of boys. Only 45/114 (39%) girls with biological markers of sexual activity reported having had sex.

Conclusion:

HIV, CT, NG and pregnancy were present though at low levels among pupils in years 4 to 6 of primary school. A high proportion of pupils with biological markers of sexual activity denied ever having had sex.

Title:

Are Infant Feeding Options that Are Recommended For Mother with HIV Acceptable, Feasible, Affordable, Sustainable and Safe? Pregnant women's perspectives.

Authors:

Marina Manuela de Paoli, Rachel Manongi and Knut-Inge Klepp

Source:

Public Health Nutrition 7(5), 611-619.

Objective:

To investigate pregnant women's views on infant feeding options recommended for HIV-infected women.

Methodology:

A structured interview survey complemented with focus group discussions were used to collect data from pregnant women enrolled in antenatal clinics in Moshi urban and rural districts, Tanzania. Five hundred pregnant women participated in the interview survey and 46 pregnant women participated in six focus group discussions.

Results:

The participating women reported that they would change to an alternative infant feeding method if they were found to be HIV-infected and were advised to do so. Cow's milk was regarded as the most feasible infant feeding method for local HIV-infected mothers. Infant feeding formula was regarded as too costly, but if recommended by health workers and distributed free of charge, the majority of the women (82%) were confident that they would then choose this option. In the focus group discussions, women were less optimistic and expressed great concern for the social consequences of not breast-feeding. The safety of exclusive breast-feeding was questioned. Less common infant feeding methods, such as expressed heat-treated breast milk and wet-nursing, were not regarded as viable options. Several social barriers to replacement feeding were identified in the focus group discussions, including possible lack of support from partner and potential negative reactions from the community.

Conclusion:

Future research on infant feeding options should include the broader cultural context and the psychological stress that HIV-infected women face when choosing infant feeding methods.

Title:

Child Sexual Abuse in Tanzania and Kenya

Author:

Kevin Lalor

Source:

Child Abuse and Neglect 28 (2004):833-844

Objective:

To examine the various commentaries and reports extant, toward an overview of the nature and frequency of child sexual abuse in Tanzania and Kenya.

Methodology:

Contacts were made with academics, government departments, NGOs, and UN agencies. This was followed by a field trip in the summer of 2001 where all available reports were examined and a wide range of interviews conducted.

Results:

Little empirical data exist on child sexual abuse in Tanzania. It is widely perceived that it may be increasing as a result of AIDS sufferers' attempts to "cleanse" themselves. The breakdown of traditional childcare systems, foreign influences, poverty, and the lowly position of girls in society are also implicated. More research has been conducted in Kenya. It is clear that first coitus occurs at a young age for many Kenyan children and adolescents. Also, a degree of force, trickery, or material exchange is not uncommon in adolescent sexual relations.

Conclusion:

Child sexual abuse is under-researched in Tanzania and Kenya. Studies by UN agencies such as United Nation's Fund (UNICEF) and the International Labour Organization (ILO) have focused on the commercial sexual exploitation of children, to the neglect of more pervasive abuse in children's own communities by family, relatives, and neighbors. Given the high incidence of HIV/AIDS in both countries, it is important to know if the epidemic is increasing the risk of rape or incest for children.

Title:

Secretive Females or Swaggering Males? An Assessment of the Quality of Sexual Partnership Reporting in Rural Tanzania.

Authors:

Soori Nnko, J Ties Boerma, Mark Urassa, Gabriel Mwaluko, Basia Zaba

Source:

Social Science & Medicine 59 (2004) 299-310.

ISSUE:

Analysis of data collected in the context of a longitudinal study in rural Tanzania, where a sexual partnership module was applied to all participating men and women in the study population.

Methodology:

The study design included all men and women of reproductive ages and did not involve sampling; data provide a unique opportunity to compare the consistency of aggregate measures of sexual behavior between men and women living in the same villages.

Results:

The analysis shows that non-marital partnerships were common amongst single people of both sexes around 70% of unmarried men and women report at least one sexual partner in the last year. However, 40% of married men also report having non-marital partners, but only 3% of married woman did so. Single women reported about half as many multiple partnerships in the last year as men. Under-reporting of non-marital partnerships was much more common among single women than among married women and men. Furthermore, women were more likely to report longer duration partnerships and partnership with urban men or more educated men than with others.

Conclusion:

If a woman reports multiple partners, biological data indicate that she is at high risk of contracting HIV. For men, however, there is only a weak association between number of partnership and the risk of HIV, and can not be excluded that men, especially single men, exaggerate the number of sexual partners.

Title:

A Randomized Trial of Multivitamin Supplements and HIV Disease Progression and Mortality

Authors:

Wafaie W. Fawzi, Gernard I. Msamanga, Donna Spiegelman, Ruilan Wei, Saidi Kapiga, Davis Mwakagile, Fernand Mugusi, Ellen Hertzmark, Max Essex and David J. Hunter

Source:

The New England Journal of Medicine (2004), 351:23-32

Objective:

To examine the effects of micronutrient supplements - vitamin A alone, multivitamins including vitamins B-complex, C, and E, and multivitamins plus vitamin A- on the risks of clinical disease progression, HIV related complications, CD4 cell counts and viral load in HIV-positive women in Tanzania.

Methodology:

Enrolled 1078 pregnant women infected with HIV in a double-blind, placebo-controlled trial in Dar es Salaam, Tanzania, The median follow-up with respect to survival was 71 months (interquartile range, 46 to 80).

Results:

Of 271 women who received multivitamins, 67 had progression to World Health Organization (WHO) stage 4 disease or died – the primary outcome – as compared with 83 of 267 women who received placebo (24.7 percent vs. 31.1 percent, relative risk, 0.71; 95 percent confidence interval, 0.51 to 0.98; p= 0.04). This regimen was also associated with reductions in the relative risk of death related to the acquired immunodeficiency syndrome (0.73; 95 percent confidence interval, 0.15 to 1.04; p=0.09), progression to WHO stage 4 (0.50; 95 percent confidence interval, 0.28 to 0.90; p=0.02), or progression to stage 3 or higher (0.72; 95 percent confidence interval, 0.58 to 0.90; p= 0.003). Multivitamins also resulted in significantly higher CD4+ AND CD8+ cell counts and significantly lower viral loads. The effects of receiving vitamin A alone were smaller and for the most part not significantly different from those produced by placebo. Adding vitamin A to the multivitamin regimen reduced the benefit with regard to some of the end points examined.

Conclusion:

Multivitamin supplements delay progression of HIV disease and provide an effective, low - cost means of delaying the initiation of antiretroviral therapy in HIV-infected women.

Tanzania HIV/AIDS Indicator Survey 2003 – 04

Tanzania Commission for AIDS, National Bureau of Statistics, and ORC Macro, National AIDS Control Programme, USAID, Tanzania: March, 2005

Objective:

- To get the National population baseline data on the prevalence of HIV Infection. In the country.
- Assess levels and trends in knowledge and attitudes about HIV/AIDS and sexual behavior
- Collect information on chronically sick adults, orphan hood, and amount of care and support needed for PLWHA
- How prevalence, knowledge, and behavior vary by age, sex, region, education, poverty and other characteristics

Methodology:

A representative probability sample of 6,900 households was selected for THIS. As a result of disproportionate sampling, the THIS sample is not self weighting at the national level and weighting factors have been applied to the data.

All household living in the selected clusters were selected. The second stage of selection involved the systematic sampling of households from the list. Two types of questionnaires were used in the survey: the Household and the individual questionnaires.

Results:

Among 13,350 clients who consented to be tested 7% of adults were HIV infected; (7.7% of women are infected and 6.3% of men are infected) The highest prevalence was in Mbeya (14%), Iringa (13%) and Dar es Salaam (11%) and 8 % of couples had discordant results. 99% of Tanzanians have heard of HIV/AIDS

- Almost 90% of adults know that having only one uninfected partner can reduce the chance of getting AIDS
- 4 in 5 adults know that a healthy-looking person can have AIDS
- Almost 4 in 5 adults know that HIV cannot be transmitted by witchcraft or by sharing food with someone who has AIDS
- The majority of adults have accepting attitudes towards those living with HIV/AIDS
- Most accept women's ability to negotiate safer sex with her husband or request using a condom if she knows he has an STI
- Attitudes towards teaching children about condom use are generally positive
- Women and men have their first sex at age 18
- Women's age at first sex has increased.
- Fewer men and women are having sex with multiple partners than they did in 1999.
- 15% of Tanzanians have been tested for HIV.
- 44% of young women and 49% of young men know 5 of the most important elements of HIV transmission
- Half of young women and three-quarters of young men know a place to get condoms
- 17% of young women and 26% of young men said they used a condom at first sex
- Among sexually active youth, 37% of women and 81% of men engaged in higher risk sexual activity; men were less likely to use condoms

Conclusions:

The THIS results are in turn expected to improve the calibration of the annual sentinel surveillance data, so that trends in HIV infection can be more accurately measured in the intervals between household surveys.

Title:

Assessment of clinical case-definition for HIV/AIDS in Tanzania.

Authors:

Amirali W, Moshiro C, Ramaiya K.

Source:

East Africa Medical Journal (2004) 81(5):226-9

OBJECTIVE:

To evaluate the usefulness of World Health Organisation (WHO's) clinical case-definition (CCD) for AIDS in private hospitals.

Methodology:

A prospective study was done at Shree Hindu Mandal Hospital, Dar es Salaam, Tanzania. A total of 601 patients (> 14 years) were studied from January 1995 to December 1997. Using HIV test results as a reference standard, sensitivity, specificity, positive predictive values (PPV) and negative predictive values of signs and symptoms were calculated. Multiple logistic regression was used to determine a set of predictive symptoms and signs. Stepwise logistic regression modelling was used to choose the final model.

Results:

The frequently occurring signs and symptoms among the 473 sero-positive patients were fever (226), oral candidiasis (167), weight loss (161), chronic cough (157), diarrhoea (100) and pulmonary tuberculosis in 69 cases. The presence of anorectal lesions and the rarity of pneumocystis carinii pneumonia in this study are important findings. Seven clinical characteristics predicted HIV infection. These included pulmonary tuberculosis ($p=0.009$), lymphadenopathy ($p=0.007$), diarrhoea ($p=0.000$), chronic cough ($p=0.001$), dermatitis ($p=0.003$), herpes zoster ($p=0.01$) and oral candidiasis ($p=0.000$).

Conclusions:

A greater number of HIV positive patients presented with signs and symptoms different from those proposed by WHO's CCD were observed in this study. With environmental pathogens varying from one geographical region to another and new ones appearing, opportunistic disease cannot be constant in AIDS patients. Therefore, AIDS diagnosis based on clinical case definition alone without at least one positive HIV antibody test is inaccurate and no longer justified.

Title:

Exploring the association between HIV and violence: young people's experiences with infidelity, violence and forced sex in Dar es Salaam, Tanzania.

Authors:

Lary H, Maman S, Katebalila M, McCauley A, Mbwambo J.

Source:

Int Farm perspect. 2004 Dec;30(4):200-6

Context:

Prior research has shown a strong correlation between HIV infection and a history of intimate partner violence, particularly among young women. However, the role violence plays in the sexual relationships of young people in Sub-Saharan Africa is not well understood.

Methods:

Locally trained interviewers conducted semi-structured interviews with 40 young men and 20 young women aged 16-24 who were recruited from public venues in Dar es Salaam, Tanzania.

Results:

The participants described complex interactions among violence, forced sex and infidelity in their sexual relationships. Men who were violent toward female partners also frequently described forced sex and sexual infidelity in these partnerships. Men with multiple concurrent sexual partners reported becoming violent when their female partners questioned their fidelity, and reported forcing regular partners to have sex when these partners resisted their sexual advances. Youth who felt that violence and forced sex could not be justified under any circumstances were often those who had not yet initiated sexual relationships or who were in monogamous partnerships.

Conclusions:

The association between HIV and violence identified among young people in prior research may be partially explained by their experiences with infidelity and forced sex in their intimate partnerships. HIV prevention interventions that fail to take into account the infidelity, violence and forced sex frequently involved in youth's sexual relationships will have a limited impact.

Title:

Collaboration between the National Tuberculosis Programme and a nongovernmental organisation in TB/HIV care at a district level: experience from Tanzania.

Authors:

Wandwalo E, Kapalata N, Tarimo E, Corrigan CB, Morkve O.

Objective:

To determine the feasibility of establishing collaboration between the tuberculosis Programme and an NGO in TB/ HIV care at a district level in Tanzania.

Methods:

Quantitative and qualitative study designs involving TB as well as HIV suspects and patients

together with health workers were conducted between December, 2001 and September, 2002. Results: A total of 72 patients and 28 key informants were involved. The collaboration was in the following areas; voluntary counseling and testing for HIV, diagnosis and treatment of TB, referral and follow up of patients and suspects, home based care, psychological support and training. Both the Tuberculosis Programme and NGO benefited from the collaboration. TB case detection among PLWA increased more than three folds and TB treatment was integrated in home based care of NGO. The main barriers identified in this study were; poor communication, poor referral system and lack of knowledge and skills among health staff.

Conclusion:

The study has shown that it is possible for a Tuberculosis Programme and a non governmental organisations to collaborate in TB/HIV care. The study has also identified potential areas of collaboration and barriers that needed to be overcome in order to provide such comprehensive services at a district level.

Title:

Acceptance of HIV Testing Among Pregnant Women in Dar-es-Salaam, Tanzania.

Authors:

Westheimer EF, Urassa W, Msamanga G, Baylin A, Wei R, Aboud S, Kaaya S, Fawzi WW.

Source:

J acquir immune Deficie Synd. 2004 Sept 1;37(1):1197-1205

Background:

Increased prevention of maternal-to-child transmission of HIV-1 has now become possible due to the availability of effective antiretroviral drugs in developing countries. It is necessary for pregnant women to know their HIV status in order to administer timely treatment to reduce transmission of the virus. This study assesses correlates of acceptance of testing for HIV infection in the antenatal setting in Dar-es-Salaam, Tanzania.

Methods:

Between August 13, 2001 and November 27, 2002, 14,235 pregnant women were offered screening for HIV as part of routine prenatal care. Demographic information pertaining to the women and their partners, if applicable, was collected. Univariate and multiple logistic regression analyses were carried out.

Results:

The majority of women were married monogamously (60.0%), had </=7 years of education (75%), and were unemployed (70.4%). Of the 14,235 women offered screening for HIV, 10,991 (77.2%) accepted. Site of recruitment was significantly associated with screening acceptance (P for trend <0.0001). Additionally, age, education, marital status, and partner's occupation were significant predictors of testing acceptance.

Conclusion:

The site at which recruitment occurs is a significant factor in determining a woman's odds of accepting HIV testing. The site covariate includes such factors as individual counselor effects, length of waiting time, and length of time the site has been operational.

Annex 1: Prevarlence of HIV infection among pregnant women attending ANC

Site	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Kagera (Bukoba Town)					22.20	20.00	27.70	16.10	17.30		13.70			7.00	12.50		8.50	
Magononi (Dar es Salaam)	3.70		7.80	8.90	9.00	10.30	11.00	16.10	13.80	12.20	13.00	13.70						
Dar-es-Salaam (Kasorobo-Temeke)						10.30		15.30		7.30								
Dar-es-Salaam (Kigamboni-Temeke)														14.10	10.10	12.00		
Dar es Salaam (Buguruni-IIala)																	16.40	
Dar es Salaam (Oysterbay-Kinondoni)																	11.00	
Kilimanjaro (Majengo)						5.90	6.50	7.70									7.60	
Musoma regional hospital(Mara)						9.00	7.00	8.00	7.20									
Mara (Nyasho)																		
Mbeya (Kiwaniampaka)	7.00	10.60				17.00	22.30	19.50		17.00	22.50	20.50	23.00	23.30		17.90		
Mbeya (Kyela)		21.20	14.60	17.50	30.40	27.20	27.50	33.30	25.90	25.00	24.00	29.50	21.60			17.20		
Mbeya (Mbozi)									15.00	13.90	17.00	24.00					19.00	
Mbeya (Meta)	10.30	16.90				25.00	13.70	16.00		14.60	17.90	12.50	13.50	17.00				
Mbeya (Ruanda)										24.00	18.10	18.80	17.50	20.70				
Mbeya (Mwanjelwa)	11.00	7.30				11.00	23.30	19.60										
Mtwarra (Ligula)															12.50			
Mtwarra (Tandahimba)																4.00		
Mwanza (Igomma)																13.80		
Mwanza (Kisesa)																	10.80	
Mwanza (Makongoro)	8.00	11.70	12.30	11.20	10.00	12.30	11.70	8.90									16.40	
Rukwa (Sumbawanga)									12.00	23.30	22.20	21.00						
Rukwa (Namanyere)									11.30	8.30	19.00	11.20	11.20					

Site	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Ruvuma (Songea)						9.70	16.10	15.70	14.20		11.00							
Dodoma (Makole)						21.00	25.00											9.80
Iringa (Mafinga)						3.50	6.70	3.20	5.60		4.00							
Ruvuma (Namtumbo)																		
Dodoma (Handali)																		0.50
Mbeya (Chimala)	4.20	6.30	8.80	9.50	8.00	10.80	16.00	10.50	17.00	15.90	12.50	12.10	15.20					17.10
Kagera (Katoro)																		3.00
Kagera (Kimeya)																		6.10
Kagera (Nkwenda)																		3.90
Dodoma (Bahi)																		1.20
Dodoma (Kibajiswa)						2.30	6.40				9.10	10.00	20.00	19.20	16.60			
Kilimanjaro (Umbwe)																		8.80
Kilimanjaro (Masama)																		2.30
Kilimanjaro (Hedaru)																		5.50
Mbeya (Ilembo)																		7.10
Mbeya (Isoko)	2.90	2.00	2.40	6.60	18.00	8.50	8.00	10.30	7.20	8.10	10.20	19.10	13.50					
Mbeya (Itete)	1.70	9.10	6.40	3.90	5.30	15.50	5.10	14.80	5.60	14.80	11.80	11.60	23.30					
Mbeya (Mwanbani)	12.00	8.50	12.90	8.00	10.70	13.00	17.50	16.00	13.70	14.50	11.00	13.00						
Mtwara (Mangaka)																		4.30
Mtwara (Nanyamba)																		4.00
Mwanza (Igekemaja)																		4.20
Mwanza (Mkula)																		
Ruvuma (Madaba)																		

