THE UNITED REPUBLIC OF TANZANIA
MINISTRY OF HEALTH
TANZANIA MAINLAND

National AIDS Control Programme

Surveillance of HIV and Syphilis
Among Antenatal Clinic Enrollees
2001 - 2002

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Abbreviations

AIDS	Acquired Immune Deficiency Syndrome
ANC	Antenatal clinics
BSS	Behavioral Surveillance Survey
CDC	U.S Centres for Disease Control and Prevention
DBS	Dried blood sports filter paper cards
ELISA	Enzyme Linked Immunosorbent Assay
HIV	Human Immunodeficiency Virus
MOH	Ministry of Health
MUCHS	Muhimbili University College of Health Sciences
NACP	National AIDS Control Programme
NIMR	National Institute for Medical Research
QA	Quality assurance
RPR	Rapid Plasma Reagin
STD	Sexually transmitted diseases
STI	Sexually transmitted infections
UNAIDS	Joint United Nations Programme on AIDS
UNDP	United Nations Development Programme
VDRL	Venereal Disease Research Laboratory
WHO	World Health Organisation

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EXECUTIVE SUMMARY

This report provides the results of the antenatal clinic HIV and syphilis sero-surveillance conducted in Mainland Tanzania during 2001-2002. The goal of this surveillance is to determine HIV and syphilis sero-prevalence among antenatal clinic attendees and examine factors associated with infection.

A total of 7,275 women attending antenatal clinics for the first time for any pregnancy were enrolled in surveillance from 24 clinics in 6 regions of Tanzania Mainland from January 15 to April 14, 2002. Of these, 695 women tested HIV positive resulting in an overall HIV prevalence of 9.6% (95% CI=8.9-10.2), with an observed range of 5.6% (95% CI = 4.4% - 6.7%) in Kagera to 16.0% (95% CI = 13.9% - 17.8%) in Mbeya. Prevalence varied by location, attendees from clinics located in urban areas had significantly higher HIV prevalence than those recruited from rural clinics. Age-specific HIV prevalence was highest in women aged 25-34 years (13%) compared to those aged 15-24 years (7.6%) and 35-48 years 7.0%). Single women had higher prevalence than married women. HIV prevalence among single women who had been pregnant before (18.3%) was nearly twice that of married women who had been pregnant before (9.8%). In some regions, women that reported some primary education or more had higher prevalence than women with no education. HIV prevalence was unaffected by duration in residence.

In addition to HIV testing, 7,201 women attending antenatal clinics for the first time for any pregnancy were screened for syphilis infection, 590 women tested positive for syphilis resulting in an overall syphilis prevalence of 8.2% (95%CI=7.6-8.9), with a range of 3.0% in Kilimanjaro to 12.3% in Dodoma. Age-specific syphilis prevalence was highest for women aged 35 years and older. HIV infected women had a higher prevalence of syphilis at 12.4% compared to 7.8% among HIV negative women, these differences were statistically significant, p=0.001.

Results of the first national cross-sectional behavioural surveillance conducted among young people aged 15-24 and living in the communities surrounding ANC sero-surveillance sites in Tanzania are presented in a separate report.

INTRODUCTION

Formed in 1964, The United Republic of Tanzania is a union between Tanganyika and Zanzibar. The country is divided into twenty-six regions: 21 on the mainland and 5 on Zanzibar. Physically, Tanzania is the largest country in East Africa, occupying an approximate area of 945,087 km^2, and sharing a border with 8 neighbouring countries: Kenya and Uganda to the north; Rwanda, Burundi and Democratic Republic of Congo to the west, and Zambia, Malawi and Mozambique to the South.

According to 2002 population census, the total population of Tanzania is 34,569,232 with 23% living in urban and 77% living in rural areas. It is a relatively young population with 46% of the population aged less than 15 years. Life expectancy is 49 years for males and 51 years for females. The annual population growth rate is 2.9%.

The first AIDS cases were discovered in the Kagera region in 1983. In late 80's sentinel HIV and syphilis sero-surveillance in antenatal clinics (ANC) were initiated in one region. In the early 90s, the Tanzania National AIDS Control Programme (NACP) developed a protocol for ANC HIV and syphilis sero-surveillance, and expanded surveillance to 11 of the then 20 regions of mainland Tanzania. This protocol was implemented until 1999, when the NACP undertook a comprehensive review resulting in revised and improved methods for HIV and syphilis surveillance.

During 2000-2002 HIV and syphilis surveillance was strengthened by three sequential core activities. A multidisciplinary team examined strengths and weaknesses of the existing surveillance system in June 2000. This effort resulted in the document, "Guidelines for Monitoring and Evaluation During Mid-Term Plan III, 2000-2002." These guidelines describe principles used in HIV/AIDS and syphilis surveillance, discuss methods of behavioural surveillance among youth, and introduce criteria for monitoring and evaluating prevention programmes. Using these and other resources, the NACP revised the protocol for ANC surveillance. New methods resulting from this revision included a 3-month data collection period, the introduction of dried blood spot filter paper cards (DBS) technology and standardization of HIV test approaches and quality assurance.

The objectives of ANC surveillance are to determine HIV and syphilis prevalence among pregnant women attending selected antenatal clinics, and to monitor trends over time. Between January 15 and April 14, 2002, a new round of HIV and syphilis sero-surveillance was conducted at 24 ANC sites located in six regions of Tanzania: Dar es Salaam, Dodoma, Kagera, Kilimanjaro, Mbeya and Mtwara. Sero-surveillance was conducted at urban, semi-urban and rural clinics.

In addition to sero-surveillance, the NACP conducted a Behavioral Surveillance Survey (BSS) to track trends in HIV/AIDS-related knowledge, attitudes, and behaviours among youth aged 15-24 residing in communities surrounding ANC surveillance sites. Results of BSS are presented in a separate report. Over time, this complementary behavioural information will help identify indicators, evaluate interventions, and monitor change in HIV/STD risk behaviours.

The information generated from this sero-surveillance activity is vital for determining the epidemiology of HIV and syphilis within Tanzania. For prevention planning, this information will be used to describe transmission patterns, allow projections of HIV infections and identify groups at greatest risk for HIV infection.

Finally, this information is critical for setting priorities, designing interventions and evaluating the impact of prevention and care programmes.

A serosurvey was conducted between January 15 and April 14, 2002 among pregnant women attending selected ANC in Tanzania.

2.1 Study population, Regions and ANC site selection

All pregnant women presenting for the first time to a selected ANC for any pregnancy between January 15th and April 14th, 2002, were included in the study.

In 1996 Tanzania Demographic and Health Surveys (DHS) clustered regions of Tanzania mainland into six geographical zones. One region was selected from each of the six geographic zones, to participate in 2001 - 2002 ANC surveillance (Annex 1)[1]. Region selection criteria included participation in prior national ANC serosurveillance efforts and the availability in the region of some data on HIV prevalence.

Twenty-four ANC were selected based on catchment population size, average number of monthly bookings, road accessibility and previous inclusion in national surveillance (Annex 2). Except for Mbeya and Dar es Salaam, four ANC per region of the following types were selected:

- one urban - - ANC located in health facilities within the regional town
- one semi-urban - - ANC located in health facility in town other than in regional town, and
- two rural - -ANC located in a rural health centre, dispensary or an independent clinic.

Semi-urban sites located along a major road that cross either a border town or the region are classified as border or roadside, respectively. In addition to the one urban site, one roadside semi-urban, one border and one rural ANC were selected in Mbeya. Dar es Salaam being the major city in Tanzania, all four sites are urban.

2.2 Surveillance protocol training

All staff from selected ANCs attended a two-day surveillance-training workshop in October 2001, in Dar es Salaam. The training included instruction in the study protocol, laboratory theory, phlebotomy and use of the vacutainer blood collection system, rapid plasma reagin (RPR) testing for syphilis antibody detection and dried blood spots (DBS) preparation and storage. Role-playing reinforced the sequence of steps from client encounter, to collection of demographic data and blood collection, RPR testing, DBS preparation, storage and shipping. Participants included ANC nurses, laboratory personnel and Regional and Deputy Laboratory Technologists of all surveillance sites. Laboratory technologists from Muhimbili University College of Health Sciences (MUCHS), Department of Microbiology and surveillance staff from NACP facilitated the course, which was conducted entirely in Kiswahili.

2.3 Field Supervision

To ensure adequate personnel supervision and quality control of field activities, the NACP assembled a roving study team of laboratory and surveillance staff to monitor ANC staff adherence to the protocol, DBS preparation and storage technique and availability of supplies at all sites. Supervising teams visited each site according to a regular timetable and completed

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[1] Tanzania Demographic and Health Survey 1996; August 1997.

a monitoring checklist. The teams also reviewed the stored DBS and data collection forms to confirm that collected demographic information correlated correctly with the stored specimens.

2.4 Specimen Sampling, Data Collection and Transport

Data were obtained from all pregnant women attending a study ANC for their first pre-natal care visit for any pregnancy. A blood sample was taken for RPR and HIV testing.   Samples were collected continuously for 3 months between January 15 and April 14, 2002 from all sites, and data were entered onto a carbonized duplicate data collection form labeled with the patient's unique surveillance number. Study variables included age, marital status, parity, educational level, distance from residence to ANC, and duration in residence (Appendix 3).

After obtaining consent, a blood sample was taken for RPR. Following RPR testing, DBS for HIV testing were collected from the residual RPR sample. ANC staff applied 100μl of whole blood to each of five circles on a DBS card, which then was left to dry at room temperature. Dried DBS were stacked in plastic envelopes, and stored with desiccant packs and their completed data collection forms. Desiccants packs were changed as needed. ANC staff posted completed data collection forms and DBS for HIV testing by weekly courier to the National HIV Reference Laboratory at MUCHS using funds supplied during supervisory team visits. NACP monitored the volume of DBS received by Muhimbili from each site and contacted sites with abnormally posted numbers.

2.5 Syphilis Testing and Treatment
RPR test results were recorded directly on the data collection form or laboratory investigation request form. Women whose RPR test results were positive were offered treatment based on the National STD Treatment Guidelines[2].

2.6 HIV testing
The National HIV Reference Laboratory at MUCHS collaborated with the U.S. Centres for Disease Control and Prevention (CDC) on a DBS HIV testing protocol and algorithm. Due to the large number of DBS samples collected, three additional Regional Laboratory Technologists from participating surveillance regions joined technologists at the National HIV Reference Laboratory in testing the samples. At the laboratory, the 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 positive on the first ELISA underwent a second ELISA test, Wellcozyme HIV 1-2 (GACELISA, Murex, UK). Specimens that reacted positive on the second test were considered positive. Specimens that reacted negative on the second test were considered negative.

2.7 Quality Assurance
Ten per cent of all samples were randomly selected by MUCHS and sent for quality assurance (QA) testing to the HIV Immunology and Diagnostics laboratory at CDC headquarters in Atlanta, GA. Every 10th sample starting from number 01 at each site was selected, bringing the total number of specimens sampled for QA to 746. Samples were shipped to CDC headquarters and tested using Vironostika ® Uni-Form II Plus Ag/Ab ELISA test (Biomerieux, The Netherlands). Specimens with negative results underwent no further testing and were considered negative. Specimens positive on the first ELISA underwent a

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[2] Ministry of Health Tanzania, STD Training for Clinicians; User's Manual

second ELISA test Wellcozyme HIV 1-2 (GACELISA, Murex, UK). Specimens that reacted positive on the second test were considered positive. Specimens that reacted negative on the second test were considered negative. Testing results from QA performed at CDC headquarters and ANC surveillance were examined for concordance. Western Blot testing was performed on discordant specimens.

2.8 Ethical Clearance

The Ministry of Health awarded ethical clearance to this surveillance protocol following review by three independent reviewers. Because HIV test results were not linked by name and tests were performed on residual blood from routine syphilis screening, obtaining informed consent was not warranted. All information linking the sample to the client was removed and DBS HIV testing occurred anonymously.

2.9 Data Entry and Analysis

Laboratory technologists entered HIV test results on their respective data collection forms following testing at MUCHS and delivered completed forms to NACP. NACP data entry clerks performed double entry of data manually into EpiInfo programme. The two files were compared and incorrect entries were corrected.

Data were analysed initially by a team of researchers from, NACP, MUCHS, NIMR and CDC, initially during a weeklong analysis meeting, followed by several weeks of consensus gathering and review. ANC HIV and syphilis prevalence rates were calculated by age, marital status, parity, educational level, distance from residence to ANC and duration in residence. Prevalence estimates were calculated with 95% confidence intervals (CI) to guide interpretation. Data were analysed using the statistical software packages EpiInfo 2002 (Database and statistics software for public health professionals, July 2002) and Stata for windows 7.0.

3.1 HIV prevalence

A total of 7,275 antenatal clinic attendees were enrolled in the ANC serosurveillance study from 24 clinics in 6 regions of Tanzania between January 15 and April 14, 2002. The number of enrolees ranged from 862 in Mtwara to 1,697 in Dar es Salaam (Tables 1 to 6). A total of 695 women tested HIV positive for an overall HIV prevalence in this population of 9.6% (95% Confidence Interval = 8.9-10.2). HIV infection prevalence ranged from 5.6% (4.4-6.7) in Kagera to 6.2% (4.6-7.8) in Dodoma to 6.3% (4.8-7.9) in Kilimanjaro to 7.1% (5.4-8.8) in Mtwara to 12.8% (11.3–14.4) in Dar es Salaam to 16.0% (13.9-17.8) in Mbeya (Figure 1). HIV prevalence is also presented at the clinic level (Figure 2). Socio-demographic variables associated with ANC attendees are reported at the level of the clinic and are shown in Tables 1-6.
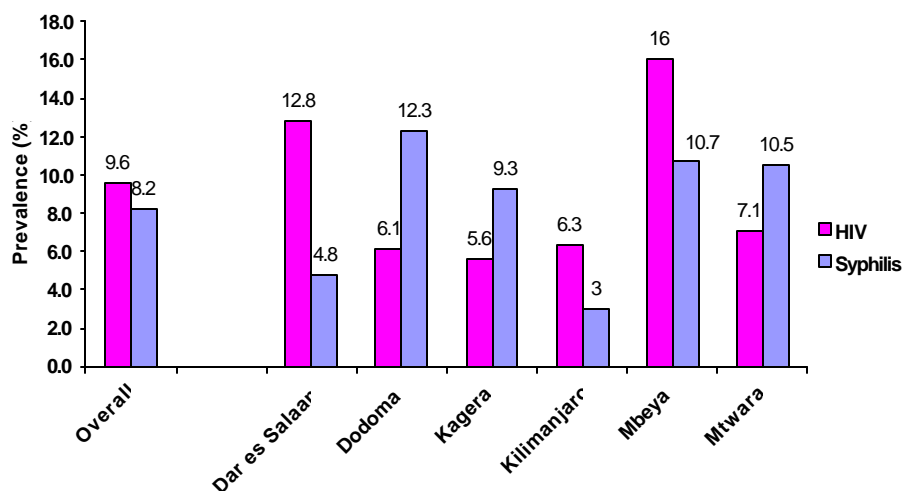
Figure 1: Prevalence of HIV and syphilis by regions among ANC attendees, Tanzania, 2001 - 2002

Of the 24 ANC sites participating in this study countrywide, 8 (33.3%) reported an HIV prevalence of 10% or more, one clinic in Mtwara (urban), 1 in Dodoma (Roadside) 2 in Mbeya (urban and border) and all 4 urban clinics in the Dar es Salaam region (fig 2). Attendees from clinics located in urban areas had higher HIV prevalence than those recruited from rural clinics (Pearson χ^2=83.7, p<0.001) (figure7)
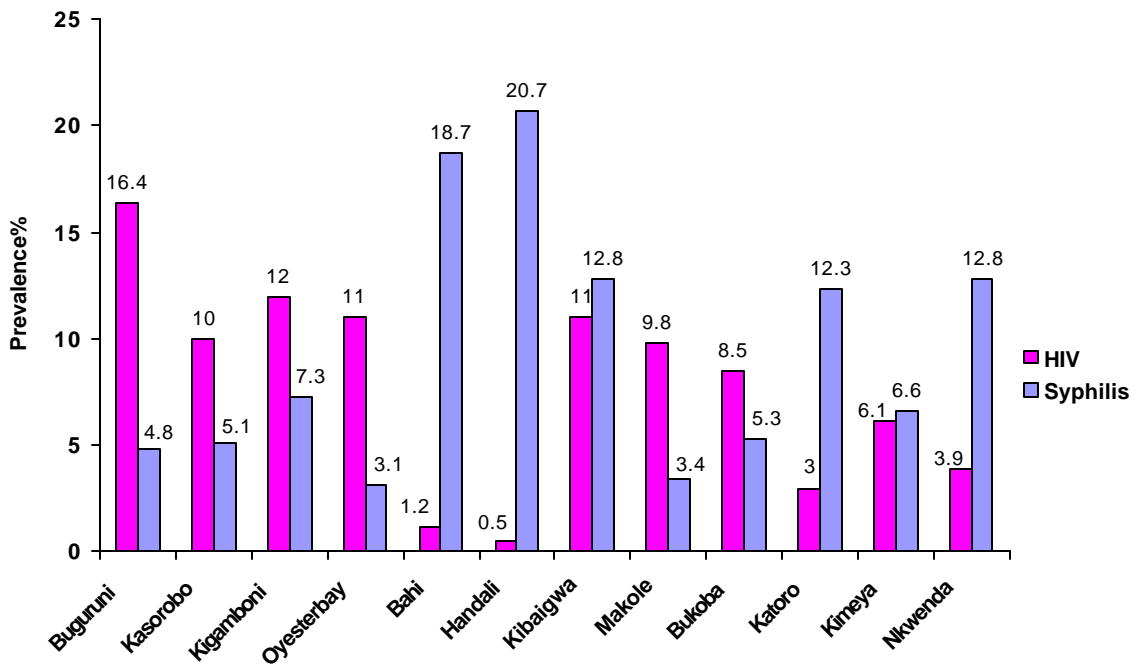
Figure 2a: Prevalence of HIV and syphilis by ANC among ANC attendees, Tanzania 2001 - 2001
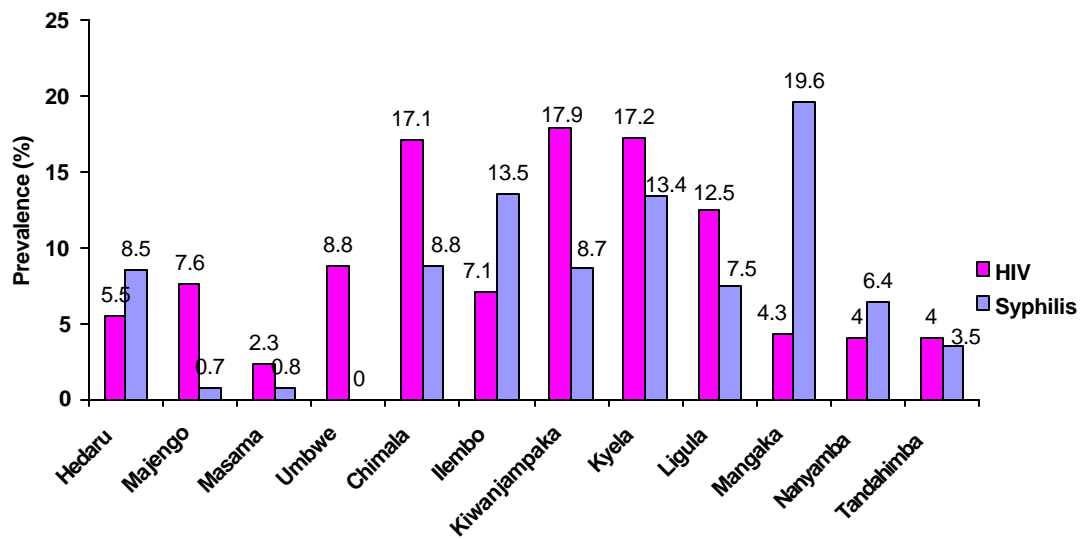
Figure 2b: Prevalence of HIV and syphilis by ANC attendees, Tanzania, 2001 - 2002

In all regions, HIV prevalence was highest among women in women aged 25 - 34. Rates were similar among the youngest and oldest age groups (Pearson χ^2=52.4, p<0.0001), Figure 3. Single women had a higher prevalence than married women (Pearson χ^2=11.5, p<0.001) (Figure 4). Prevalence among single women who had been pregnant before (18.3%) was nearly twice that of married women who had been pregnant before (9.8%) (p<0.0001). Most HIV positive attendees in this study had previous pregnancies.
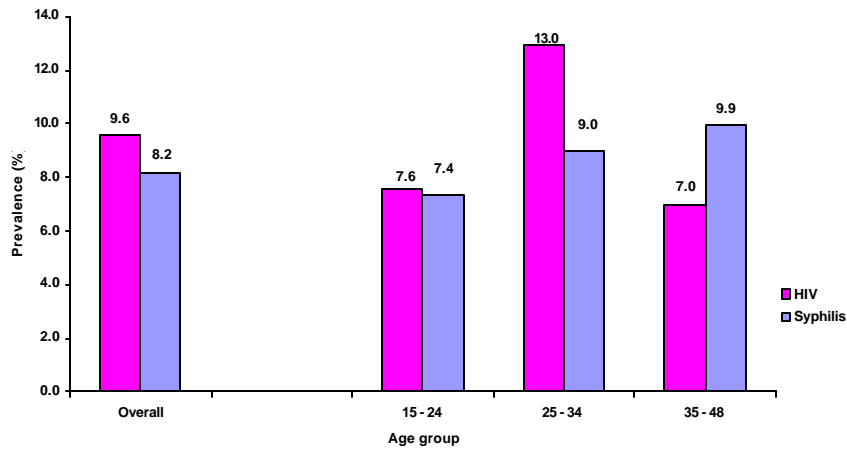
Figure 3: Prevalence of HIV and syphilis by age group among ANC attendees, Tanzania, 2001 - 2002
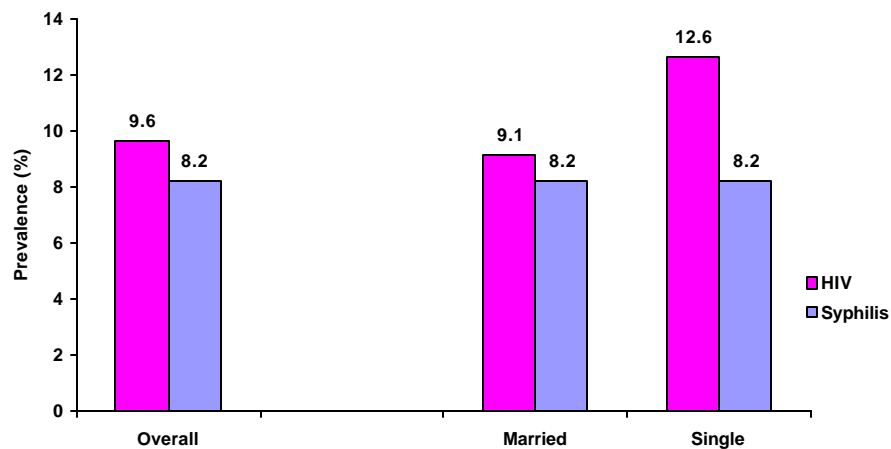
Figure 4: Prevalence of HIV and syphilis by marital status among ANC attendees, Tanzania, 2001 - 2002

Women that reported some or more primary education had higher prevalence in some regions than women with no education (Pearson χ^2=15.6, p<0.0001), Figure 5.
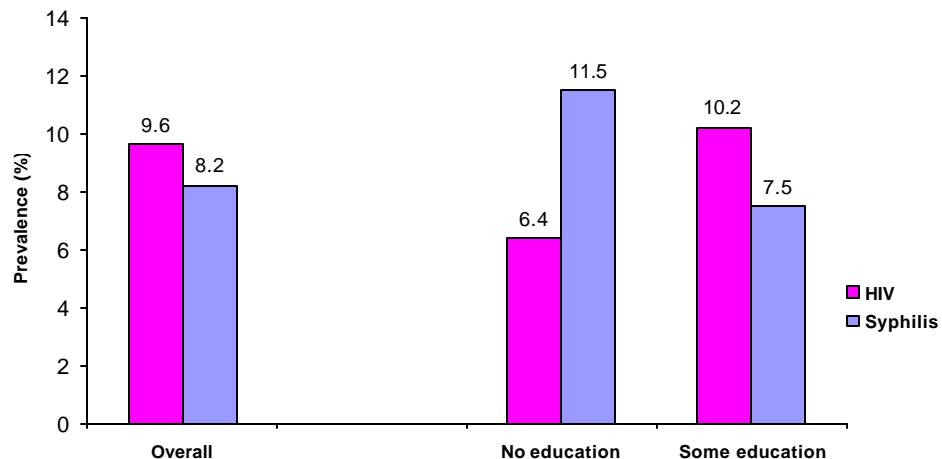
Figure 5: Prevalence of HIV and syphilis by education status among ANC attendees, Tanzania, 2001 - 2002
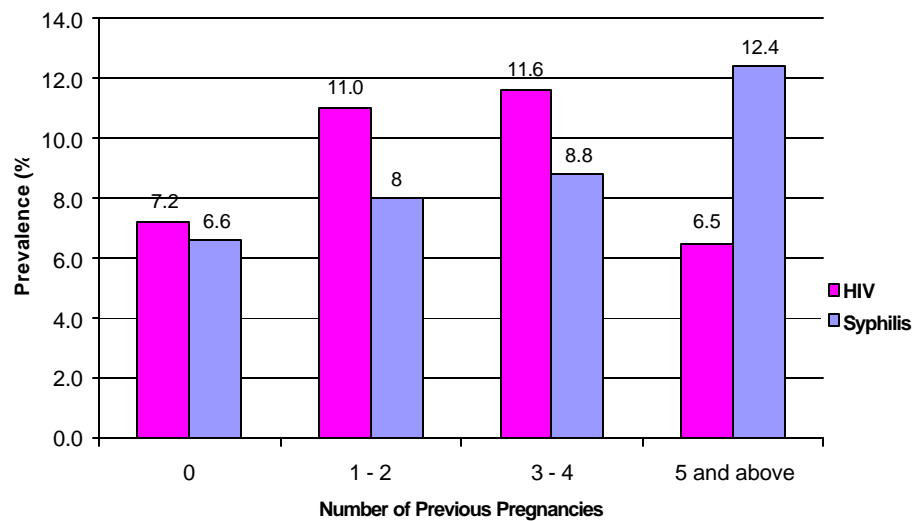
Fig 6. Prevalence of HIV and syphilis by number of previous pregnancies among ANC attendees, Tanzania, 2001 - 2002
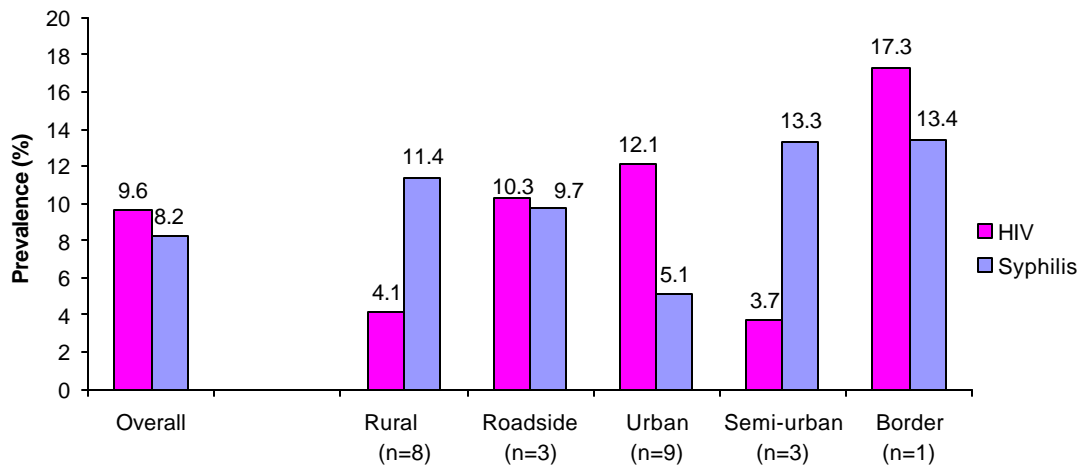
Figure 7: Prevalence of HIV and Syphilis Among ANC Attendees by ANC Type, Tanzania, 2001 - 2002

3.2 Syphilis prevalence

A total of 7,201 ANC attendees were tested for syphilis during the study period. A total of 590 women tested positive for an overall syphilis prevalence in this study population of 8.2% (95% CI = 7.6-8.8). Syphilis infection prevalence ranged from 3.0% (1.9% - 4.1) in Kilimanjaro to 4.8% (3.8%-5.9%) in Dar es Salaam to 9.3% (7.8%-10.8%) in Kagera to 10.5% (8.5-12.6) in Mtwara to 10.7% (9.1-12.4) in Mbeya to 12.3% (10.1-14.4) in Dodoma. Selected socio-demographic variables associated with syphilis infection are reported by clinic and are shown in Table 7.

Women living in rural areas had higher prevalence than those in urban areas (Pearson χ^2=68.8, p<0.0001) (Figure 6). Marital status did not appear to influence the prevalence of syphilis (Figure 4). Women aged 25-34 were more likely to have syphilis than women aged less than 25 years, (Pearson χ^2=6.0, p=0.015) (Figure 3). In contrast to women with HIV, women with no education were more likely to be infected with syphilis than were women with some education (Pearson χ^2=20.4, p<0.0001) (Figure 5).

3.3 HIV/Syphilis co-infection

Overall, 12.4% of clinic attendees were co-infected with syphilis and HIV. Of those co-infected, 89% lived in an urban area, 60% were aged 25-34, 86% were married, and 86% had some formal education. The highest proportion of co-infected attendees was observed in Mtwara, with 24.6% of HIV infected women co-infected with syphilis. In Kilimanjaro, 4.9% of HIV-infected women were co-infected with syphilis.

HIV prevalence in this surveillance system was 9.6% with a range of 5.6% to 16.0% within 6 regions of Tanzania. Previous HIV prevalence estimates in Tanzania have ranged from 4% to 32% using a variety of different methodologies. Important findings of these data include a higher HIV prevalence in women living in urban areas, reporting formal education, and among single women with previous pregnancies. Of note were the findings that over 80% of women co-infected with HIV and syphilis were married, had formal education and lived in urban areas. These findings suggest a trend toward HIV transmission in urban Tanzanian populations that are more mobile and have more education than previously thought, and suggest that prevention activities should focus on decreasing sexual transmission among these populations, and should include the sexual partners of women.

The ANC serosurveillance programme described here provides a model for systematic and reproducible data collection within Tanzania and countries striving to increase reliability of field data. The introduction of DBS technology for blood collection and the standardized approach to surveillance methods, improved the reliability and quality of data collection from the field. ANC serosurveillance in Tanzania will continue to provide yearly prevalence estimates so that trends in disease prevalence may be tracked and effectiveness of prevention programmes may be measured.

Regions and ANCs sites included in this surveillance round were selected based on previous participation in national surveillance and with consideration of existing laboratory and personnel capacity in those sites. This limitation we plan to address in subsequent rounds through use of a more systematic site selection scheme.

Plans for 2003 ANC surveillance include increasing the number of participating regions and ANC sites. In addition, HIV testing in subsequent rounds will occur at the regional level, allowing opportunities to increase regional laboratory capacity and ownership of ANC surveillance throughout the country.

TABLES

Table 1. HIV prevalence among ANC attendees, Dar es Salaam, Tanzania, 2001 – 2002

Characteristics	Buguruni No.	HIV Prevalence (%)	Kasorobo No.	HIV Prevalence (%)	Kigamboni No.	HIV Prevalence (%)	Oysterbay No.	HIV Prevalence (%)	Total No.	HIV Prevalence (%)
Age Group (yrs)										
15 - 24	333	12.0	164.0	6.70	179	6.1	279	7.9	955	8.8
25 - 34	209	23.0	97.0	15.5	125	19.2	202	15.8	633	18.8
35 - 48	26	19.2	18.0	11.1	25	20.0	20	10.0	89	5.7
Not stated	3	0.0	1.0	0.00	5	9.1	11	9.1	20	5.3
Median Age (yrs)	23		23		24		24		23	
Marital status										
Single	108	13.0	63	12.70	96	15.6	140	12.9	407	13.5
Married	458	17.2	217	9.20	224	11.2	366	10.1	1265	12.7
Other							4	25.0	4	25.0
Not stated	5	**0.0**			14	**0.0**	2	50.0	21	4.8
Previous pregnancies										
0	231	10.0	3	0.0	117	6.8	189	7.9	540	8.5
1 - 2	251	18.7	179	7.3	138	12.3	232	12.1	800	13.1
3 - 4	75	26.7	75	16.0	55	20.0	71	12.7	276	18.8
≥ 5	14	21.4	23	13.0	24	16.7	20	25.0	81	18.5
Education Level										
No formal	58	19.0	27	7.4	47	10.6	19	5.3	151	12.6
Primary	472	16.1	239	10.5	245	11.0	435	11.5	1391	12.8
$\geq$Secondary	40	15.0	14	7.1	40	20.0	58	10.3	152	13.8
Not stated	1				2				3	
Distance from residence to clinic										
0 - 5 Km	451	16.4	276.0	9.4	303	11.9	506	10.9	1536	12.4
> 5 Km	115	16.5	3.0	66.7	31	12.9	3	33.3	152	17.1
Not stated	5	**0.0**	1.0	**0.0**			3	33.3	9	11.1
Duration living in residence										
< 6 months	55	12.7	0	0	48	12.5	6	0.0	109	11.90
$\geq$6 months	514	16.5	280	10.0	284	12.0	504	11.1	1582	12.80
Not stated	12	0.0	0	0	2	0.0	2	50.0	6	33.3
Total number Tested for HIV	571		280		334		512		1697	
Total number HIV positive	93		28		40		56		218	
Overall HIV prevalence by site	**%**	16.4		10.0		12.0		11.0		12.8

Table 2. HIV prevalence among ANC attendees, Dodoma, Tanzania, 2001 – 2002

Characteristics	Bahi (Rural) No.	HIV Prevalence (%)	Handali (Rural) No.	HIV Prevalence (%)	Kibaigwa (Roadside) No.	HIV Prevalence (%)	Makole (Urban) No.	HIV Prevalence (%)	Total No.	HIV Prevalence (%)
Age Group (yrs)										
15 - 24	68	1.5	90	0.0	107	5.6	188	9.0	453	5.3
25 - 34	77	1.3	73	0.0	66	19.7	120	10.8	336	8.0
35 - 48	22	0.0	39	2.6	7	14.3	19	10.5	87	4.6
Not stated	6	0.0	2	0.0	1	0.0	3	0.0	12	0.0
Median Age (yrs)	27		26		22		23		24	
Marital status										
Single	12	8.3	16	0.0	18	5.6	61	9.8	107	7.5
Married	159	0.6	186	0.5	161	11.8	268	9.7	774	6.1
Other							1	0.0	1	0.0
Not stated	2	0.0	2	0.0	2	0.0			6	0.0
Previous pregnancies										
0	44	0.0	44	0.0	47	4.3	115	6.1	250	3.6
1 - 2	56	1.8	58	0.0	78	9.0	152	12.5	344	7.8
3 - 4	39	0.0	53	0.0	34	14.7	45	13.3	171	6.4
>5	34	2.9	49	2.0	22	27.3	18	0.0	123	6.2
Education Level										
No formal	65	0.0	103	1.0	59	5.1	30	10.0	257	2.7
Primary	105	1.9	99	0.0	116	12.9	249	9.6	569	7.2
≥Secondary	2	0.0			5	40.0	50	10.0	57	12.3
Not stated	1		2		1		1		5	
Distance from residence to clinic										
0 - 5 Km	135	1.5	201	0.5	141	12.1	107	9.3	584	5.1
> 5 Km	36	0.0	1	0.0	39	5.1	220	10.0	296	8.1
Not stated	2	0.0	2	0.0	1	0.0	3	0.0	8	12.5
Duration living in residence										
< 6 months			23	0.0	0		45	8.9	68	5.9
≥6 months	161	1.2	177	0.6	177	11.3	278	10.1	793	6.4
Not stated	12	0.0	4	0.0	4	0.0	7	0.0	27	0.0
Total number Tested for HIV	173		204		181		330		888	
Total number HIV positive	2		1		19		32		54	
Overall HIV prevalence by site	**%**	1.2		0.5		11.0		9.8		6.1

Table 3. HIV prevalence among ANC attendees, Kagera , Tanzania, 2001 – 2002

Characteristics	Bukoba (Urban) No.	HIV Prevalence (%)	Katoro (Semi-urban) No.	HIV Prevalence (%)	Kimeya (Rural) No.	HIV Prevalence (%)	Nkwenda (Rural) No.	HIV Prevalence (%)	Total No.	HIV Prevalence (%)
Age Group (yrs)										
15 - 24	310	6.5	165	1.8	74	2.7	258	3.5	807	4.2
25 - 34	193	11.4	134	5.2	84	9.5	165	4.2	576	7.6
35 - 48	10	20.0	29	0	16	0	40	5	95	4.2
Not stated	3	0	5	0	7	14.3	1	0	16	6.3
Median Age (yrs)	23		24		25		24		24	
Marital status										
Single	39	15.4	7		5	20.0	10	20.0	61	14.8
Married	470	8.1	321	3.1	176	5.7	453	3.5	1,420	5.2
Other	1						1		2	0
Not stated	6		5	0					11	0
Previous pregnancies										
0	195	6.2	23	4.3	27	0.0	104	4.8	349	5.2
1 - 2	228	10.5	136	2.2	54	3.7	162	2.5	580	5.7
3 - 4	78	10.3	92	3.3	47	12.8	106	2.8	323	6.2
$\geq$5	15	0.0	82	3.7	53	5.7	92	6.5	242	5.0
Education Level										
No formal	19	0.0	58	5.2	70	5.7	173	2.9	320	3.8
Primary	428	9.3	270	2.6	109	6.4	282	4.3	1,089	6.1
$\geq$Secondary	64	6.3	4	0.0	1	0	7	14.3	76	6.6
Not stated	5	0.0	1	0.0	1	0	2	0	9	0
Distance from residence to clinic										
0 - 5 Km	482	7.7	207	2.4	177	6.2	182	4.4	1,048	5.8
> 5 Km	26	23.1	119	4.2	2	0	280	3.6	427	4.9
Not stated	8	12.5	7	0	2	0	2	0	19	5.3
Duration living in residence										
< 6 months					1	0	1	0	2	0
$\geq$6 months	513	8.6	330	3.0	177	6.2	462	3.9	1,482	5.6
Not stated	3	0	3	0	3	0	1	0	10	0
Total number Tested for HIV	516		333		181		464		1494	
Total number HIV positive	43		10		11		18		83	
Overall HIV prevalence by site	**%**	8.5		3.0		6.1		3.9		5.6

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Table 4. HIV prevalence among ANC attendees, Kilimanjaro, Tanzania, 2001 – 2002

Characteristics	Hedaru (Roadside) No.	HIV Prevalence (%)	Majengo (Urban) No.	HIV Prevalence (%)	Masama (Rural) No.	HIV Prevalence (%)	Umbwe (Rural) No.	HIV Prevalence (%)	Total No.	HIV Prevalence (%)
Age Group (yrs)										
15 - 24	126	4.8	235	6.4	75	1.3	45	6.7	481	5.2
25 - 34	131	6.9	164	9.8	50	4	56	12.5	401	8.5
35 - 48	37	2.7	19	5.3	8	0	12	0	76	2.6
Not stated		-	6	0		-	1	0	7	
Median Age (yrs)	25		24		24		27		24	
Marital status										
Single	20	10	60	10	10	10	12	8.3	102	9.8
Married	274	5.1	364	7.1	123	1.6	102	8.8	863	5.9
Other										
Not stated										
Previous pregnancies										
0	77	6.5	149	4.7	48	0.0	26	3.8	300	4.3
1 - 2	95	3.2	203	8.9	58	3.4	43	14.0	399	7.3
3 - 4	78	7.7	57	10.5	26	3.8	31	9.7	192	8.3
≥5	44	4.5	15	6.7	1	0.0	14	0.0	74	4.1
Education Level										
No formal	16	0.0	5	20	0	0	3	0.0	24	4.2
Primary	275	5.8	359	7.5	119	2.5	107	8.4	860	6.4
≥Secondary	2	0.0	60	6.7	14	0.0	4	25	80	6.3
Not stated	1	0.0	0		0	0	0		1	
Distance from residence to clinic										
0 - 5 Km	203	4.9	361	6.9	131	2.3	108	8.3	803	5.9
> 5 Km	90	6.7	63	11.1	1		6	16.7	160	8.7
Not stated	1	0			1				2	
Duration living in residence										
< 6 months	1	100	97	7.2	6	16.7	3	0.0	107	8.4
≥6 months	293	5.1	325	7.4	127	1.6	111	9.0	856	6.0
Not stated			2	50.0					2	50.0
Total number Tested for HIV	294		424		133		114		965	
Total number HIV positive	16		32		3		10		61	
Overall HIV prevalence by site	**%**	5.5		7.6		2.3		8.8		6.3

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Table 5. HIV prevalence among ANC attendees, Mbeya, Tanzania, 2001 – 2002

Characteristics	Chimala (Roadside) No.	HIV Prevalence (%)	Ilembo (Rural) No.	HIV Prevalence (%)	Kiwanjampaka (Urban) No.	HIV Prevalence (%)	Kyela (Border) No.	HIV Prevalence (%)	Total No.	HIV Prevalence (%)
Age Group (yrs)										
15 - 24	122	15.6	103	5.9	335	13.1	239	16	799	13.4
25 - 34	74	23	93	7.5	199	24.6	113	22.1	479	20.5
35 - 48	16	6.3	12	8.3	25	24	17	5.9	70	12.9
Not stated	5	0	3	-	9	25	4	-	21	11.1
Median Age (yrs)	23		25		23		22		23	
Marital status										
Single	18	0.0	10	20.0	71	15.5	53	18.9	152	15.1
Married	197	18.3	197	6.6	496	18.1	308	16.6	1,198	15.9
Other					1	0	8	37.5	9	33.3
Not stated	2	50.0	4	0.0			4	0	10	10.0
Previous pregnancies										
0	66	13.6	64	4.7	216	12.5	132	12.9	478	11.7
1 - 2	87	20.7	69	11.6	233	20.6	180	21.7	569	19.9
3 - 4	45	20.0	50	8.0	100	24.0	55	12.7	250	17.6
≥ 5	19	5.3	28	0.0	19	10.5	6	16.7	72	5.6
Education Level										
No formal	30	30.0	40	7.5	58	13.8	8	25.0	136	16.2
Primary	173	15.6	164	7.3	449	18.0	335	17.9	1,121	16.1
$\geq$Secondary	13	0.0	6	0.0	61	19.7	30	6.7	110	12.7
Not stated	1	100.0	1	0.0					2	50.0
Distance from residence to clinic										
0 - 5 Km	113	16.8	125	6.4	404	17.8	358	17.6	1,000	16.2
> 5 Km	102	16.7	78	9.0	150	18.0	12	8.3	342	15.2
Not stated	2	50.0	8	0.0	14	14.3	3	0.0	27	11.1
Duration living in residence										
< 6 months	10	20.0	5	0.0	64	15.6	2	0.0	81	14.8
$\geq$6 months	207	16.9	200	7.0	503	18.1	370	17.3	1,280	15.9
Not stated			6	16.7	1	0.0	1	0.0	8	12.5
Total number Tested for HIV	217		211		568		373		1,369	
Total number HIV positive	37		15		102		64		218	
Overall HIV prevalence by site	**%**	17.1		7.1		17.9		17.2		16.0

Table 6. HIV prevalence among ANC attendees, Mtwara, Tanzania, 2001 – 2002

Characteristics	Ligula (Urban) No.	HIV Prevalence (%)	Mangaka (Semi-urban) No.	HIV Prevalence (%)	Nanyamba (Rural) No.	HIV Prevalence (%)	Tandahimba (Semi-urban) No.	HIV Prevalence (%)	Total No.	HIV Prevalence (%)
Age Group (yrs)										
15 - 24	158	7.0	133	6.0	66	1.5	67	3.0	424	5.2
25 - 34	117	19.7	97	4.1	46	8.7	72	5.6	332	10.5
35 - 48	28	10.7	46	0.0	12	0.0	13	0.0	99	3.0
Not stated	2	100	3	0.0	1	0	1	0.0	7	20
Median Age (yrs)	24		25		24		25		25	
Marital status										
Single	58	13.8	35	14.3	25	8.0	8	0.0	126	11.9
Married	247	12.1	243	2.9	144	4.2	144	4.2	733	6.3
Other										
Not stated			1	0.0	1	0.0	1	0.0	3	0.0
Previous pregnancies										
0	112	6.3	76	5.3	9	11.1	43	4.7	240	5.8
1 - 2	124	13.7	93	6.5	67	3.0	64	3.1	348	7.8
3 - 4	54	22.2	54	3.7	32	3.1	30	6.7	170	10.0
≥5	15	13.3	56	0.0	17	5.9	16	0.0	104	2.9
Education Level										
No formal	57	8.8	91	4.4	47	2.1	68	4.4	263	4.9
Primary	216	13.4	181	3.9	73	5.5	75	4.0	545	7.9
≥Secondary	32	12.5	7	14.3	5	0.0	8	0.0	52	9.6
Not stated							2	0.0	2	0.0
Distance from residence to clinic										
0 - 5 Km	290	12.8	124	7.3	97	5.2	128	4.7	639	8.9
> 5 Km	14	7.1	154	1.9	27	0.0	23	0.0	218	1.8
Not stated	1	0.0	1	0.0	1	0.0	2	0.0	5	0.0
Duration living in residence										
< 6 months	56	8.9			11	9.1	3	0.0	70	8.6
≥6 months	248	13.3	277	4.3	112	3.6	149	4.0	786	7.0
Not stated	1	0.0	2	0.0	2	0.0	1	0.0	6	0.0
Total number Tested for HIV	305		279		125		153		862	
Total number HIV positive	38		12		5		6		61	
Overall HIV prevalence by site	**%**	12.5		4.3		4.0		4.0		7.1

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Table 7: Region and site specific prevalence of syphilis by age, level of education and HIV serostatus, 2001 - 2002

	Age 15 - 24		25 - 34		35 - 48		HIV Serostatus Negative		Positive		Level of Education No formal education		Primary		Secondary and above		Total	
	Number	Syphilis Prevalence (%)	Number	Syphilis Prevalence (%)	Number	Syphilis Prevalence (%)	Number	Syphilis Prevalence (%)	Number	Syphilis Prevalence (%)	Number	Syphilis Prevalence (%)	Number	Syphilis Prevalence (%)	Number	Syphilis Prevalence (%)	Number	Syphilis Prevalence (%)
Dar es Salaam																		
Buguruni	328	3.4	208	7.2	26	3.8	474	3.8	91	9.9	58	6.9	466	4.9	40	0.0	565	4.8
Kasorobo	159	4.4	95	4.2	18	16.7	245	5.7	28	0.0	26	0.0	233	4.7	14	21.4	273	5.1
Kigamboni	177	6.2	124	8.1	25	12.0	288	6.9	40	10.0	44	6.8	244	7.8	40	5.0	330	7.3
Oyesterbay	278	3.2	202	3.5	20	0.0	453	2.6	57	7.0	19	10.5	433	2.8	59	3.4	511	3.1
Total	*942*	*4.0*	*629*	*5.7*	*89*	*7.9*	*1460*	*4.4*	*216*	*7.9*	*147*	*6.1*	*1,376*	*4.7*	*153*	*4.6*	*1,679*	*4.8*
Dodoma																		
Bahi	68	10.3	75	24.0	22	13.6	169	18.3	2	50.0	65	16.9	103	20.4	2	0.0	171	18.7
Handali	90	18.9	73	26.0	38	15.8	202	20.3	1	100.0	102	19.6	99	21.2			203	20.7
Kibaigwa	107	12.1	65	15.4	7	0.0	160	11.2	20	25.0	58	12.1	116	12.9	5	20.0	180	12.8
Makole	187	2.1	117	4.3	19	10.5	294	3.1	32	6.3	30	10.0	247	2.8	48	0.0	326	3.4
Total	*452*	*9.1*	*330*	*15.8*	*86*	*12.8*	*825*	*12.0*	*55*	*16.4*	*255*	*16.1*	*565*	*11.3*	*55*	*1.8*	*880*	*12.3*
Kagera																		
Bukoba	308	4.5	192	6.3	10	10.0	469	4.7	44	11.4	19	5.3	425	5.9	64	1.6	513	5.3
Katoro	164	9.1	134	15.7	29	13.8	322	12.1	10	20.0	57	14.0	270	11.5	4	50.0	332	12.3
Kimeya	74	9.5	84	3.6	16	12.5	170	7.1	11	0.0	70	7.1	109	6.4	1	0.0	181	6.6
Nkwenda	251	12.7	162	14.2	40	7.5	436	13.1	18	5.6	169	16.6	276	10.9	7	0.0	454	12.8
Total	*797*	*8.5*	*572*	*10.3*	*95*	*10.5*	*1,397*	*9.3*	*83*	*9.6*	*315*	*13.3*	*1080*	*8.6*	*76*	*3.9*	*1480*	*9.3*
Kilimanjaro																		
Hedaru		6.3	131	10.7	37	8.1	277	8.3	16	12.5	16	6.3	275	8.7	2	0.0	294	8.5
Majengo	235	0.9	164	0.6	19	0.0	392	0.5	32	3.1	5	0.0	359	0.8	60	0.0	424	0.7
Masama	75	1.3	50	0.0	8	0.0	130	0.8	3	0.0			119	0.8	14	0.0	133	0.8
Umbwe	45	0.0	55	0.0	12	0.0	103	0.0	10	0.0	3	0.0	106	0.0	4	0.0	113	0.0
Total	*481*	*2.3*	*400*	*3.8*	*76*	*3.9*	*902*	*2.9*	*61*	*4.9*	*24*	*4.2*	*859*	*3.3*	*80*	*0.0*	*964*	*3.0*
Mbeya																		
Chimala	122	7.4	74	12.2	16	6.3	180	5.6	37	24.3	30	6.7	173	9.8	13	0.0	217	8.8
Ilembo	98	15.3	87	12.6	12	8.3	185	13.5	15	13.3	39	7.7	155	14.2	5	40.0	200	13.5
Kiwanjampaka	331	8.2	199	10.1	25	8.0	462	8.0	101	11.9	57	8.8	446	9.6	61	1.6	564	8.7
Kyela	240	15.4	112	9.8	17	0.0	308	12.7	64	17.2	8	37.5	335	12.8	30	13.3	373	13.4
Total	*791*	*11.1*	*472*	*10.8*	*70*	*5.7*	*1,135*	*9.8*	*217*	*15.7*	*134*	*9.7*	*1,109*	*11.3*	*109*	*6.4*	*1,354*	*10.7*
Mtwara																		
Ligula	158	5.1	118	10.2	28	7.1	267	4.9	38	7.5	58	6.9	216	7.9	32	6.3	306	7.5
Mangaka	130	16.9	93	19.4	45	28.9	259	18.9	12	19.6	91	16.5	173	22.0	7	0.0	271	19.6
Nanyamba	66	6.1	462	6.5	12	8.3	120	5.8	5	6.4	47	4.3	73	8.2	5	0.0	125	6.4
Tandahimba	63	7.9	67	0.0	12	0.0	136	3.7	6	3.5	62	6.5	71	0.0	8	12.5	142	3.5
Total	*417*	*9.4*	*324*	*10.2*	*97*	*16.5*	*782*	*9.5*	*61*	*24.6*	*258*	*9.7*	*533*	*11.4*	*52*	*5.8*	*844*	*10.5*
All																		
Total enrollees	3,880		2,727		513		6,501		693		1,133		5,522		525		7,201	
Total RPR +	285		246		51		504		86		131		436		21		590	
Syphilis Prevalence %		7.4		9.0		9.9		7.8		12.4		11.6		7.9		4.0		8.2

ANNEXES

Annex 1: **Geographic zones, regions and ANC sero-surveillance, Tanzania, 2001-2002.**

Geographic Zone	Regions	Surveillance Regions
Coastal zone	Tanga, Mororgoro, Coast, and Dar es Salaam.	Dar es Salaam
Northern Highland zone	Arusha, Kilimanjaro	Kilimanjaro
Lake Zone	Tabora, Kigoma, Shinyanga, Kagera, Mwanza and Mara	Kagera
Central Zone	Dodoma and Singida	Dodoma
Southern Highland Zone	Iringa, Mbeya and Rukwa	Mbeya
Southern Zone	Lindi, Mtwara and Ruvuma	Mtwara

Annex 2: **ANC sites by region, type and location/district, ANC sero-surveillance, Tanzania, 2001-2002.**

Region	Name of MCH Clinic	Type	Location/District
Kilimanjaro	Majengo Health Centre	Urban	Moshi Municipality
	Umbwe Health Centre	Rural	Moshi Rural District
	Masama (Modio) Health Centre	Rural	Hai District
	Hedaru dispensary	Roadside	Same District
Dodoma	Makole Urban Health Centre	Urban	Dodoma Municipality
	Bahi Government Dispensary	Rural	Dodoma Rural District
	Handali Rural Health Centre	Rural	Dodoma Rural District
	Kibaigwa Dispensary	Roadside	Kongwa District
Kagera	Bukoba Regional Hospital	Urban	Bukoba Township
	Katoro Health Centre	Semi-urban	Bukoba Rural District
	Kimeya Health Centre	Rural	Muleba District
	Nkwenda Health Centre	Rural	Karagwe
Mtwara	Ligula Hospital	Urban	Mtwara Township
	Nanyamba Health Centre	Rural	Mtwara rural District
	Tandahimba Health Centre	Semi-urban	Tandahimba District
	Mangaka Dispensary	Semi-urban	Masasi District
Mbeya	Kiwanjampaka Health Centre	Urban site	Mbeya Urban District
	Chimala Mission Hospital	Roadside	Mbarali District
	Ilembo Rural Health Centre	Rural	Mbeya Rural District
	Kyela District Hospital	Border	Kyela District
Dar es Salaam	Kigamboni Health Centre	Urban	Temeke District
	Kasorobo MCH Clinic	Urban	Temeke District
	Buguruni Dispensary	Urban	Ilala District
	Oysterbay MCH Clinic	Urban	Kinondoni district

Annex 3: **Data collection form for ANC sero-surveillance, Tanzania.**
Clinic card number _____

(Remove this part after assigning surveillance number)
 X---
MINISTRY OF HEALTH TANZANIA
ANC SURVEILLANCE

DATA COLLECTION FORM

1. Surveillance number _____

2. Date of specimen collection (dd/mm/yy) _____

3. Clinic Name _____   District:
_____

4. Age of the woman (years) _____

5. Marital status (circle)
                    1. Single
                    2. Married
                    3.   Other,
specify_____

6. Number of previous pregnancies: _____

7. Education status of the woman (circle)

                    1. No formal education
                    2. Adult education
                         3. Primary
                    4. Secondary
                    5. Post secondary (e.g. collage, university)

8. Estimate distance in Kilometres from the woman's residence to the Clinic (circle)

                    1. 0 to 5Km
                    2. More than 5 km

9. How long have you lived in that area of your residence? (years) _____

LABORATORY TEST RESULTS
L1. RPR (circle)   1. Positive   2. Negative

L2. First Serology (circle)   1. Positive   2. Negative

L3. Second Serology (circle) 1. Positive   2. Negative

L4. Final serology result (circle) 1. Positive   2. Negative