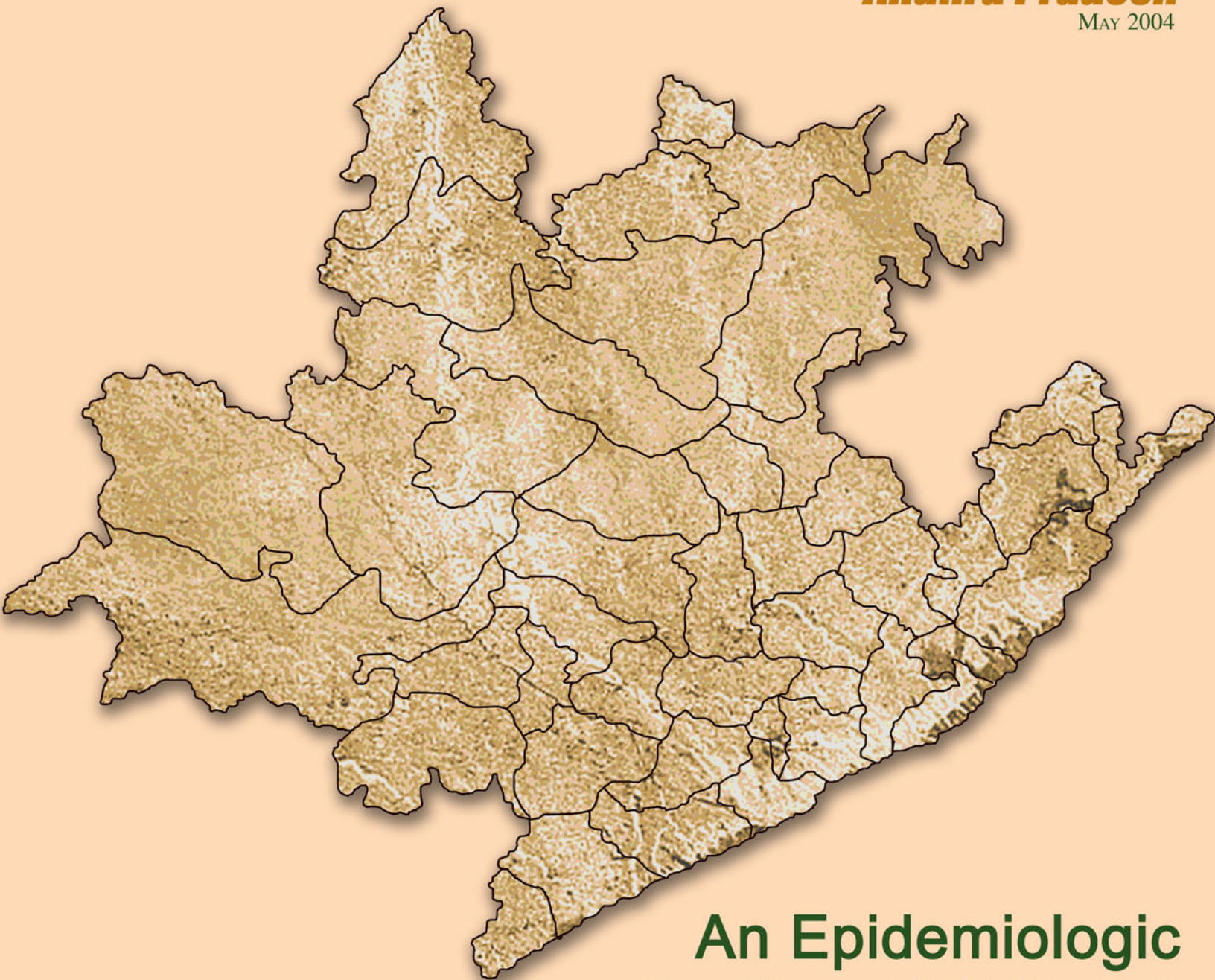


DISTRICT OF

Visakhapatnam

Andhra Pradesh

MAY 2004



An Epidemiologic Profile of HIV/AIDS

In collaboration with:
Andhra Pradesh State AIDS Control Society
Centers for Disease Control and Prevention - Global AIDS Program

AN EPIDEMIOLOGIC PROFILE OF HIV AND AIDS

VISAKHAPATNAM DISTRICT, ANDHRA PRADESH

A Collaborative Effort by:

AP SACS, CDC-GAP INDIA, & NASTAD

MAY 2004

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 - Microbiology Department
 - OB/GYN Department
- ❖ District Leprosy Office (DLO), Visakhapatnam
- ❖ Narsipatnam Area Hospital
- ❖ Anakapalle Area Hospital
- ❖ King George Hospital Blood Bank
- ❖ Green Vision
- ❖ CHEST Hospital (Tuberculosis)
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EXECUTIVE SUMMARY

In order to understand the magnitude and characteristics of the HIV/AIDS epidemic in Visakhapatnam District, the Andhra Pradesh AIDS Control Society (AP SACS), in collaboration with the United States National Alliance for State and Territorial AIDS Directors (NASTAD) and the United States Centers for Disease Control and Prevention – Global AIDS Program (CDC-GAP), developed an HIV/AIDS epidemiologic profile. Data collected between April 2002 and March 2003 were examined from a variety of government-funded venues. While these data describe only persons seeking care in publicly funded settings and do not represent all persons living with HIV/AIDS in the district, they do provide useful information about the impact of HIV on both the general population as well as those in populations considered to be at high risk for HIV infection.

HIV in the general population

Data were collected from locations where people received health care services unrelated to HIV and were, as a part of receiving these services, tested for HIV infection. Individuals tested for HIV in these venues are often considered to be more representative of the general population than populations that are specifically seeking HIV-related services. One such population includes pregnant women. Data were collected from women attending antenatal clinics (ANC) and Prevention of Parent-to-Child Transmission (PPTCT) clinics at two urban sites in Visakhapatnam, King George Hospital and Victoria General Hospital, and from two rural hospitals, Anakapalle and Aganampudi Area Hospitals.

The proportion of individuals testing HIV positive between April 2002 and March 2003, varied among the three PPTCT sites. HIV seropositivity at King George Hospital was 2.1% (61 of 2,898), while at Victoria General Hospital it was 1.0% (31 of 3,196) and at Anakapalle Hospital it was 1.9% (7 of 369). In addition to PPTCT data, 2003 ANC sentinel surveillance data were examined from Anakapalle and Aganampudi Area Hospitals with HIV prevalence of 1.0% (4 of 400) and 2.25% (9 of 400) respectively. In order to understand the risk profile of women who tested positive for HIV in these settings, information collected about risk behavior and reason for visit was examined. Behavioral data were generally sparse with the exception of data collected from the KGH PPTCT. Thirty-four percent (21 of 61) of HIV positive women at KGH reported that their husbands had multiple sex partners while an additional thirteen percent (8 of 61) indicated that their husbands had had extramarital exposure.

Data from the King George Hospital blood bank were examined to describe HIV in the general population; since most blood bank attendees are men, data are most representative of the male population. Seroprevalence in those accepted as blood donors was 1.9%, or 97 of 5,139 donors. Those who tested HIV positive at the blood banks were primarily male (93%), and behavioral risk information was not available for these individuals.

According to 2001 statewide behavioral surveillance data, the general population of Andhra Pradesh have a relatively high level of awareness and HIV-related knowledge compared to neighboring states and the nation as a whole. However, these high levels of knowledge did not necessarily translate into safer sexual behavior. Nineteen percent of men and 7% of women surveyed reported having non-regular sex partners and less than half (48%) of adults surveyed reported using a condom during their last sexual encounter with a non-regular partner.

HIV in risk populations

In addition to examining data considered to be more representative of the general population, data from health care settings where people were seeking or receiving services specifically related to HIV or other sexually transmitted diseases were examined. As expected, HIV seropositivity rates were higher in these populations than in the general population.

Data from one urban and two rural voluntary counseling and testing centers (VCTC) were collected. Seropositivity at the urban Andhra Medical College VCTC, was significantly higher at 29% (1,098 of 3,791) than the other two sites ($p < .000$). Seropositivity rates for the two rural VCTCs were similar; 11% (108 of 1,006) at Anakapalle Area Hospital and 10% (66 of 691) at Narsipatnam Area Hospital. In an effort to understand the risk profiles of clinic attendees, risk behavior and reason for visit were analyzed for those who tested HIV-positive at Andhra Medical College, where the data were most robust. Fifty-four percent of males (338 of 630) listed prolonged illness as their reason for visit, and 95% (598 of 630) listed multiple heterosexual partners as their risk behavior. In comparison, 48% (191 of 396) of female clients cited their spouse's HIV infection as the reason for their visit.

Aggregate AIDS case data from 140 individuals were examined. For these cases, the predominant route of HIV infection was sexual transmission (86%). Females comprised 41% of cases and tended to be younger than male cases; 57% were between the ages of 20 and 29 compared to 37% of males.

Individual-level data were collected from the AMC Sexually Transmitted Disease Clinic. Sentinel surveillance STD data from the same facility were also examined. From 1998-2002, a higher proportion of patients at the Visakhapatnam STD sentinel surveillance site were HIV positive than at all Andhra Pradesh sites combined. HIV seropositivity from 2003 sentinel surveillance was 29.6% (74 of 250). Nearly half of the population tested was female (48.6%), and of those women who were tested, 32.4% were positive for HIV. This compares with 27.3% HIV seropositivity of male clients. In both the survey population and the clinic population, herpes and genital ulcers were commonly diagnosed. These are of special concern given the association of ulcerative STDs and HIV infection.

As with the general population, 2001 statewide behavioral surveillance data collected from risk populations (commercial sex workers and their clients) in Andhra Pradesh

indicated a high level of HIV awareness and knowledge. However, the majority of sex workers felt that they were at low risk for HIV infection. They were also more likely to report barriers to condom access and less likely to feel the need to use condoms in comparison to those interviewed in other states and the nation as a whole. Most sex workers reported that resistance was the reason for not using a condom with their last paying client.

INTRODUCTION

BACKGROUND

The Andhra Pradesh State AIDS Control Society (AP SACS), in collaboration with the United States National Alliance for State and Territorial AIDS Directors (NASTAD) and the United States Centers for Disease Control and Prevention-Global AIDS Program (CDC-GAP), developed an HIV/AIDS epidemiologic profile for Visakhapatnam District. This profile was developed as a pilot project to assess the usefulness of analyzing and presenting the available HIV/AIDS data to help guide prevention interventions. This project also provided one basis for evaluating the benefits and costs of preparing epidemiologic profiles in other districts in Andhra Pradesh.

What is an HIV/AIDS epidemiologic profile?

An HIV/AIDS epidemiologic profile is a document that describes the HIV/AIDS epidemic by identifying characteristics of defined populations infected with HIV and those not infected with HIV in a geographic area, as well as indicators of HIV infection risk. An epidemiologic profile is created using existing data to describe the sociodemographic, geographic, behavioral, and clinical characteristics of populations.

Why develop an epidemiologic profile?

The data and analyses in an epidemiologic profile can provide an objective basis for identifying the characteristics of specific populations at greatest risk of HIV infection. HIV-related data from multiple sources are drawn together and presented in one document. This information can assist decision makers in setting priorities among HIV prevention and care needs in order to target scarce resources in the most effective manner. The profile may also serve as a useful tool in monitoring the HIV/AIDS epidemic and potentially, over time, the effects of interventions implemented to control it.

The profile can also be used as a tool to better inform policy makers, health providers, program staff and the general public about the nature and extent of the epidemic, increasing community awareness and providing evidence to mobilize local resources. The data and analyses may also be useful in justifying requests for additional resources.

An epidemiologic profile serves as a starting point in responding to the epidemic. In addition to the data and analyses included in the profile, knowledge of HIV prevention activities and their effectiveness, an understanding of the various communities, and knowledge of local values and beliefs are needed in formulating policy decisions and action plans.

This epidemiologic profile brings together data to address the following questions:

1. What are the sociodemographic characteristics of the general population of Visakhapatnam?
2. What is the scope of the HIV/AIDS epidemic in Visakhapatnam, including sociodemographic characteristics of those infected with HIV?
3. What are the indicators of HIV/AIDS infection risk in Visakhapatnam?

The process of completing the Visakhapatnam epidemiologic profile provided insight into the kinds of data available, the ease with which they could be compiled and analyzed, the comparability of data across sites, and the completeness of the various data elements by source. It also provided insight into currently unavailable data that would be useful in addressing important questions about how to prevent and contain HIV. The data compiled in this profile provide a baseline against which future data may be compared.

PROFILE DATA SOURCES

Data were primarily drawn from a number of government-funded sources, as well as from one non-governmental organization (NGO) for the 2002 fiscal year, April 2002 through March 2003. Only existing data were used, however the ease of compilation and analysis varied by site. The most important apparent strengths and limitations of each data set are described in the sections where the data are presented and discussed. Additional details on each of the data sources and the individual variables collected are presented in **Appendix A**.

Data Sources:

General Population Data

- 2001 Indian Census

AIDS Case Report Data

- King George Hospital
- CHEST Hospital (tuberculosis)

Blood Bank Data

- King George Hospital Blood Bank

Voluntary Counseling and Testing Center (VCTC) Data

- Andhra Medical College, Microbiology Department
- Anakapalle Area Hospital
- Narsipatnam Area Hospital

Prevention of Parent to Child Transmission (PPTCT) Data

- King George Hospital
- Victoria General Hospital
- Anakapalle Area Hospital

Care and Support Data

- Green Vision, a non-governmental organization

2003 Sentinel Surveillance Data

- STD Data from Andhra Medical College, STD and AIDS Department
- Female Sex Worker Data collected by NGO
- Antenatal Clinic Data from Anakapalle Area Hospital
- Antenatal Clinic Data from Aganampudi Area Hospital

Sexually Transmitted Disease (STD) Clinic Data

- Andhra Medical College, STD and AIDS Department

Behavioral Surveillance System (BSS) Data

- General Population BSS
- Targeted High Risk Population BSS

DATA LIMITATIONS

It is important to consider the overall strengths and limitations of the data in this document before taking action based on the analysis. One of the greatest strengths of this epidemiologic profile is the ability to use the document to look at the impact of HIV/AIDS on Visakhapatnam District in a more comprehensive manner. The profile draws from a number of data sources that describe those who are infected with or at risk for HIV.

Certain aspects of these data limit the extent to which the profile's conclusions can be generalized to larger populations. The data were drawn, with the exception of the data from Green Vision, exclusively from government-funded facilities and cannot be considered representative of persons using privately funded services or those not seeking any services. Much of the data was compiled for only one fiscal year (April 1, 2002 through March 31, 2003). In some instances, the newness of the service (e.g. Anakapalle Area Hospital PPTCT center) meant data were available for a relatively short time frame. Additional information could be obtained from analyzing data over a longer time period. Statewide Sentinel Surveillance data (1998 to 2003) provide some information on trends over time.

Multiple records on one individual (e.g. duplicate records) could not be excluded if they occurred in more than one site.

PROFILE PREPARATION METHODS

The Visakhapatnam HIV/AIDS Epidemiologic Profile was prepared as part of a collaborative project with the Andhra Pradesh State AIDS Control Society (AP SACS), the United States Centers for Disease Control and Prevention – Global AIDS Program (CDC-GAP), and the United States National Alliance of State and Territorial AIDS Directors (NASTAD).

The majority of individual-level data were collected from various departments at the Andhra Medical College (AMC) and four government hospitals in Visakhapatnam. AP SACS provided the 2001 Indian Census data on CD-ROM. The 2003 Sentinel Surveillance data (antenatal clinic, sexually transmitted disease clinic, and female sex worker data) and Behavioral Surveillance System data were available in aggregate format from AP SACS.

AP SACS and NASTAD staff initially examined the data collection forms being used in the different settings and selected indicators from each form to consider for inclusion in the epidemiologic profile. The lists of indicators were then reviewed with representatives from each site (e.g. the department head, chief medical officer, counselor, and/or medical social worker) for appropriateness as well as completeness and relevance, and the lists were subsequently modified as needed. Representatives for each data source were also asked questions pertaining to data quality, including information on gaps in data collection and any changes in data collection forms or procedures. **Appendix A** provides site-specific information on data strengths and limitations and **Appendix B** provides the list of data quality questions asked at each site.

Individual-level data were collected from records in each of the various sites by a 4-person data abstraction team, which included two house surgeons from the AMC Community Medicine Department, and representatives from AP SACS and NASTAD. In most settings where data were collected, information for each individual client was recorded in multiple registers to protect client confidentiality. In a limited number of settings (AMC STD clinic, hospitals collecting information on AIDS cases), data on each individual client were located in one comprehensive record (e.g. the STD card, the hospital chart).

Data were abstracted from each of the sites based on the final lists of indicators. Some indicators, such as demographic characteristics, were common to all data sources, while other indicators were unique to certain data sources. Records were reviewed by hand and manually entered into registers over a one-month period. In some cases, counselors and medical social workers assisted with data collection.

Not all records were selected for abstraction due to limited time and resources. Among blood bank donors, only data from those individuals who were initially accepted as potential donors based on prescreening and who then subsequently tested HIV positive were abstracted. Due to a large volume of records in the one STD clinic site, data were

collected from only one-third of STD patient records. Within the STD clinic, data were stored separately for male and female STD patients. An attempt to sample every third record was made; however, sampling was not uniform for records on males. At times, every second record was sampled, particularly when the record belonged to an HIV positive individual; consequently, men who were infected with HIV were over-sampled. For PPTCT and VCTC records, all HIV positive cases and a sample of HIV negative cases were abstracted for the 2002 fiscal year (April 2002 – March 2003). Not all HIV negative individuals were included since only a systematic sampling of records was required to describe this population. Limited resources also precluded collecting information from all of the HIV negative records. The sample drawn of HIV negative patients was calculated as ten percent of the total number of individuals tested per month. For example, if 100 individuals were tested for HIV in a given month, then information for the *first* ten HIV negative records was collected.

Computerized databases were developed for each data source using EpiInfo 2002 software. Two individuals from the data abstraction team entered data from the registers into the EpiInfo databases. The majority of data entry occurred at the AP SACS office in Hyderabad over a three-week period. Data were subsequently cleaned and analyzed for presentation in the epidemiologic profile. Cleaning the data primarily involved organizing and recoding the collected indicators and/or creating new variables. For instance, individual occupations were combined into general occupational categories.

Data analysis was completed using EpiInfo 2002. Yates corrected Chi-squares was used for significance testing and related p-values reported. AP SACS, CDC-GAP, and NASTAD primarily provided guidance and feedback on analytic output and narrative text.

ORGANIZATION OF THE PROFILE

The epidemiologic profile is divided into two main sections:

Section 1: Core Epidemiologic Questions & Findings

This section of the profile describes the characteristics of Visakhapatnam's general population, of those infected with HIV/AIDS, and those at risk for infection. The section is organized around three questions:

- 1. What are the sociodemographic characteristics of the general population in Visakhapatnam District?**

Visakhapatnam District is described using the Indian 2001 Census data.

- 2. What is the scope of the HIV/AIDS epidemic in Visakhapatnam District?**

Based on the available data, the epidemiologic profile describes the HIV/AIDS-infected population by sociodemographic indicators including sex, age, education, occupation, and geographic location (e.g. district and mandal), as well as mode of infection and risk behaviors.

3. What are the indicators of HIV/AIDS infection risk in Visakhapatnam District?

The profile describes characteristics of individuals who may be at-risk for HIV infection, such as STD clinic patients, using available sociodemographic indicators and clinical information.

Section 2: Conclusions and Suggestions

This section of the profile describes what conclusions may be drawn from the data and associated analyses in the epidemiologic profile. Additionally, the section provides suggestions for improving data quality including, resolving areas with incomplete data and filling in information gaps.

SECTION 1: CORE EPIDEMIOLOGIC QUESTIONS & FINDINGS

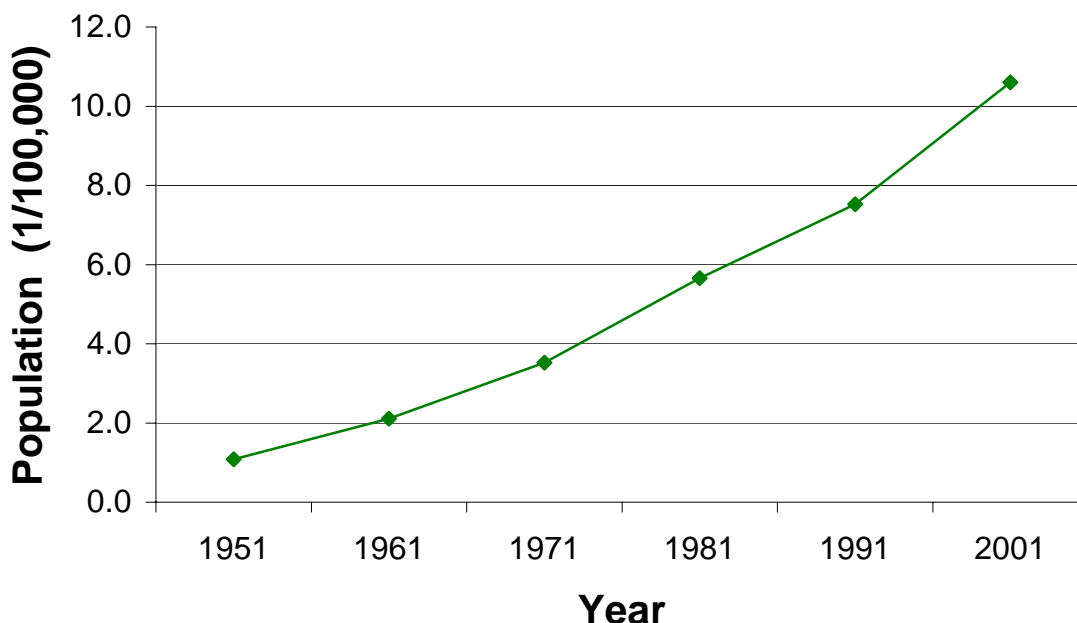
QUESTION 1. What are the sociodemographic characteristics of the general population in Visakhapatnam District?

Visakhapatnam is the fifth largest district in the State of Andhra Pradesh in South India in terms of population size. The district covers an area of 11,169 square kilometers and is composed of 42 mandals, 4,623 villages, and one municipal corporation, Visakha City. Visakhapatnam is a major industrial center housing India's largest ship building yard, one of the country's seven steel plants, and the Eastern Naval Command. Visakha City is one of India's major port cities.

Population size estimates and population growth

According to the 2001 Census, the Visakhapatnam District population totaled 3,816,820 individuals, a 13.9% increase from 1991. Males made up 50.4% of the population and females 49.6%. The literacy rate for the district was 69.8% for males and 51.2% for females. Approximately 60% (2,285,792) of the population lived in a rural area. The population growth of Visakha City is shown in Figure 1.

Figure 1. Population Growth of Visakha City*



*Source: Visakhapatnam Urban Development Authority (VUDA) <http://www.vuda.org/index.asp>

Government-funded Public Health System

The Visakhapatnam District's government-supported public health delivery system is divided into three tiers with the most specialized care available at the tertiary level. On the first tier are the 90 Primary Health Centers (PHC), which are staffed with two physicians and provide basic health care services. The PHCs in Visakhapatnam District

each have a catchment population of 40,000-50,000 people. Twenty-three PHCs are in rural areas serving tribal populations.

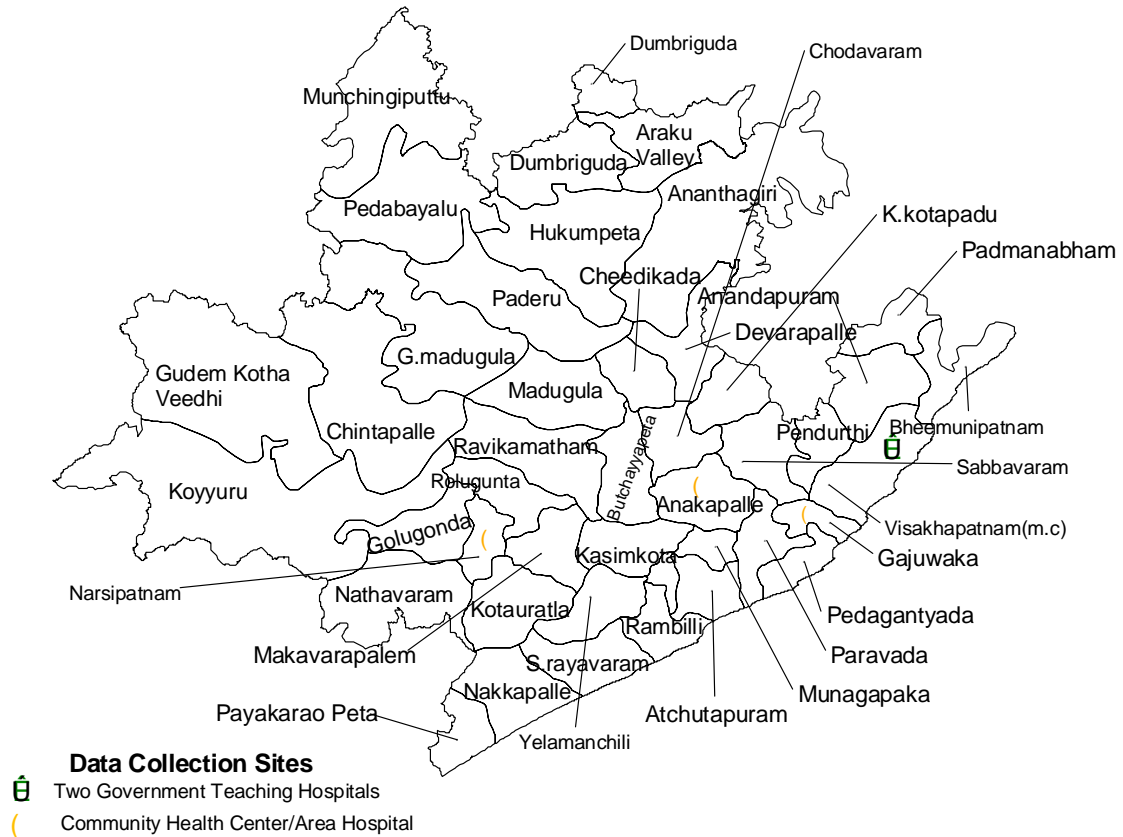
The PHCs are overseen by the District Leprosy Office, which also serves as the Nodal Office for HIV/AIDS. The District Leprosy Office is based in Visakha City and includes a number of staff distributed across the district. The District Leprosy Officer (DLO) oversees 97 Assistant Paramedical Officers (one for every 30,000 people in the district) and 25 Deputy Paramedical Officers. The DLO serves as the Nodal Officer for HIV/AIDS and utilizes the District Leprosy Office infrastructure for HIV/AIDS-related activities. The DLO reports to AP SACS.

In the second tier are Community Health Centers (CHC) and the District Hospital, which serve as referral units for the PHCs. The four CHCs include Narsipatnam Area Hospital (Narsipatnam Mandal), Aganampudi Hospital (Gajuwaka Mandal), K. Kotapadu Hospital (K. Kota Mandal), and Anakapalle Area Hospital (Anakapalle Mandal). Anakapalle Area Hospital is also designated as the District Hospital (Figure 2).

On the third tier are the five government teaching hospitals in Visakha City, which provide specialized care: King George Hospital (KGH), Victoria General Hospital (VGH) a maternity hospital, the CHEST Hospital (tuberculosis), the Regional Eye Hospital, and the Mental Hospital. The two government-funded blood banks are located at VGH and KGH. KGH is the largest hospital in the district and serves as the main referral center for tertiary care for the CHCs as well as the District Hospital.

Government-sponsored voluntary counseling and testing centers are currently available at the second and third tier of the health care system. During the 2002 fiscal year, there were VCTCs at the Anakapalle District Hospital, Narsipatnam Hospital (a CHC), and two of the teaching hospitals, King George Hospital and Victoria General Hospital.

Figure 2. Map of Visakhapatnam District and Data Collection Sites



QUESTION 2. What is the scope of the HIV/AIDS epidemic in Visakhapatnam District?

OVERVIEW

Data were examined from a variety of government-funded venues in order to determine the scope of the HIV/AIDS epidemic in Visakhapatnam District for the 2002 fiscal year. The data describe only those seeking care in publicly funded settings and cannot be assumed to represent those seeking care in the private sector or not seeking care at all. Table 1 provides an overview of the number of individuals screened for HIV in each venue and the corresponding percentage that were infected with HIV.

Table 1. HIV Prevalence among Visakhapatnam Epidemiologic Profile Data Sources, April 2002 – March 2003 *

Data Type and Site	Total Screened	Number HIV Positive	Percent HIV Positive
PPTCT			
King George Hospital***	2,898	61	2.1%
Victoria General Hospital**	3,196	31	1.0%
Anakapalle Area Hospital***	369	7	1.9%
VCTC			
Dept of Microbiology Andhra Medical College**	3,791	1,098	29%
Narsipatnam Area Hospital**	691	66	10%
Anakapalle Area Hospital***	1,006	118	12%
Blood Bank**			
King George Hospital	5,139	97	1.9%
Sentinel Survey Data**			
STD Clinic (AMC)	250	74	29.6%
Female Sex Workers	250	32	12.8%
ANC Clinic (Anakapalle)	400	4	1.0%
ANC Clinic (Aganampudi)	400	9	2.3%

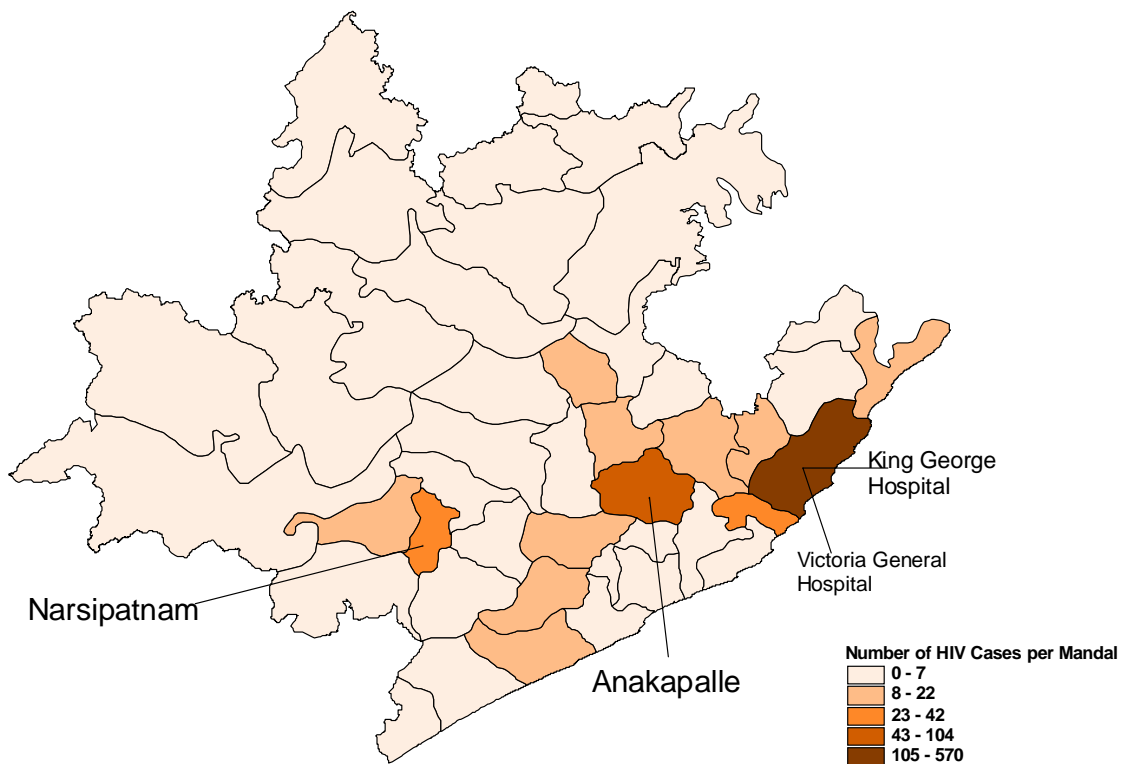
*Note: Number of HIV positive cases are cited from the Andhra Pradesh State AIDS Control Society and local hospital records. Actual number of HIV positive cases used in the Visakhapatnam Epidemiologic Profile analyses may vary due to differences encountered during data abstraction.

**Sources: (1) Andhra Pradesh State AIDS Control Society – Visakhapatnam District Annual Performance on Key Parameters (April 2002 – March 2003) and (2) AP SACS at a Glance (2003 Publication)

***Source: Hospital Records

Figure 3 depicts the geographical distribution of cumulative HIV cases reported by the three PPTCTs, three VCTCs, and the KGH blood bank during the 2002 fiscal year. The cases are presented by mandal. As the cases are limited to those reported by government facilities, the true number of cases in the district might be underestimated. Distribution of HIV/AIDS Cases by Mandal Reported in Visakhapatnam District, 2002 Fiscal Year.

Figure 3. Distribution of HIV/AIDS Cases by Mandal Reported in Visakhapatnam District, 2002 Fiscal Year*



* HIV cases identified in the following venues: 3 VCTCs, 3 PPTCTs, and 1 blood bank.

** Cases limited to government facilities in three mandals, which may underestimate the true number of HIV cases in the district.

PPTCT Data

Data from three PPTCTs were included in the profile. PPTCT data provides a proxy for general population prevalence among low risk women accessing government-funded health care. PPTCT clients were women seeking routine antenatal care who received HIV counseling as part of their antenatal visit and agreed to an HIV test. The sites included two urban clinics (Victoria General Hospital and King George Hospital) and one rural clinic (Anakapalle Area Hospital). The Anakapalle PPTCT center opened in

late November 2002, and the shorter time period explains the low number of patients for whom data were available. The percentage of HIV positive pregnant women varied between the three sites. KGH had the largest percentage of women screened for HIV that tested positive, 2.1% (Table 1). The most common reported risk behavior for women who tested HIV positive at KGH was that their spouse was not monogamous. Over one-third (34.4%) of HIV positive KGH attendees reported that their spouse had multiple sexual partners and an additional 13.1% reported that their husband had extra marital exposure (Table 9).

VCTC Data

Data from VCTCs at Narsipatnam Area Hospital, Andhra Medical College Microbiology Department, and Anakapalle Area Hospital were included in the epidemiologic profile. HIV seroprevalence was considerably greater among VCTC patients than among PPTCT sites. Individuals served at VCTC sites were generally at increased risk for HIV infection, as perceived by the patient or the referring party (e.g. physician). The AMC VCTC prevalence was significantly higher at 29% (1,098 of 3,791) than the other two sites ($p < .000$). Seropositivity rates for the two rural VCTCs were similar: ten percent of Narsipatnam VCTC patients tested HIV positive and 12% of Anakapalle VCTC patients were HIV positive (Table 1).

Twenty-nine percent of AMC patients tested HIV positive. The percentage of AMC VCTC patients that had previously tested HIV positive elsewhere is unknown. Among male AMC VCTC patients, multiple heterosexual partners was the most commonly reported risk behavior for HIV positive men (598 of 630 males, or 95%) (Table 14). Among HIV positive female AMC VCTC patients, 48.2% cited their spouse's HIV infection as the reason for seeking an HIV test. Risk information and reason for visit data were generally less complete at the two rural sites. The most commonly reported reason for VCTC visit among seropositive rural VCTC patients was prolonged illness (86.1%, 93 of 108) at Anakapalle and history of risk behavior (34.5%, 19 of 55) at Narsipatnam.

Blood Bank Data

Blood bank data from those who were preliminarily accepted as blood donors at the KGH blood bank based on behavioral screening showed a seroprevalence of 1.9% (97 of 5,139 persons were HIV positive). Persons seeking to donate blood (in settings where there are no incentives to do so) are generally considered representative of the general population. As expected, the seroprevalence was similar to that seen in the PPTCT sites. Those who tested HIV positive at the blood banks were primarily male (90 cases, 93%) and most (87%) were replacement donors.

Sentinel Surveillance Data

HIV prevalence data in Table 1 also include sentinel surveillance data for 2003. These data include information on 800 women screened systematically for HIV at two antenatal clinics (Anakapalle and Aganampudi), 250 individuals screened systematically for HIV at the STD clinic at AMC, and 250 female sex workers. Among ANC clients, 1.0% (4/400) tested positive at Anakapalle Area Hospital and 2.3% (9 of 400) tested

positive at Aganampudi Area Hospital. Individuals screened at the STD clinic had much higher seroprevalence (29.6%, 74 of 250), consistent with risk behavior.

AIDS Case Data

The reported number of AIDS cases across the district was 140 for the 2002 calendar year. The primary transmission mode was sexual (86.4%) (Table 3). The majority of individuals diagnosed with AIDS were between 20-29 years of age (45%) and 59.3% were male. The most commonly reported opportunistic infection (O.I.) was tuberculosis (51.8%) (Table 2). The degree of overlap between persons testing HIV positive in VCTC or PPTCT sites and persons diagnosed with AIDS during this period is unknown.

NGO Data

Data were also collected from Green Vision, an NGO providing HIV care and support in Visakhapatnam. Slightly more than half of Green Vision patients were male (56.4%), and 78% of patients had an HIV-positive spouse. The majority of patients (93.2%) received medications at Green Vision to treat their HIV-related conditions, e.g. opportunistic infections.

ANALYSES OF DATA FROM INDIVIDUAL SOURCES

1. AIDS CASE DATA

Overview

National AIDS Control Organization (NACO) guidelines require that physicians report individual AIDS cases to state AIDS control societies using a standardized NACO form. Facilities and providers in Andhra Pradesh submitted aggregate monthly reports to the AP State AIDS Control Society during the 2002 fiscal year. As of April 2003, a cumulative total of 335 cases of persons living with AIDS and 31-AIDS-related deaths in Visakhapatnam District had been reported to AP SACS.

Five government-funded hospitals in Visakhapatnam reported 140 AIDS cases to AP SACS: King George Hospital, CHEST Hospital, Victoria General Hospital, Mental Hospital, and the Regional Eye Hospital during the 2002 calendar year (January-December). The hospitals submitted aggregate reports rather than an individual-level NACO form for each AIDS case. In the interest of including individual-level data in the epidemiologic profile, AP SACS personnel conducted a three-day chart review at King George Hospital and the CHEST Hospital on AIDS cases diagnosed between April 2002 and March 2003. They attempted to include all cases. Forty-five cases were collected from each site for a total of 90 individual-level AIDS case reports. Data for a number of variables were entered directly into a Microsoft Excel spreadsheet from the medical chart.

Population

The AIDS case data describe individuals who are at advanced stages of HIV disease and who were patients at one of two government-funded hospitals, KGH or CHEST. KGH is the largest hospital in the district and provides the most advanced care among the publicly funded health facilities. KGH receives referral cases from the four

Community Health Centers, which provide secondary level care to the district's more rural populations. KGH patients are tested at the Andhra Medical College VCTC. The CHEST Hospital provides care to tuberculosis patients.

Analysis

Aggregate-Level Data January-December 2002:

Aggregate data were available from AP SACS for the 140 AIDS cases reported during the 2002 calendar year (82 males, 58 females). (It should be noted that gender was not always recorded consistently; in some instances there were 83 males and 57 females, e.g. Table 3.) This time period differs from the fiscal year period (April 2002 – March 2003) used for other data sources included in the epidemiologic profile.

Sexual transmission was the predominant route of HIV infection (86.4%: 121 of 140 cases) (Table 3). Forty-five percent (63 of 140) of AIDS cases were between 20-29 years of age (Table 4). Female cases tended to be younger than male cases, with the majority (56.9%: 33 of 58) between the ages of 20-29 years. Among male cases, 36.6% (30 of 82) were between 20-29 years and an additional 35.4% (29 of 82) were between 30-39 years of age. Aggregate data on opportunistic infections (O.I.) indicated that the most common O.I. was tuberculosis (51.8%: 71 of 137) followed by Candidiasis (28.5%: 39 of 137). The pattern was similar for both males and females (Table 2). The data could not be disaggregated by institution, which precluded determining whether the large proportion of TB was due to a larger number of AIDS cases reported by the CHEST Hospital.

Table 2. Opportunistic Infections* Among Visakhapatnam AIDS Cases (Jan-Dec 2002)**

	Males		Females		Total	
	Number	%	Number	%	Number	%
O.I.s***						
Tuberculosis	47	48.5	24	60	71	51.8
Candidiasis	27	27.8	12	30	39	28.5
PCP	8	8.2	1	2.5	9	6.6
Herpes	2	2.1	2	5	4	2.9
Parasitic infection (general)	4	4.1	1	2.5	5	3.6
Others	9	9.3	0	0	9	6.6
Total	97	100	40	100	137	100

*Note: Some individuals have more than one O.I., which explains why there are 97 counts of O.I.s among a sample of 83 men.

**Source: Andhra Pradesh State AIDS Control Society

***Zero reported cases of Cryptosporidium, Toxoplasmosis, and Kaposi's sarcoma.

Table 3. Transmission Route Among Visakhapatnam AIDS Cases (Jan-Dec 2002)*

Transmission Route	Males		Females		Total	
	Number	%	Number	%	Number	%
Adults						
Sexual	74	89.2	47	82.5	121	86.4
Blood/Blood Products	0	0	1	1.8	1	0.7
Infected Syringe	0	0	0	0	0	0
Other	7	8.4	4	7	11	7.8
Not Specified	1	1.2	3	5.3	4	2.9
Children						
Perinatal	1	1.2	1	1.8	2	1.4
Other	0	0	1	1.8	1	0.7
Total	83	100	57	100	140	100

*Source: Andhra Pradesh State AIDS Control Society

Table 4. Age Distribution Among Visakhapatnam AIDS Cases (Jan-Dec 2002)*

Age Range	Males		Females		Total	
	Number	%	Number	%	Number	%
0-5 years	1	1.2	1	1.7	2	1.4
6-14 years	0	0	0	0	0	0
15-19 years	2	2.4	3	5.2	5	3.6
20-29 years	30	36.6	33	56.9	63	45
30-39 years	29	35.4	12	20.7	41	29.3
40-49 years	17	20.7	6	10.3	23	16.4
50-59 years	3	3.7	1	1.7	4	2.9
60+	0	0	2	3.4	2	1.4
Total	82	100	58	100	140	100

*Source: Andhra Pradesh State AIDS Control Society

Individual-Level Data April 2002-March 2003:

Individual-level analysis was completed on data from 90 AIDS case records at KGH Hospital and the CHEST Hospital in Visakha City. Sociodemographic characteristics and diagnosed opportunistic infections are presented in Table 5. Males were overrepresented in both datasets (29 of 45 at KGH and 33 of 45 (at CHEST).

Table 5. Characteristics of Individual-Level AIDS Cases at King George Hospital and the CHEST Hospital, n=45 per site.

Demographic Variables	King George Hospital		CHEST Hospital	
	Number	%	Number	%
Sex				
Female	16	35.6	12	26.7
Male	29	64.4	33	73.3
STD/O.I.s				
VRDL	2	4.4	0	
Kaposi sarcoma	0	0	0	
Cryptosporidiosis	1	2.2	0	
Toxoplasmosis	1	2.2	0	
Tuberculosis	0	0	45	100
Missing	41	91.1	0	
Age (years)				
Minimum	18		19	
Average	35		33	
Maximum	65		50	
Marital Status				
Married	16	35.6	33	73.3
Unmarried	1	2.2	2	4.4
Missing	28	62.2	10	22.2
Job Category				
Agriculture	3	6.7	2	4.4
CSW	1	2.2	0	
Housewife	4	8.9	0	
Service Sector – skilled	1	2.2	4	8.9
Service Sector – unskilled	3	6.7	25	55.6
Transportation	2	4.4	2	4.4
Missing	31	68.9	12	26.7

2. BLOOD BANK DATA

Overview

During the last fiscal year, 5,139 individuals were preliminarily accepted as blood donors at the King George Hospital blood bank based on self-reported behavioral screening. All donated units of blood were tested for HIV, syphilis, Hepatitis C, Hepatitis B, and malaria. Among accepted blood bank donors, 97 (1.9%) tested HIV positive. Their donated units of blood were not accepted for transfusion or for other uses.

Population

Blood bank data included information from individuals who were preliminarily accepted as donors at the King George Hospital blood bank between April 2002 and March 2003 and who were subsequently deferred from donation because they tested positive for

HIV. Donors are classified as either replacement or voluntary donors. Replacement donors are individuals who donate blood on behalf of a specific person, usually a family member. Per the head of the KGH blood bank, approximately 30% of all accepted donors were voluntary donors and 70% were replacement donors.

Data were collected for the 97 HIV positive individuals. HIV negative donors were not sampled for data collection because the behavioral screening process removes individuals citing risk behavior from this population.

Analysis

HIV positive blood donors had an average age of 30.9 years. The majority of the 97 HIV positive accepted blood donors were male (92.8%), replacement donors (86.6%) (Table 6). It is possible that replacement donors were overrepresented among HIV positives (comprising 87% of HIV positive persons as compared to 70% of all donors) since voluntary donors might not donate if they know they are HIV positive.

None of the HIV positive donors was co-infected with syphilis, Hepatitis C, or malaria. One individual was co-infected with Hepatitis B.

Table 6. Sociodemographic Characteristics of HIV Positive, Accepted Blood Donors at KGH Blood Bank (n=97)

Demographic Variable	Number	%
Sex		
Female	7	7.2
Male	90	92.8
Education		
Illiterate	18	18.6
1st-4 th	2	2.1
5th-8 th	20	20.6
9th-10 th	29	29.9
Intermediate	4	4.1
Diploma/Degree	18	18.6
Post Graduate	6	6.2
Age Distribution		
Minimum		19.0
Mean		30.9
Maximum		52.0
Job Category		
Agriculture	9	9.3
Business	17	17.5
Employed – private	3	3.1
Employed – public/government	5	5.2
Employed – unspecified	3	3.1
Housewife	1	1.0

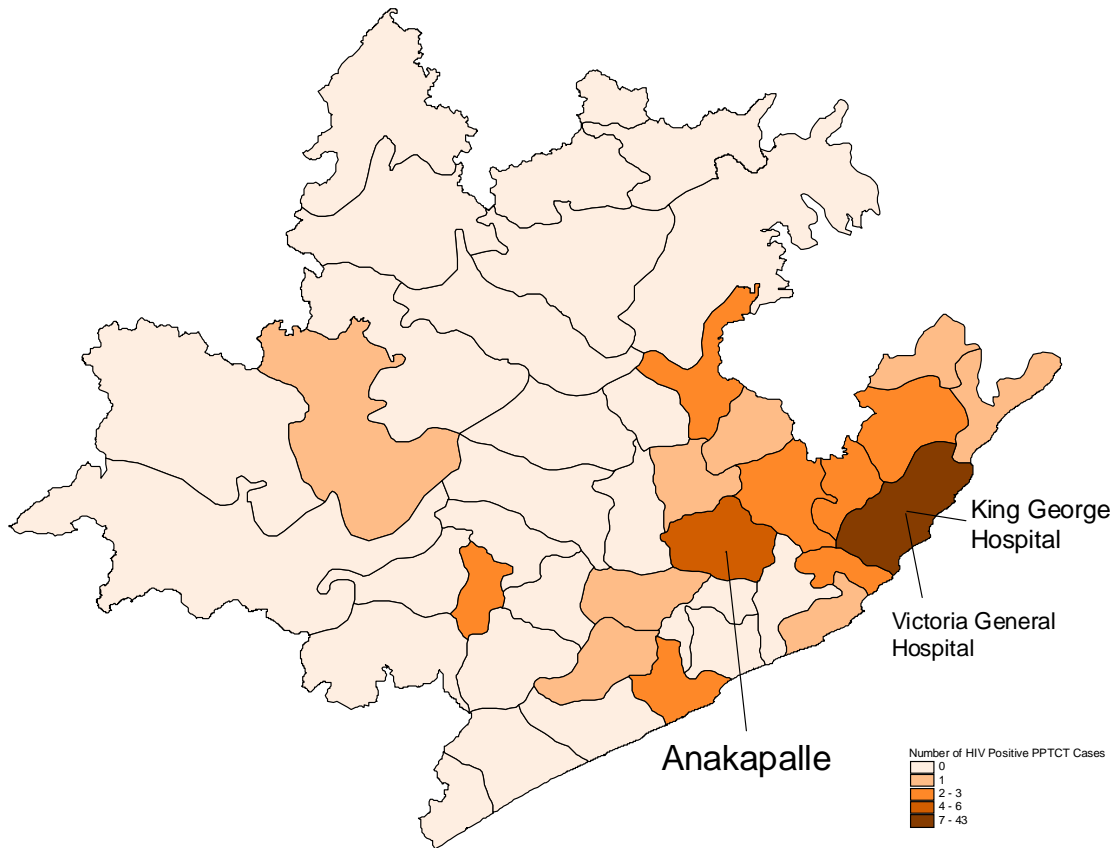
Missing	2	2.1
Professional	3	3.1
Service Sector – skilled	14	14.4
Service Sector – unskilled	13	13.4
Student	7	7.2
Transportation	10	10.3
Unemployed	10	10.3
Donor Type		
Replacement	84	86.6
Volunteer	13	13.4

3. PREVENTION OF PARENT TO CHILD TRANSMISSION (PPTCT) DATA

In Andhra Pradesh, 49.8% of live births take place at a health facility according to a MEASURE DHS+ survey conducted in 1998-1999 of ever-married women, ages 15-49 years (www.measuredhs.com). Antenatal clinic patients are considered representative of the general population in terms of risk for HIV with the caveat that representation is limited to women attending government-funded antenatal clinics. PPTCT data were collected from three antenatal sites in Visakhapatnam District: King George Hospital, Anakapalle Area Hospital, and Victoria General Hospital. Figure 4 depicts the geographical distribution of HIV cases by mandal identified at these three sites.

The PPTCT centers utilize the same pre- and post-test registers used by VCTC to collect individual-level data. Pre-test counseling sessions generally occur in a 1:5 ratio with a counselor and antenatal clinic clients. Similar to the VCTC data, sociodemographic variables were fairly complete. Information on reason for visit and risk behavior were quite sparse, possibly due to group counseling sessions and including HIV testing within the general antenatal clinic visit. According to counselors, HIV testing is free of charge at PPTCT sites.

Figure 4. Distribution of PPTCT Cases by Mandal During 2002 Fiscal Year in Visakhapatnam District



* PPTCT sites include: King George Hospital, Victoria General Hospital, and Anakapalle Area Hospital

** Cases limited to government facilities in two mandals, which may underestimate the true number of HIV cases in the district.

A. King George Hospital PPTCT Center

Overview

The King George Hospital (KGH) is a teaching hospital in Visakha City and is the largest hospital in the district. The KGH PPTCT center is located in the outpatient ward and is staffed with a male and female counselor, a medical officer, and a laboratory technician. Individual-level data are collected from pregnant women who come in for antenatal care visits and who are counseled and voluntarily tested for HIV.

Population

KGH PPTCT records showed a total of 3,679 women were registered as new outpatient antenatal clinic patients between April 19, 2002 and March 25, 2003. Data were abstracted from PPTCT records for the sixty-one women (2.1%) who tested positive for HIV as well as for a sample of women testing HIV negative. The sample of HIV negative women was drawn by calculating 10% of the total number of women tested each month, and a corresponding number of HIV negative records were abstracted. For example, if 100 women were tested for HIV in January, then records from the first 10 HIV negative women were abstracted for January. For KGH PPTCT, information

was abstracted from 231 HIV negative records. Information on ten men (spouse/partner) was collected in the PPTCT registers, but this information was not included in the epidemiologic profile. In addition, some data were missing for April through June 2002 since individual-level records were not uniformly maintained by the facility during this time period.

Table 7 describes the number of new patients registered at the PPTCT center per month, the number of these patients counseled to test for HIV, the number who were tested, and the number who tested HIV positive. Overall, 84% of newly registered ANC clients were counseled and of these, 94% were tested for HIV.

Table 7. Case Load of King George Hospital PPTCT Center

Time Period	New ANC Clients	Women Counseled		Women Tested for HIV		HIV Positive*
		Number	% of ANC Clients	Number	% of ANC Clients	
April 19-30, 2002	123	115	93	102	83	3
May-02	379	320	84	302	80	2
Jun-02	390	320	82	318	82	6
Jul-02	337	330	98	328	97	11
Aug-02	344	250	73	212	62	4
Sep-02	316	250	79	180	57	4
Oct-02	305	225	74	217	71	6
Nov-02	279	228	82	208	75	2
Dec-02	287	253	88	253	88	6
Jan 1-25, 2003	215	167	78	161	75	6
Jan 26-Feb 25, 2003	368	328	89	318	86	4
Feb 26-March 25, 2003	336	299	89	299	89	6
Total	3,679	3,085	84	2,898	79	60*

*Total number of HIV positive cases included in analysis is 61. An additional case was reported on March 28, 2003, which is beyond the monthly reporting period used by the PPTCT, but is within the timeframe used for the epidemiologic profile.

Analysis

Table 8 describes the sociodemographic characteristics of both the HIV positive women and a sample of the HIV negative women who attended the KGH PPTCT. For both groups, the highest proportion had been educated up to the 10th standard. The mean age of clients was 22 and 23 years, respectively. The largest proportion of women in both groups had spouses who worked in the unskilled service sector.

Table 8. Sociodemographic Characteristics of KGH PPTCT Attendees

Demographic Variable	HIV Positive (n=61)		HIV Negative (n=231)	
	Number	%	Number	%
Education				
Illiterate	10	16.4	58	25.2
Up to 4 th Standard	11	18.0	48	20.9
Up to 8 th Standard	4	6.6	22	9.6
SSC	13	21.3	79	34.3
Degree	3	4.9	17	7.4
Post Graduate Degree	0	0	2	0.9
Missing	20	32.8	4	1.7
Age (years)				
Minimum		18		15
Mean		23		22
Maximum		36		36
Spouse's Occupation				
Agriculture	5	8.2	5	2.2
Business	2	3.3	16	6.9
Employed - public/government	0	0	6	2.6
Employed – unspecified	1	1.6	4	1.7
Employed – private	1	1.6	14	6.1
Missing	23	37.7	44	19.0
Professional	1	1.6	5	2.2
Service Sector – unskilled	16	26.2	88	38.1
Service Sector - skilled	4	6.6	24	10.4
Transport	8	13.1	25	10.8

Risk information was primarily available only for women who tested positive for HIV, however it was still missing for 41% of these women (Table 9). Among HIV positive women, the most commonly reported risk was a spouse who had multiple heterosexual partners (34.4%, 21 of 61), followed by those who reported they had a spouse with extra marital exposure (13.1%, 8 of 61). The “Reason for visit” variable was primarily completed as “ANC visit” (86%, 251 of 292) and therefore was of limited use.

Table 9. Risk Behavior by HIV Status Among KGH PPTCT Clients

Risk Behavior	HIV Positive (%)	HIV Negative (%)
Heterosexual – Multiple Partners (spouse)	21 (34.4)	0
Men Who Have Sex with Men (spouse)	2 (3.3)	2 (.9)
Needle Stick Injury	0	0
Other	1 (1.6)	0
Unknown	4 (6.6)	174 (75.3)
Husband – Extra Marital Exposure	8 (13.1)	0
Missing	25 (41.1)	55 (23.8)
Total	61	231

B. Victoria General Hospital (VGH), PPTCTOverview

The Victoria General Hospital is one of five teaching hospitals in Visakha City and provides care primarily to pregnant women. The PPTCT center started in May 2002 and is staffed with a male and female counselor, a laboratory technician, a receptionist, and a medical officer. The center is run in conjunction with Francois Xavier Bagnoud (FXB), a Swiss-based non-governmental organization that provides infrastructure support. The NGO provides two staff (a counselor and a receptionist) as well as furniture, light fixtures, and fans. Monthly reports to AP SACS showed 3,196 women were counseled and screened for HIV at VGH from May 2002 to March 2003.

Population

Individual-level data were collected at the VGH PPTCT for pregnant women who came in for regular antenatal care visits and who were counseled and tested for HIV by a PPTCT counselor. From May 2002 through March 2003, approximately 7,100 women received antenatal care and of these, 3,196 (45%) were screened for HIV. AP SACS aggregate reports showed 31 of these women (1.0%) tested HIV positive. Four additional cases were identified during data abstraction and individual-level information was subsequently collected for 35 HIV positive women as well as for a sample of women testing HIV negative. The sample of HIV negative women was drawn by calculating 10% of the total number of women tested each month, and a corresponding number of HIV negative records were abstracted. For example, if 100 VGH PPTCT clients were tested for HIV in January, then records from the first 10 HIV negative women were abstracted for the month. For VGH PPTCT, information was collected from 375 HIV negative records.

Analysis

Table 10 provides details about the sociodemographic characteristics of the VGH PPTCT Attendees. Among the 35 women who tested HIV positive, the mean age was 21 years. The mean age for those testing HIV negative was 22 years. The majority of women in both groups had educations of 4th standard or below. Housewives made up the largest proportion of women in both groups. Ninety-seven percent of HIV positives and 99% of HIV negatives reported being married.

Thirty HIV positive women (86%) were from Visakhapatnam District and five (14%) were from neighboring Vizianagaram District. Among HIV negative women, 98% were from Visakhapatnam and only 1% were from Vizianagaram. Risk information was largely missing for this population; 80% 'missing' for women testing HIV positive and 62.4% 'missing' or 'unknown' for women testing HIV negative.

Some additional information was available for a limited number of the HIV positive clients. Eighty-three percent of HIV positive women (29 of 35) reported that their partners had never used a condom. Three women (n=35) reported Nevaripine use and delivery of HIV negative babies. Two women (n=35) reported medical termination of their pregnancies. Data on the remaining 30 pregnancy outcomes were not available.

Table 10. Sociodemographic Characteristics of VGH PPTCT Attendees

Demographic Variable	HIV Positive (n=35)		HIV Negative (n=375)	
	Number	%	Number	%
Education				
Illiterate	12	34.3	151	40.3
Up to 4 th Standard	16	46.7	60	16.0
Up to 8 th Standard	2	5.7	47	12.5
SSC	3	8.6	95	25.3
Degree	2	5.7	18	4.8
Post Graduate	0	0	3	0.8
Degree	0	0		
Missing	0	0	1	0.3
Age				
Minimum		18		15
Mean		21		22
Maximum		28		40
Occupation (self)				
Agriculture	4	11.4	13	3.5
Business	0	0	2	0.5
Employed – private sector	0	0	1	0.3
Housewife	20	57.1	330	88.0
Service Sector – skilled	0	0	0	0
Service Sector – unskilled	10	28.6	21	5.6
Student	1	2.9	0	0
Missing	0	0	8	2.1
Husband's Occupation*				
Agriculture	2	5.7		
Business	2	5.7		
Service Sector – skilled	6	17.1		
Service Sector – unskilled	10	28.6		
Transportation	11	31.4		
Missing	4	11.4		

*Information only available for HIV positive women

C. Anakapalle Area Hospital, PPTCT

Overview

Anakapalle Area Hospital is one of three rural hospitals from which data are included in the epidemiologic profile. Anakapalle is designated as the District Hospital and was built in 2001 approximately 30.5 kilometers from Visakha City. The hospital is one of four government-funded Community Health Centers providing secondary level care to the district's 3,816,820 people. The PPTCT center officially opened in November 2002 and HIV counseling and testing services started in December 2002. The center is located adjacent to the antenatal outpatient ward and is staffed with a medical officer, one female counselor, and shares a laboratory technician with the hospital's VCTC. All women who test HIV positive at Anakapalle Area Hospital's PPTCT Center are referred to King George Hospital in Visakha City for follow-up care.

Population

According to the Anakapalle Area Hospital PPTCT center records, a total of 1,082 women were registered as new outpatient antenatal clinic attendees at Anakapalle Area Hospital between November 22, 2002 and March 25, 2003 (Table 11). Only thirty-four percent (369 of 1,082) of all new registrants were tested for HIV. Among the 1,082 women, 73% (n=788) received antenatal counseling, which includes information on antenatal care, nutrition, awareness of HIV risk reduction strategies, and follow up advice. Of new patients counseled, 47% (369 of 788) were tested for HIV. Eighty-nine percent (328 of 369) of women tested for HIV received their test results. Of those tested, 1.9% (7 of 369) were HIV positive. Data were collected for these 7 HIV positive women as well as for a sample (n=37) of women testing HIV negative. Ten percent of the total number of women tested per month was calculated and the corresponding number of HIV negative records was abstracted. For example, if 100 Anakapalle PPTCT clients were tested for HIV in January, then data were collected from records for the first 10 HIV negative patients in January.

Table 11. Case Load of Anakapalle Area Hospital PPTCT Center

Time Period	New ANC Clients	Women Counseled		Women Tested for HIV		Women Who Received Test Results		HIV Positive
		Number	% of Clients	Number	% of Clients	Number	% of Clients	
Nov 22-Dec 25, 2002	270	204	76	110	41	100	37	0
Dec 26 – Jan 25, 2003	226	140	62	97	43	84	37	4
Jan 26 – Feb 25, 2003	291	240	82	55	19	50	17	1
Feb 26 - March 25, 2003	295	204	69	107	36	94	32	1
Total	1,082	788	73	369	34	328	30	6*

*Total number of HIV positive cases included in analysis is seven. An additional case was reported on March 28, 2003, which is beyond the monthly reporting period used by the PPTCT, but is within the timeframe used for the epidemiologic profile.

Analysis

The majority of sociodemographic characteristics did not vary by HIV status however, the small number of patients makes generalization from these data problematic. Among the Anakapalle PPTCT patients, the mean age was 23 for HIV positive patients (n=7) and 21 for negative patients (n=37). All women were married and listed their occupation as housewives. All seven women who tested HIV positive reported that they referred themselves for an HIV test, while 70% of women who tested negative reported self-referral and an additional 30% of negative patients reported referral by a doctor. Data were not available as to why the seven women referred themselves for an HIV test. All of the patients had unknown risk behavior. Table 12 provides the educational breakdown of the forty-four women.

Table 12. Demographic Characteristics of Anakapalle Area Hospital PPTCT Attendees (n=44)

Demographic Variable	HIV Positive (n=7)		HIV Negative (n=37)	
	Number	%	Number	%
Age				
Minimum		18		16
Mean		23		21
Maximum		25		28
Education				
Illiterate	5	71.4	18	48.6
Up to 4 th Standard	0	0	3	8.1
Up to 8 th Standard	0	0	9	24.3
SSC	0	0	6	16.2
Degree	1	14.3	1	2.7
Post Graduate Degree	0	0	0	0
Missing	1	14.3	0	0

All HIV positive women were from Visakhapatnam District. Eleven percent of HIV negative women were from the neighboring district of Vizianagaram and the remaining HIV negative women were from Visakhapatnam.

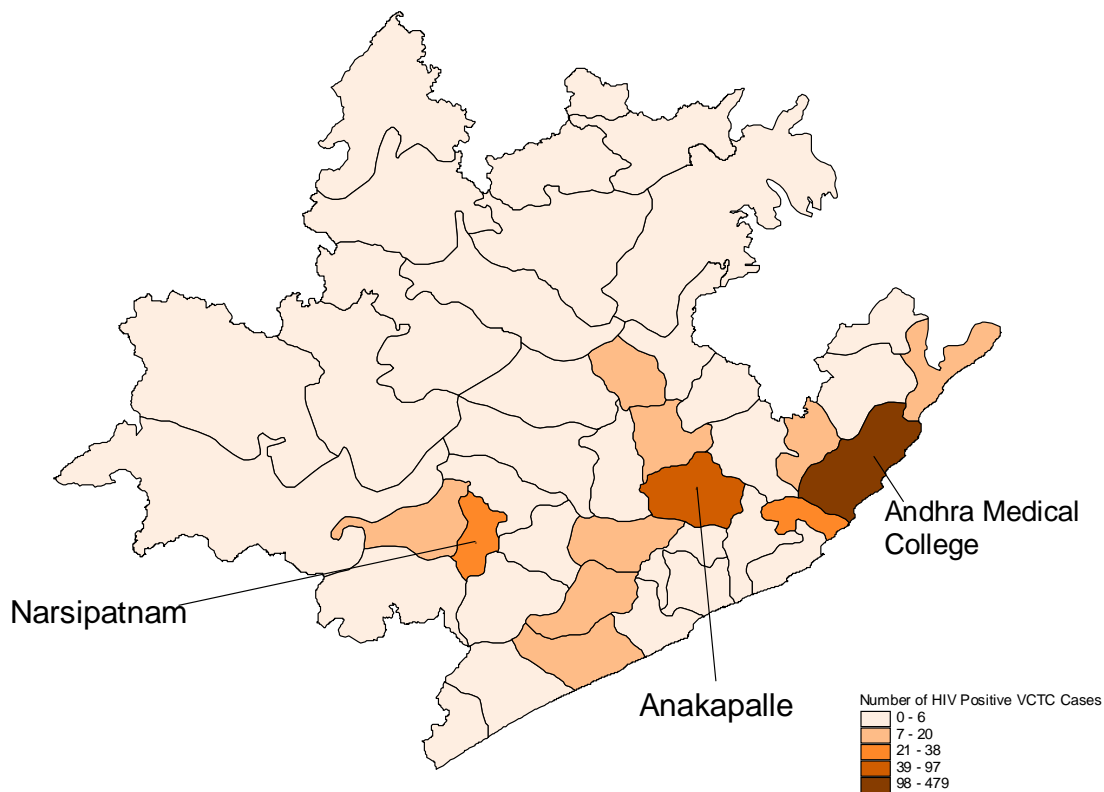
Additional medical information was available for the seven HIV positive clients. Two women opted for medical termination of pregnancy. One woman was administered Nevaripine, but her child subsequently died. One child was born HIV positive. Two individuals were referred to KGH for follow-up care. One individual was lost to follow-up since she did not return to the PPTCT center.

4. VOLUNTARY COUNSELING AND TESTING DATA

Voluntary counseling and testing data were abstracted from records at three sites in Visakhapatnam District: Andhra Medical College's Microbiology Department, Anakapalle Area Hospital, and Narsipatnam Area Hospital. Figure 5 shows the geographical distribution of HIV cases identified at these three sites by mandal.

Three HIV laboratory tests are used for diagnosis including, ELISA Xyton, Tridot, and Capillus. The three VCTC sites collect data using the pre- and post-test counseling session register provided by the government. In addition, the AMC VCTC collected data on a few of the items included in the National AIDS Control Organization (NACO)-generated 51-item VCTC questionnaire. Sociodemographic information was collected with a high degree of completeness across the three sites. Reason for visit and risk behavior data were generally not as complete as the sociodemographic variables, especially at the two area hospitals (Anakapalle and Narsipatnam). Common responses to the 'reason for visit' question at these two sites included 'missing' and 'other'. Among the HIV positive male patients at Andhra Medical College VCTC, 53.7% (338 of 630) listed prolonged illness as the reason for the VCTC visit and 95% (598 of 630) listed multiple (heterosexual) partners as their risk behavior. Among HIV positive female patients at AMC, 48.2% (191 of 396) cited their spouse's HIV infection as the reason for their visit.

Figure 5. Distribution of VCTC Cases by Mandal During 2002 Fiscal Year in Visakhapatnam District



* VCTC sites include: Andhra Medical College - Microbiology Department, Anakapalle Area Hospital, Narsipatnam Area Hospital
 ** Cases limited to government facilities in three mandals, which may underestimate the true number of HIV cases in the district.

A. Andhra Medical College, Microbiology Department, VCTC

Overview

Andhra Medical College neighbors King George Hospital, which is the main referral hospital and attracts a number of clients from across the district seeking specialized care.

A medical officer, one counselor, and one laboratory technician staff the VCTC. A 51-item survey was available for the pre-test assessment interview. Due primarily to time constraints, the counselor was unable to follow the 51-item survey verbatim. Instead, the counselor reviewed the pre-test questions supplied in the VCTC register and asked a limited number of questions from the 51-item survey instrument.

Pre-test and post-test interview sessions are all conducted in a 1:1 ratio of counselor and patient. Data for each patient are stored in four separate registers in order to ensure confidentiality. A patient's HIV status is indexed using a patient identification number (PID) and a separate register includes the PID number and the patient's name

and address. Prior to May 2003, VCTC tested pre/post operative patients together with other VCTC patients

Population

AP SACS records show that 3,791 individuals were counseled and screened for HIV at AMC VCTC from April 2002 to March 2003. Of those, 1,098 (29%) were HIV positive. Data were available and were abstracted for 1,031 HIV positive VCTC patients. The sample of HIV negative individuals were drawn by calculating 10% of the total number of people tested each month, and a corresponding number of HIV negative records were abstracted. For example, if 100 people were tested for HIV in January, then records from the first 10 HIV negative individuals were abstracted for the month.

HIV prevalence was high among this population. The percentage of AMC VCTC patients that may have previously tested HIV positive elsewhere is not known.

Analysis

Table 13 describes the sociodemographic characteristics of both those who tested HIV positive at the AMC VCTC and a sample of those who tested HIV negative. The majority of sociodemographic characteristics did not vary by HIV status. Among the 1,031 AMC VCTC clients who tested positive, 61.5% (n=634) were male and 39.4% (n=406) were illiterate. Proportions among the sample of HIV negative individuals (n=372) were similar (Table 14). The majority of individuals, both positive and negative, reported an occupation in the unskilled service sector and more than eighty percent were married.

Table 13. Demographic Characteristics of AMC VCTC Clients by HIV Status

	HIV Positive (n=1,031)		HIV Negative (n=372)	
	Number	%	Number	%
Sex				
Males	634	61.5	234	62.9
Females	397	38.5	138	37.1
Education				
Illiterate	406	39.4	148	39.8
Up to 4 th Std	127	12.3	34	9.1
Up to 8 th Std	224	21.7	73	19.6
SSC	186	18.0	77	20.7
Degree	48	4.7	25	6.7
Post-Graduate Degree	2	0.2	0	0
Missing	38	3.7	15	4.0
Age (years)				
Minimum		0		2
Mean		29.9		30.8
Maximum		65		65
Occupation				
Agriculture	9	0.9	2	0.5
Business	46	4.5	16	4.3
CSW	5	.5	0	0
Employed – private	57	5.5	36	9.7
Employed – public/government	6	.6	0	0
Housewife	244	23.7	90	24.2
Professionals	8	.8	2	0.5
Service Sector – skilled	31	3.0	19	5.1
Service Sector – unskilled	450	43.6	159	42.7
Student	10	1	10	2.7
Transportation	122	11.8	19	5.1
Unemployed	4	0.4	0	0
Missing	39	3.8	19	5.1
Marital Status				
Married	836	81.1	302	81.1
Unmarried	98	9.5	40	10.8
Divorced	17	1.6	6	1.6
Widower	35	3.4	6	1.6
Missing	45	4.4	18	4.8

Figures 6 and 7 describe the reason for clinic visit by HIV status for males and females. For the HIV positive male clients at Andhra Medical College VCTC, 53.7% (338 of 630) of the men listed prolonged illness as the reason for the VCTC visit. Table 14 indicates that 95% (598 of 630) of these men listed multiple (heterosexual) partners as their risk behavior. Among HIV positive female clients, the predominant reported reason for visit was related to their spouse's HIV infection, 48% (191 of 397). Among HIV positive female clients at AMC, 70% (275 of 392) listed blood transfusion as their type of risk behavior (Table 14). Per communication with the AMC VCTC Microbiology Department, concern was expressed that data regarding blood transfusion were not reliable given that the question is generally not directly asked of all clients. The next most common risk behavior reported by HIV positive female clients was heterosexual exposure; the same pattern was seen among HIV negative females.

Figure 6. Reason for AMC VCTC Visit by HIV Status Among Males (n=860)

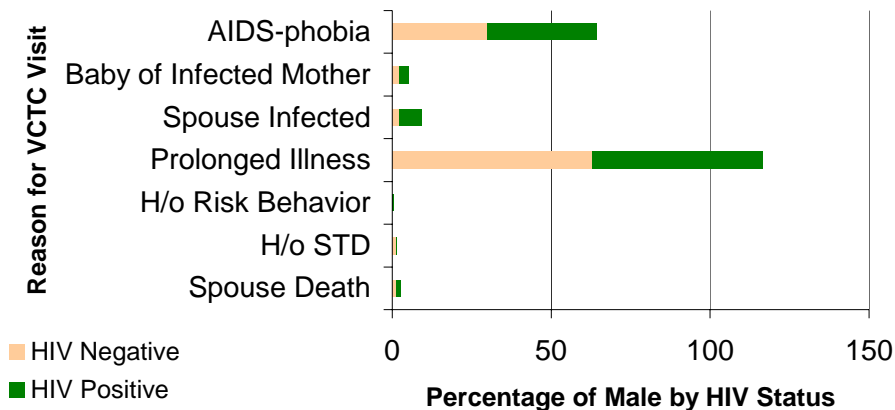


Figure 7. Reason for AMC VCTC Visit by HIV Status Among Females (n=533)

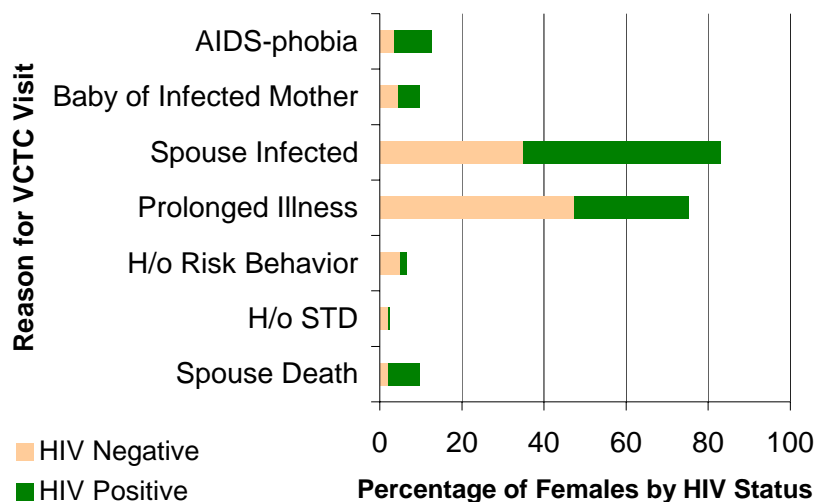


Table 14. AMC VCTC Risk Behavior by Sex and HIV Status

Type of Risk Behavior	HIV Positive (n=1,022)				HIV Negative (n=364)			
	Males		Females		Males		Females	
	Number	%	Number	%	Number	%	Number	%
Heterosexual – Multiple Partners	598	94.9	93	23.7	209	91.7	35	25.7
MSM	1	0.2	0	0	1	0.4	0	0
IDU – Needle Sharing	0	0	0	0	0	0	0	0
History of Blood Transfusion*	10	1.6	275	70.2	5	2.2	93	68.4
Baby of HIV Infected Mother	18	2.9	20	5.1	6	2.6	7	5.1
Needle Stick Injury	1	0.2	2	0.5	1	0.4	1	0.4
Other	1	0.2	1	0.3	0	0	0	0
Unknown	1	0.2	1	0.3	6	2.6	0	0
Total	630	100	392	100	228	100	136	100

*Per communication with the AMC VCTC Microbiology Department, it was expected that the blood transfusion data were not reliable.

B. Anakapalle Area Hospital, VCTC

Overviews

Anakapalle Area Hospital is one of three rural hospitals from which data are included in the epidemiologic profile. Anakapalle is designated as the District Hospital and was built in 2001 approximately 30.5 kilometers from Visakha City. The hospital is one of four government-funded Community Health Centers that provides secondary level care to the district's 3,816,820 people. The Anakapalle VCTC officially opened on June 20, 2002 and the counselor started work in July 2002. Pre-test counseling occurs in a 1:5 ratio of counselor to patients and post-test counseling occurs in a 1:1 ratio. The center maintains three registers: pre- and post-test counseling register; a patient identification (PID) number and address register; and a register with the PID number and HIV test result.

Population

From July 2002 through March 2003, 1,006 individuals were counseled and tested at the Anakapalle Area Hospital VCTC. AP SACS aggregate reports show 118 (12%) of these individuals tested HIV positive. During data abstraction, records were only available for 108 HIV positive cases. Data were collected for the 108 HIV positive individuals as well as for a sample of people testing HIV negative (n=94). The sample of HIV negative individuals were drawn by calculating 10% of the total number of people tested each month, and a corresponding number of HIV negative records were

abstracted. For example, if 100 people were tested for HIV in January, then records from the first 10 HIV negative individuals were abstracted for January.

Analysis

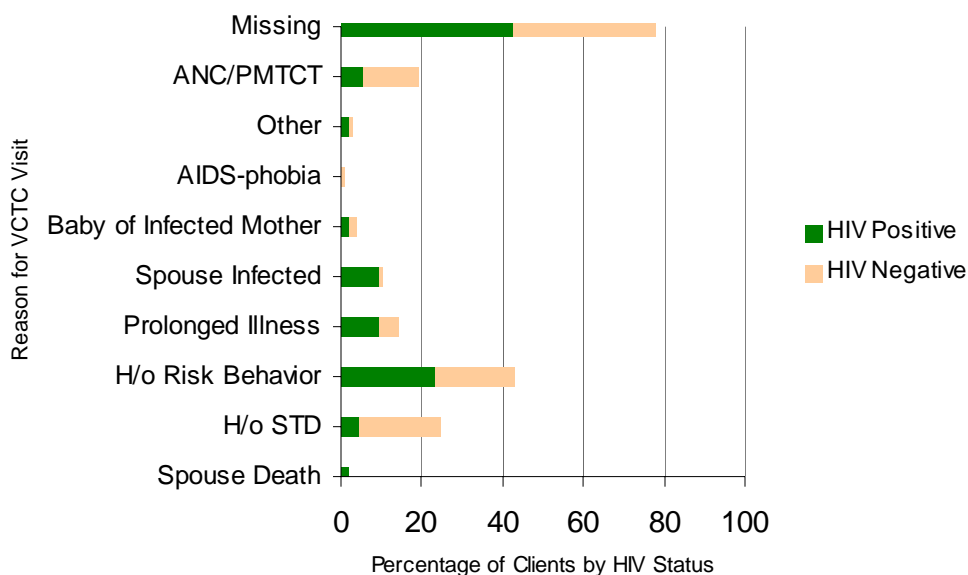
Table 15 shows the sociodemographic characteristics of both the HIV positive clients and the HIV negative sample. The majority of sociodemographic characteristics did not vary by HIV status. The mean age among Anakapalle VCTC patients was 30 years for HIV positive patients and 28 years for HIV negative patients. The number of males and females testing HIV positive was approximately equal. Half of all individuals were illiterate (50.9% of HIV positives, 48.9% of HIV negatives). The largest proportion of HIV positives had an unskilled service sector occupation (30.6%), whereas the largest proportion of HIV negatives, were housewives (37.2%). Nearly three-fourths (73.1%) of all HIV positive cases were married compared to 87.2% of negative clients. Twelve percent of seropositive clients were widowed compared to 1.1% of HIV negative individuals (Table15).

Table 15. Demographic Characteristics of Anapalle Area Hospital VCTC Clients

	HIV Positive (n=108)		HIV Negative (n=94)	
	Number	%	Number	%
Sex				
Males	55	50.9	27	28.7
Females	51	47.2	67	71.3
Missing	2	1.9	-	-
Education				
Illiterate	55	50.9	46	48.9
Up to 4 th Std	10	9.3	17	18.1
Up to 8 th Std	16	14.8	12	12.8
SSC	8	7.4	13	13.8
Degree	3	2.8	5	5.3
Post-Graduate Degree	1	0.9	-	-
Missing	15	13.9	1	1.1
Age Distribution				
Minimum		5		3
Mean		29.9		28.1
Maximum		50		60
Occupation				
Agriculture	12	11.1	18	19.1
Business	7	6.5	4	4.3
CSW	0	0.0	0	0
Employed – unspecified	2	1.9	2	2.1
Employed – private	0	0	0	0
Employed – public/government	0	0	0	0
Housewife	21	19.4	35	37.2
Professionals	3	2.8	0	0
Service Sector – skilled	7	6.5	4	4.3
Service Sector – unskilled	33	30.6	20	21.3
Student	0	0	1	1.1
Transportation	11	10.2	1	1.1
Unemployed	2	1.9	1	1.1
Missing	10	9.3	8	8.5
Marital Status				
Married	79	73.1	82	87.2
Unmarried	8	7.4	9	9.6
Divorced	4	3.7	-	-
Widower	13	12.0	1	1.1
Missing	4	3.7	2	2.1

Data collected on the various sociodemographic variables had a high degree of completeness. Reason for visit and risk behavior data were less complete, 60.9% and 36.7% respectively. Figure 8 shows the reason for VCTC visit by HIV status. The largest proportion of individuals cited prolonged illness as the primary reason for taking an HIV test.

Figure 8. Reason for VCTC Visit by HIV Status, Anakapalle Area Hospital (n=202)



C. Narsipatnam Area Hospital, VCTC

Overview

Narsipatnam Area Hospital is one of three rural hospitals included in the epidemiologic profile. The hospital is one of four government-funded Community Health Centers that provides secondary level care to the district's 3,816,820 people. The VCTC started in July 2002 and is staffed by a medical officer, one counselor, and a laboratory technician. The center offers group pre-test counseling and one-to-one post-test counseling.

Population

AP SACS records showed that 691 individuals were counseled and screened at Narsipatnam Area Hospital during the last fiscal year. Of those tested, 66 (9.6%) were HIV positive. During data abstraction, information was available for 57 positive cases. Individual-level data were abstracted for these cases and for a sample of people who tested HIV negative (n=64). The sample of HIV negative individuals was drawn by calculating 10% of the total number of people tested each month, and a corresponding number of HIV negative records were abstracted. For example, if 100 people were tested for HIV in January, then records from the first 10 HIV negative individuals were abstracted for January.

Analysis

Table 16 describes the sociodemographic characteristics of those who tested HIV positive as well as for the sample of those who tested negative. The average age among HIV positive clients was 26 years and was 24 years for HIV negatives. Fifty-six percent of HIV positives were male and 23% of HIV negative clients were male. The majority of VCTC clients were illiterate: 66.7% of seropositive clients and 82.8% of HIV negative individuals. Over 80% of HIV positive persons were married compared to 95.3% of HIV negative persons.

Both 'risk behavior' and 'reason for visit' variables were of limited use in the Narsipatnam VCTC data. 'Risk behavior' was complete for only 22.3% of the records. Twenty-five of the 27 individuals (92.6%) who answered the question reported heterosexual exposure. While the overall degree of completeness was high for 'reason for visit,' more than half (53%) of all responses were coded as 'other.'

Table 16. Demographic Characteristics of Narsipatnam Area Hospital VCTC Clients

	HIV Positive (n=57)		HIV Negative (n=64)	
	Number	%	Number	%
Sex				
Males	32	56.1	15	23.4
Females	25	43.9	49	76.6
Education				
Illiterate	38	66.7	53	82.8
Up to 4 th Std	7	12.3	5	7.8
Up to 8 th Std	2	3.5	3	4.7
SSC	6	10.5	3	4.7
Degree	1	1.8	0	0
Post-Graduate Degree	0	0	0	0
Missing	3	5.3	0	0
Age Distribution				
Minimum		4		12
Mean		26.2		24.5
Maximum		40		50
Occupation				
Agriculture	12	21.1	9	14.1
Business	5	8.8	4	6.3
CSW	0	0	0	0
Employed – unspecified	0	0	0	0
Employed – private	0	0	0	0
Employed – public/government	0	0	0	0
Housewife	21	36.8	42	65.6
Professionals	0	0	1	1.6
Service Sector – skilled	1	1.8	0	0
Service Sector – unskilled	8	14.0	6	9.4
Student	0	0	0	0
Transportation	4	7.0	0	0
Unemployed	0	0	0	0
Missing	6	10.5	2	3.1
Marital Status				
Married	50	87.7	61	95.3
Unmarried	4	7.0	3	4.7
Divorced	0	0	0	0
Widower	0	0	0	0
Missing	3	5.3	0	0

5. 2003 SENTINEL SURVEILLANCE DATA

Overview

Unlinked and anonymous HIV sentinel surveillance takes place annually from August through October throughout India. The sentinel surveillance program is nationally coordinated by the National AIDS Control Organization (NACO) and is regionally coordinated (within AP) by the Indian Institute of Health and Family Welfare. Each year, data are collected from all districts in antenatal care clinics (ANC) and in sites treating sexually transmitted diseases (STD). In Andhra Pradesh, the original data collection forms are sent by the sites to AP SACS and then forwarded to NACO for analysis and report preparation.

The 2003 round of sentinel surveillance was the seventh year of the program. In Andhra Pradesh, NACO identified eight STD sites and 14 ANC sites for the study. AP SACS subsequently identified an additional eleven sites (3 STD and 9 ANC) for inclusion in the survey. 2003 sentinel surveillance sites included four sites in Visakhapatnam. Analyses of the 2002 sentinel surveillance data are available in **Appendix E**.

The general sampling methodology recommended for all sentinel survey sites includes either 1), collecting consecutive blood samples until the predetermined sample size is reached or 2), taking all samples consecutively over the eight-week survey period provided the minimum sample size is obtained.

Unlinked anonymous HIV testing is conducted on all blood samples. For areas with HIV seroprevalence >10%, HIV testing is conducted using one ELISA or rapid/simple assay. Serum that is reactive is considered HIV positive without additional confirmatory testing. For areas with an HIV seroprevalence of 5-10%, any initially reactive samples are tested with a second ELISA or rapid/simple assay that has a higher specificity based on a different antigen preparation. Serum that tests positive initially and negative during the second test are considered antibody negative. STDs are diagnosed syndromically.

Population

The four 2003 sentinel surveillance sites in Visakhapatnam District included an STD clinic, female sex worker (FSW) screening program, and two antenatal clinics. The sample size included 250 patients from the STD clinic, 250 FSWs, and 400 patients from each of the antenatal clinics.

The Andhra Medical College STD Clinic served as the Visakhapatnam 2003 STD sentinel surveillance site. AMC is a medical teaching hospital located in Visakha City. The facility attracts individuals from across the district and is also a referral center for the four rural Community Health Centers. According to AP SACS records, a total of 6,827 STD patients were seen at the AMC STD Clinic between April 2002 and March 2003 (average 569 patients per month). This number includes all individuals who came to the STD clinic for services, whether they had an STD or not. Some individuals did

not have an STD, but came to the AMC STD Clinic for HIV screening. These individuals were included in the total figures.

In 2003, the HIV testing results of female sex workers (FSW) were added as another component of the sentinel surveillance survey. AMC coordinated HIV testing for this population. In Visakhapatnam, FSWs primarily resided in urban areas and had very low levels of education.

The Anakapalle Area Hospital served as one of the two Visakhapatnam antenatal clinic recruitment sites for the 2003 sentinel survey. Anakapalle is designated as the District Hospital in Visakhapatnam and is one of four Community Health Centers that provides secondary level care to a primarily rural population. New ANC client registration data were available for four months during the 2002 fiscal year. From November 22, 2002 to March 25, 2003, an average of 271 women registered as new ANC clients each month.

The Aganampudi Area Hospital served as the second Visakhapatnam antenatal clinic recruitment site for the 2003 sentinel survey. The Aganampudi Area Hospital is a Community Health Center and serves a primarily rural population in Gajuwaka Mandal (Figure 2). The first year that ANC sentinel surveillance data was collected at this site was 2003.

Analysis

Aggregate statewide sentinel surveillance data were available from 1998 through 2003. Consolidated statewide data on HIV seropositivity in Andhra Pradesh are graphed for ANC and STD data. Seropositivity in ANC sites varied little over the 5-year period. Seropositivity in STD sites varied more widely during this same period (Figure 9). From 1998-2002, a higher proportion of patients at the Visakhapatnam STD sentinel surveillance site were HIV positive than at all Andhra Pradesh sites combined. (Figure 10).

Figure 9. STD clinic and Antenatal Clinic HIV Infection Trends in Andhra Pradesh Aggregate Sentinel Surveillance Data, 1998-2002

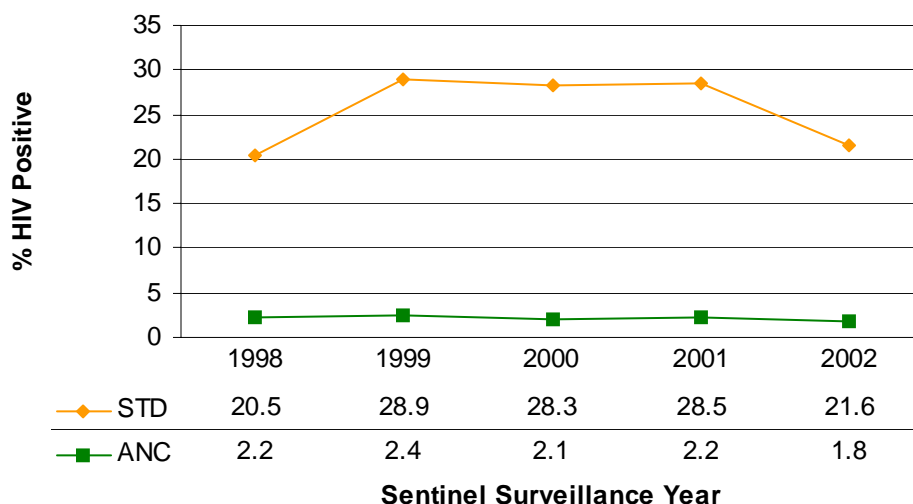
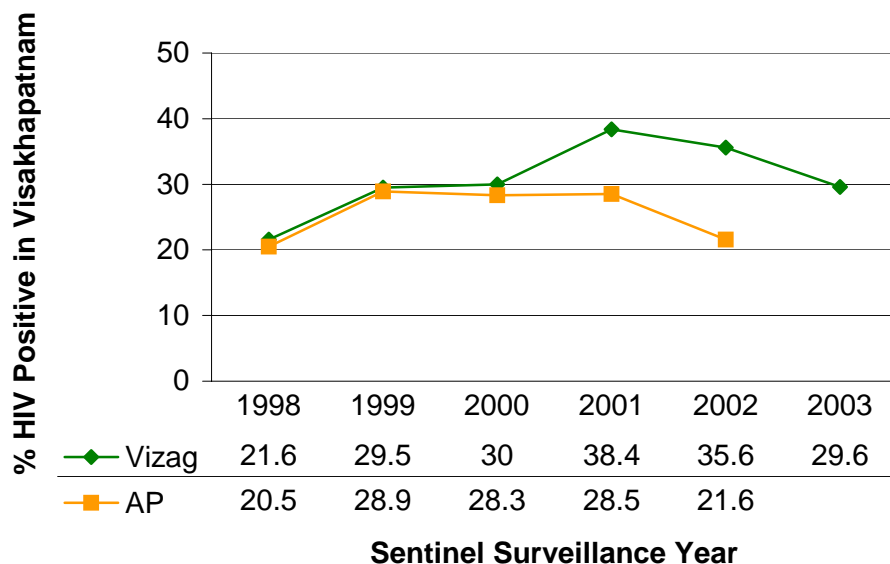


Figure 10. Trends in Visakhapatnam District STD Sentinel Surveillance Data Compared to Statewide Trends, 1998-2003) *note: statewide data not available for 2003.



A. 2003 STD Sentinel Surveillance Survey Data

Visakhapatnam District sentinel STD surveillance data for 2003 were available in aggregate format. Tables 17, 18, 19 and 20 describe the sociodemographic characteristics and geographic distribution of individuals who tested HIV positive in the survey. It should be noted that not all sentinel surveillance data discussed are presented in the tables, but can be derived from them. Percentages were rounded to

the nearest tenth of a percentage point. Among the 250 person STD clinic sample, 74 were HIV positive (29.6%). Thirty-eight (51%) of those testing positive were male and 36 (49%) were female. More than half (68.9%: 51 of 74) of HIV positive individuals reported living in an urban area. However, proportionally more rural residents were HIV positive than urban residents (35.9% versus 27.4%) (Table 18). Literacy data showed overall a majority of those who were HIV positive had less than a 5th grade education (61.9%) (Table 19). More than half of HIV positive males were classified as agriculture/unskilled workers (55.2%: 21 of 38) and half of HIV positive females were classified as housewives (50.0%: 18 of 36) (Table 20).

Table 17. 2003 STD Sentinel Surveillance, Age and Sex Distribution*

Age Group Years	Number (%) HIV Positive		
	Male	Female	Total
< 20	-	1 (9.1%)	1 (5.0%)
20-29	10 (15.9%)	22 (38.6%)	32 (26.7%)
30-44	25 (48.1%)	11 (34.4%)	36 (42.9%)
> 45	3 (20.0%)	2 (18.2%)	5 (19.2%)
Total	38 (27.3%)	36 (32.4%)	74 (29.6%)

*Source: 2003 Sentinel Surveillance AP SACS Report

Table 18. 2003 STD Sentinel Surveillance, Locale Distribution*

Locale	Number (%) HIV Positive		
	Male	Female	Total
Urban	30 (26.8%)	21 (28.4%)	51 (27.4%)
Rural	8 (29.6%)	15 (40.5%)	23 (35.9%)
Total	38 (27.3%)	36 (32.4%)	74 (29.6%)

*Source: 2003 Sentinel Surveillance AP SACS Report

Table 19. 2003 STD Sentinel Surveillance, Literacy Status*

Literacy Status	Number (%) HIV Positive		
	Male	Female	Total
Illiterate	14 (42.4%)	23 (35.4%)	37 (37.8%)
Up to 5th grade	4 (19.1%)	3 (37.5%)	7 (24.1%)
Up to 12th grade	18 (25.7%)	7 (21.9%)	25 (24.5%)
Graduate and above	2 (13.3%)	3 (50.0%)	5 (23.8%)
Total	38 (27.3%)	36 (32.4%)	74 (29.6%)

*Source: 2003 Sentinel Surveillance AP SACS Report

Table 20. 2003 STD Sentinel Surveillance, Occupation*

Age Group	Number (%) HIV Positive			
	Years	Male	Female	Total
Agriculture/Unskilled Worker		21 (33.3%)	15 (44.1%)	36 (37.1%)
Truck/Taxi/Auto/Driver/Cleaner		7 (28.6%)	-	6 (27.3%)
Industrial & Factory Worker		3 (50.0%)	-	3 (50.0%)
Hotel Staff		-	-	-
Service		2 (7.7%)	2 (100%)	4 (14.3%)
Business		1 (50.0%)	-	1 (25.0%)
Unemployed		5 (45.5%)	1 (14.3%)	6 (33.3%)
Student		-	-	-
Housewife		-	18 (28.6%)	18 (28.6%)
Total		38 (27.3%)	36 (32.4%)	74 (29.6%)

*Source: 2003 Sentinel Surveillance AP SACS Report

B. 2003 FSW Sentinel Surveillance Survey Data

A total of 250 female sex workers (FSW) were tested during the 3-month data collection period. Of those tested, 12.8% (n=32) were positive for HIV. The majority (87.5%) of the FSWs who tested positive resided in an urban area, and 90.6% of those who tested positive for HIV reported being illiterate (Table 21).

Table 21. 2003 FSW Sentinel Surveillance Data*

FSW Demographics	Number (%) HIV Positive
Age (years)	
< 20	1 (4.3%)
20-29	13 (20.3%)
30-44	18 (12.4%)
> 45	-
Locale	
Urban	28 (12.6%)
Rural	4 (14.3%)
Literacy	
Illiterate	29 (15.7%)
Up to 5 th grade	2 (3.6%)
Up to 12 th grade	1 (11.1%)
Graduate and above	-

*Source: 2003 Sentinel Surveillance AP SACS Report

C. 2003 ANC Sentinel Surveillance Survey Data, Anakapalle Area Hospital

Out of four hundred women sampled at the Anakapalle antenatal clinic, four were HIV positive (1.0%). Because of the small number of HIV positive individuals, analyses are of limited use. Tables 22 through 25 describe the sociodemographic characteristics and geographic distribution of women who participated in the survey.

Table 22. 2003 ANC Sentinel Surveillance, Anakapalle, Age and Sex Distribution*

Age Group	Number Tested	Female	
		Number HIV+	Percentage HIV+
Years			
< 20	108	1	0.9
20-29	274	3	1.1
30-44	18	-	-
> 45	-	-	-
Total	400	4	1.0

*Source: 2003 Sentinel Surveillance AP SACS Report

Table 23. 2003 ANC Sentinel Surveillance, – Anakapalle, Locale Distribution*

Locale	Number Tested	Female	
		Number HIV+	Percentage HIV+
Urban	58	1	1.7
Rural	342	3	0.9
Total	400	4	1.0

*Source: 2003 Sentinel Surveillance AP SACS Report

Table 24. 2003 ANC Sentinel Surveillance, Anakapalle, Literacy Status*

Literacy Status	Number Tested	Female	
		Number HIV+	Percentage HIV+
Illiterate	193	1	0.5
Literate & till 5 th	79	1	1.3
Till 12 th	120	2	1.7
Graduate & Above	8	-	-
Total	400	4	1.0

*Source: 2003 Sentinel Surveillance AP SACS Report

Table 25. 2003 ANC Sentinel Surveillance, Anakapalle, Occupation of Spouse*

Occupation	Number Tested	Female	
		Number HIV+	% HIV+
Agriculture/Unskilled Worker	323	3	0.9
Truck/Taxi/Auto/Driver/Cleaner	31	-	-
Industrial & Factory Worker	7	-	-
Hotel Staff	4	-	-
Service	16	1	6.3
Business	15	-	-
Unemployed	4	-	-
Student	-	-	-
Total	400	4	1.0

*Source: 2003 Sentinel Surveillance AP SACS Report

D. 2003 ANC Sentinel Surveillance Survey Data, Aganampudi Area Hospital

Out of four hundred women sampled at the Aganampudi antenatal clinic, nine were HIV positive (2.3%). Because of the small number of HIV positive individuals, analyses are of limited use. Tables 26 through 29 describe the sociodemographic characteristics and geographic distribution of women who participated in the survey.

Table 26. 2003 ANC Sentinel Surveillance, Aganampudi, Age and Sex Distribution*

Age Group	Number Tested	Female	
		Number HIV+	Percentage HIV+
Years			
< 20	242	4	1.7
20-29	154	5	3.2
30-44	4	-	-
> 45	-	-	-
Total	400	9	2.3

*Source: 2003 Sentinel Surveillance AP SACS Report

Table 27. 2003 ANC Sentinel Surveillance, Aganampudi, Locale Distribution*

Locale	Number Tested	Female	
		Number HIV+	Percentage HIV+
Urban	199	6	3.0%
Rural	201	3	1.5%
Total	400	9	2.3

*Source: 2003 Sentinel Surveillance AP SACS Report

Table 28. 2003 ANC Sentinel Surveillance, Aganampudi, Literacy Status*

Literacy Status	Number Tested	Female	
		Number HIV+	Percentage HIV+
Illiterate	120	2	1.7
Literate & till 5 th	99	4	4.0
Till 12 th	173	3	1.7
Graduate & Above	8	-	-
Total	400	9	2.3

*Source: 2003 Sentinel Surveillance AP SACS Report

Table 29. 2003 ANC Sentinel Surveillance, Aganampudi, Occupation of Spouse*

Occupation	Number Tested	Female	
		Number HIV+	% HIV+
Agriculture/Unskilled Worker	187	3	1.6
Truck/Taxi/Auto/Driver/Cleaner	69	1	1.4
Industrial & Factory Worker	68	2	2.9
Hotel Staff	8	1	12.5
Service	43	1	2.3
Business	25	1	4.0
Unemployed	-	-	-
Student	-	-	-
Total	400	9	2.3

*Source: 2003 Sentinel Surveillance AP SACS Report

6. CARE AND SUPPORT CENTER DATA

A. Green Vision

Overview -

Patients seeking government-sponsored care and treatment visit local public health centers, area hospitals, and medical colleges. Patients may also seek care at private sector organizations such as Green Vision, an NGO providing home-based care and support to persons with HIV/AIDS.

Analysis

During the 2002 fiscal year, Green Vision had 133 new HIV positive patients. Table 30 describes the sociodemographic characteristics of these patients. Slightly more than half (56.4%) of Green Vision patients were male. More than three quarters (76.7%) of Green Vision patients had an HIV-infected spouse (Table 30). Among males, 69.3% (52 out of 75) of individuals had an infected spouse and among females, 86% (50 out of 58) reported an infected spouse.

Green Vision does not provide antiretroviral drugs, but does provide medication to treat HIV/AIDS-related conditions, including opportunistic infections, body aches, and diarrhea. Out of 133 clients, 124 (93.2%) received some form of medical treatment. Specific medical diagnoses were generally not recorded although symptoms (e.g. fever, body ache, cough) were. Seven (5.3%) individuals had tuberculosis.

Table 30. Characteristics of Green Vision HIV Positive Patients

	Green Vision Patients (n=133)	
	Number	%
Sex		
Males	75	56.4
Females	58	43.6
Age (years)		
Minimum	2	
Mean	29.1	
Maximum	56	
Occupation		
Agriculture	2	1.5
Business	16	12
CSW	6	4.5
Employed – unspecified	0	0
Employed – private	0	0
Employed – public/government	1	0.8
Housewife	21	15.8
Professionals	0	0
Service Sector – skilled	18	13.5
Service Sector – unskilled	39	29.3
Student	2	1.5
Transportation	19	14.3
Unemployed	6	4.5
Missing	3	2.3
Spouse Infected		
Yes	102	76.7
No	18	13.5
Unmarried	10	7.5
Missing	3	2.3

Question 3. What are the indicators of HIV/AIDS infection risk in Visakhapatnam District?

OVERVIEW

The preceding section addressed the prevalence of HIV infection in individuals seeking clinic services in a variety of health care settings, in which HIV status is routinely or systematically ascertained. This section examines direct and indirect measures of risk behaviors in select groups at risk for acquiring HIV infection. Direct measures of risk provide information about risk behavior that is directly associated with HIV transmission. Indirect measures do not directly describe HIV risk behaviors; rather, they are possible HIV risk behaviors that may need further investigation.

Data were collected from the AMC STD clinic. STDs indicate unprotected sex, which is a risk factor for HIV. The most commonly diagnosed STDs were balanoposthitis and herpes, an ulcerative STD. Almost half (48%, 342 of 713) of clinic clients reported knowing their HIV status; of these individuals, 26% (89 of 342) reported being seropositive. For both men and women, having symptoms was one of the main reasons for a clinic visit. For men, the primary reason for the STD clinic visit was HIV screening.

Data from the 2001 Behavioral Surveillance System describe HIV-related knowledge and behaviors for those surveyed in Andhra Pradesh and other states in India. Data specific to Visakhapatnam were not available. While both the general population and high risk populations in AP demonstrated a higher level of HIV-related knowledge than some other states in South India, this increased knowledge did not appear to translate into behaviors that reduced risk for HIV, e.g. number of non-regular sex partners or condom use. The largest proportion of those surveyed from high risk populations perceived themselves to be at low risk for HIV.

ANALYSES OF DATA FROM INDIVIDUAL SOURCES

A. Andhra Medical College (King George Hospital) Sexually Transmitted Disease Clinic

Overview

STD data include information abstracted from the STD clinic at Andhra Medical College from April 2002 to March 2003. Data were not abstracted from the area hospitals (Narsipatnam and Anakapalle) because records at these sites did not include laboratory confirmed STD diagnoses and the number of records was relatively small (3% of the cumulative records from all the three sites).

Population

AP SACS records show a total of 6,827 STD clinic visits to the AMC STD Clinic between April 2002 and March 2003. These visits include all individuals who sought services at the STD clinic, whether or not they were diagnosed with an STD. Some

individuals did not have an STD, but came for HIV screening and were subsequently referred to the AMC VCTC. These individuals are included in the 6,827.

Due to a large volume of records, data were abstracted from only one-third of STD patient records. Within the STD clinic, data were stored separately for male and female STD patients. An attempt to sample every third record was made, however sampling was not uniform for records on males. At times, every second record was sampled, particularly when the record belonged to an HIV positive individual; consequently, men who were infected with HIV were over-sampled. During data collection, a total of 713 records were abstracted (482 males and 231 females), which meant the total number of available records was approximately 2,100 records.

Analysis

Table 31 describes the sociodemographic characteristics of individuals who attended the AMC STD Clinic. The majority of clinic patients were male (67.6%). Less than one-fifth of the population had completed 9-10th standard (19.5%) and a large proportion of the clinic population was illiterate (41.2%). Unskilled service sector jobs (21.3%) and housewives (22.4%) were the most commonly reported occupations. The majority of clinic patients were married (82.7%).

Table 31. Demographic Characteristics of AMC STD Clinic Clients (n=713)

	Number	%
Sex		
Males	482	67.6
Females	231	32.4
Education		
Illiterate	294	41.2
1 st -4 th	18	2.5
5 th -8 th	133	18.7
9 th -10 th	139	19.5
Diploma/Degree	63	8.8
Intermediate	41	5.8
Post Graduate	12	1.7
Missing/Other	13	1.8
Age (years)		
Minimum		7
Mean		29.9
Maximum		66
Occupation		
Agriculture	40	5.6
Business	40	5.6
CSW	8	1.1
Employed – unspecified	8	1.1
Employed – private	6	0.8
Employed – public/government	13	1.8
Housewife	152	21.3
Professionals	12	1.7
Service Sector – skilled	73	10.2
Service Sector – unskilled	160	22.4
Student	16	2.2
Transportation	61	8.6
Unemployed	116	16.3
Missing	8	1.1
Marital Status		
Married	590	82.7
Unmarried	122	17.1
Missing	1	0.1

Male STD patients primarily reported ‘STD symptoms’ (31.6%) or ‘seeking HIV testing’ (35.4%) as the reason for their visit (Figure 11). A large proportion of female patients (42.0%) reported symptoms as the reason for their STD clinic visit, followed by HIV-related factors (cumulative percentage 31.1%) (for example, spouse is HIV infected [15.1%], spouse died of HIV/AIDS [5.5%], or seeking HIV testing [10.5%]) as the reason for their visit (Figure 12).

Figure 11. Reason for Visit to AMC STD Clinic Among Male Clients (n=316)

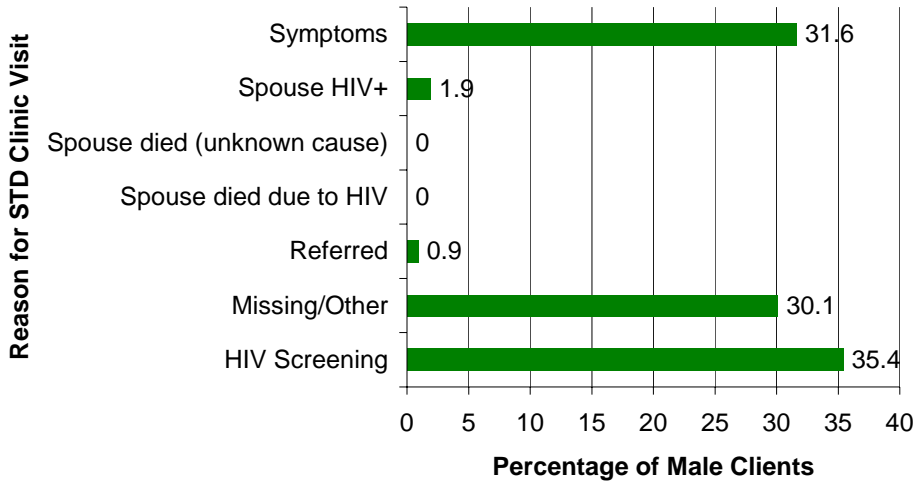
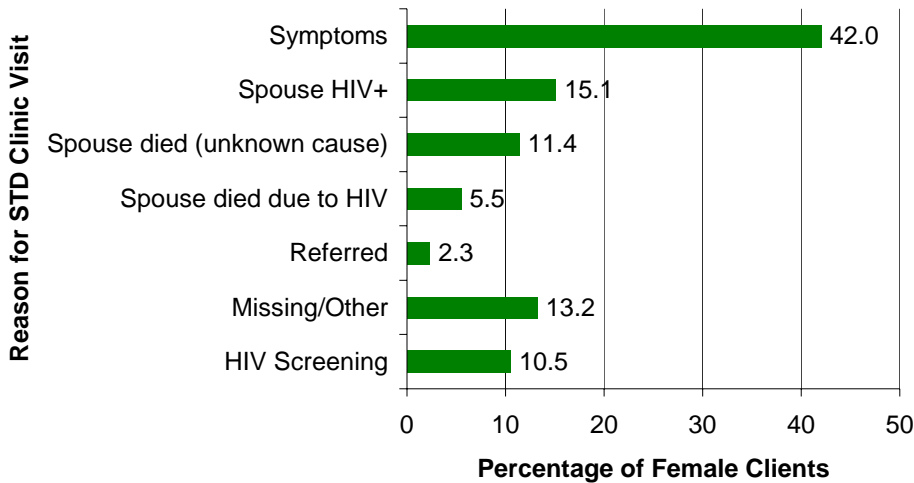


Figure 12. Reason for Visit to AMC STD Clinic Among Female Clients (n= 219)



Risk information was not a standard part of the STD case card filled out for each client and therefore was not available for 46% of patients. Among the 385 patients with an identified risk behavior, 72.7% (280 of 385) cited extra marital exposure, followed by 'spouse infected [with HIV]', 16.4%, or 63 of 385) (Table 32).

Table 32. Risk Information Among AMC STD Clinic Population* (n=713)

Risk Behavior	Number	%
Extra Marital Exposure	280	39.3
Spouse infected	63	8.8
Unprotected Sex	19	2.7
MSM	10	1.4
Commercial Sex Worker	9	1.3
No Identified Risk	3	0.4
Needle Stick	1	0.1
Not available	328	46.0
Total	713	100.0

*Risk information was not a uniformly collected variable since the indicator was not listed on the STD card, and was collected at the initiative of the medical social worker.

The HIV status of patients referred from the AMC STD Clinic to the VCTC was not uniformly collected since there was not a feedback system in place to inform the STD clinic of a patient's test results. Data on HIV status were available for individuals who were aware of their status and reported it to the medical social worker. Forty-eight percent of the sampled individuals (342 of 713) self-reported their HIV status; 89 reported being seropositive and 253 reported being HIV negative.

Table 33 describes STD diagnoses by HIV status for STD clinic patients with an STD diagnosis (n=321). Note that more than half of individuals sampled did not have an STD (392 of 713) and were therefore not included in the table. Among self-reported HIV positive males (n=53), 30.2% were diagnosed with balanoposthitis and 20.8% with genital warts. Among self-reported HIV positive females (n=36), 36.1% were diagnosed with herpes and 25% with Candidiasis. Among self-reported HIV negative clients (n=26), 34.6% were diagnosed with balanoposthitis and 26.9% with herpes. Self-reported HIV negative females (n=13) were diagnosed with herpes (23.1%) and another 23.1% with warts.

A little over half (52.0%) of clinic attendees diagnosed with an STD, reported that they did not know their HIV status (371 of 713). Among these individuals with unknown serostatus males (n=125) were most commonly diagnosed with balanoposthitis (39.2%) followed by gonorrhea (16.8%), warts (11.2%), and herpes (8.8%); and females (n=67) were diagnosed with herpes (30.9%), followed by Candidiasis (25%), and cervicitis (17.6%) (Table 33).

Table 33. STD Diagnoses by Self-Reported HIV Status* Among AMC STD Clinic Population

STD Diagnoses (n=320)	HIV Positive		HIV Negative		HIV Status Unknown		Total
	Male	Female	Male	Female	Male	Female	
Balanoposthitis	16	-	9	-	49	-	74
Candidiasis	8	9	1	2	2	17	39
Cervicitis	-	4	-	1	-	12	17
Chlamydia	-	-	-	-	-	1	1
Donovanosis	-	-	-	-	-	3	3
Gonorrhea	3	-	-	2	21	2	28
Herpes	5	13	7	3	11	21	60
Lymphogranularum veneris	-	1	-	-	5	1	7
Molluscum contagiosum	2	2	-	-	4	1	9
Non-gonococcal Urethritis	-	-	3	-	3	-	6
Scabies	1	-	1	-	6	-	8
Syphilis	1	1	-	1	2	-	5
Tinea cruris	5	-	-	-	6	-	11
Trichomonal vaginitis	-	1	-	1	-	2	4
Ulcer	1	-	1	-	2	2	6
Warts***	11	5	4	3	14	5	42
Total	53	36	26	13	125	67	

*Table only includes information on 320 individuals since not all STD clinic patients were diagnosed with an STD.

**HIV status was self-reported and was not a uniformly collected variable since clients were referred to the AMC VCTC for an HIV test and there was not a reporting system in place to inform the STD clinic of a client's test results.

***Includes human papilloma virus (HPV) and *Condylomata acuminata*

B. Behavioral Surveillance System (BSS) Data – General Population and Targeted High Risk Population (CAPS)

Overview

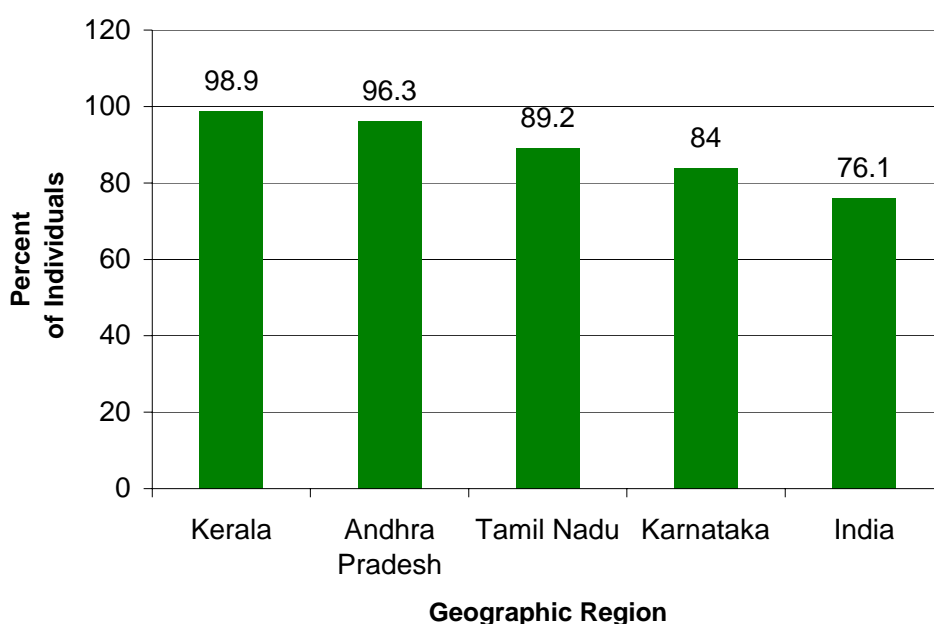
The Behavioral Surveillance System survey was conducted in 2001 for thirty-two states and union territories across India. The target population for the BSS was the general population and included men and women between the ages of 15-49 years from urban and rural areas. In addition to the general population BSS, a targeted BSS was conducted in selected states, including Andhra Pradesh, for high-risk populations, including non-brothel based female sex workers and clients of sex workers.

Aggregate statewide figures and tables created by NACO were available for Kerala, Andhra Pradesh, Tamil Nadu, and Karnataka and provide some information on the general population's HIV/AIDS-related knowledge and behaviors in Southern India.

Analysis - BSS General Population

Data from the general population BSS showed that AP generally fared better on HIV/AIDS awareness-related items than the cumulative country sample. Additionally, when the general population BSS data was stratified by state, AP showed higher percentages of HIV/AIDS-related knowledge and awareness compared to its neighboring states (Kerala, Karnataka, and Tamil Nadu) (Figure 13, Tables 34 and 35). Data from the general population BSS showed that 96.3% of individuals surveyed in Andhra Pradesh had heard of HIV compared to 76.1% of all Indians. Forty-five percent of AP males and 37% of AP females were aware of the link between STDs and HIV compared to 23% of males countrywide and 19% of females countrywide (Figure 14).

Figure 13 Percent of General Population in Southern India That Have Heard of HIV, 2001 BSS*



*Source: National AIDS Control Organization

Table 34. Knowledge of HIV Transmission Routes Among General Population in Southern India, 2001 BSS*

	Kerala	Andhra Pradesh	Tamil Nadu	Karnataka	India
Mother to Unborn Child	88	84	81	77	67
Breastfeeding	75	68	73	66	54
Blood Transfusion	96	91	83	81	73
Sharing Infected Needles	95	88	78	78	71
Sexual Contact	98	85	73	78	71

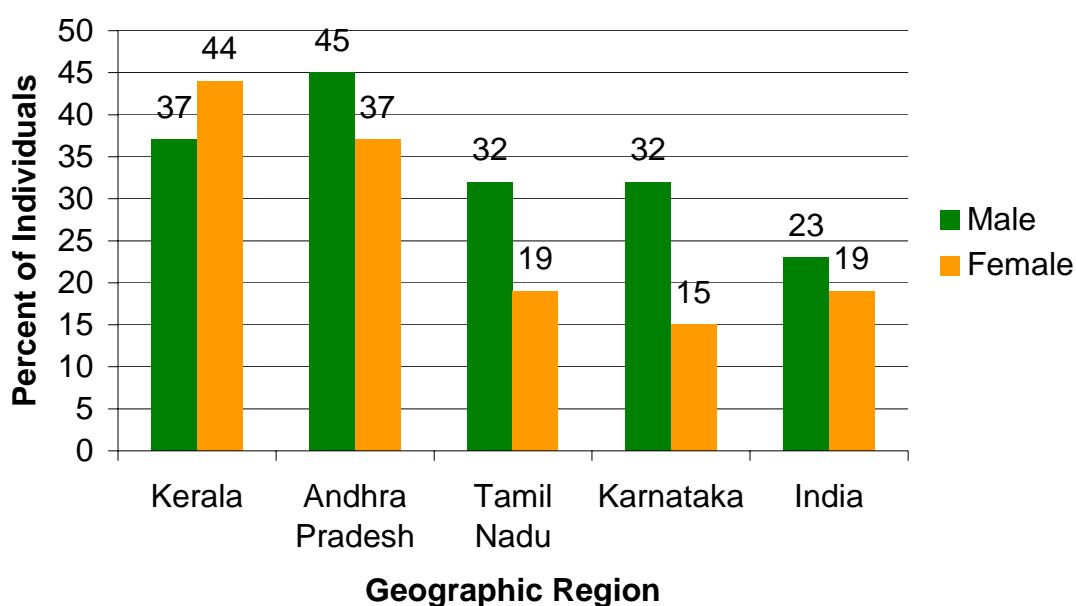
*Source: National AIDS Control Organization

Table 35. Knowledge of Prevention Strategies Among General Population in Southern India, 2001 BSS*

	Kerala	Andhra Pradesh	Tamil Nadu	Karnataka	India
1. Consistent Condom Use	77	62	59	57	59
2. One Faithful, Uninfected Partner	78	68	71	66	57
3. Aware of Both 1 and 2	62	51	51	46	47
4. Sexual Abstinence	95	88	78	78	71

*Source: National AIDS Control Organization

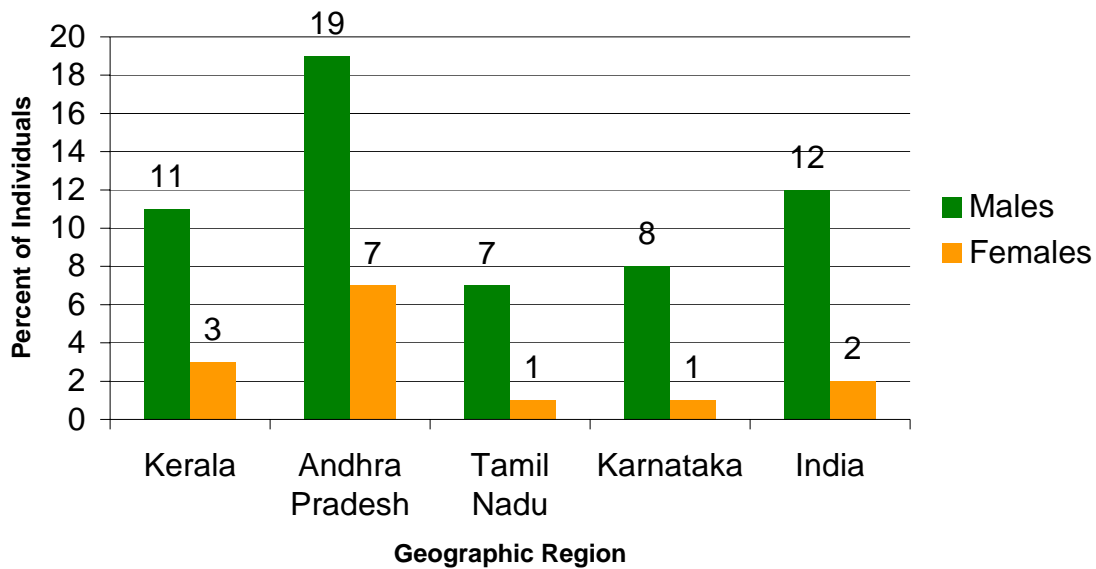
Figure 14. Knowledge of Linkage between STD and HIV Among General Population, 2001 BSS*



*Source: National AIDS Control Organization

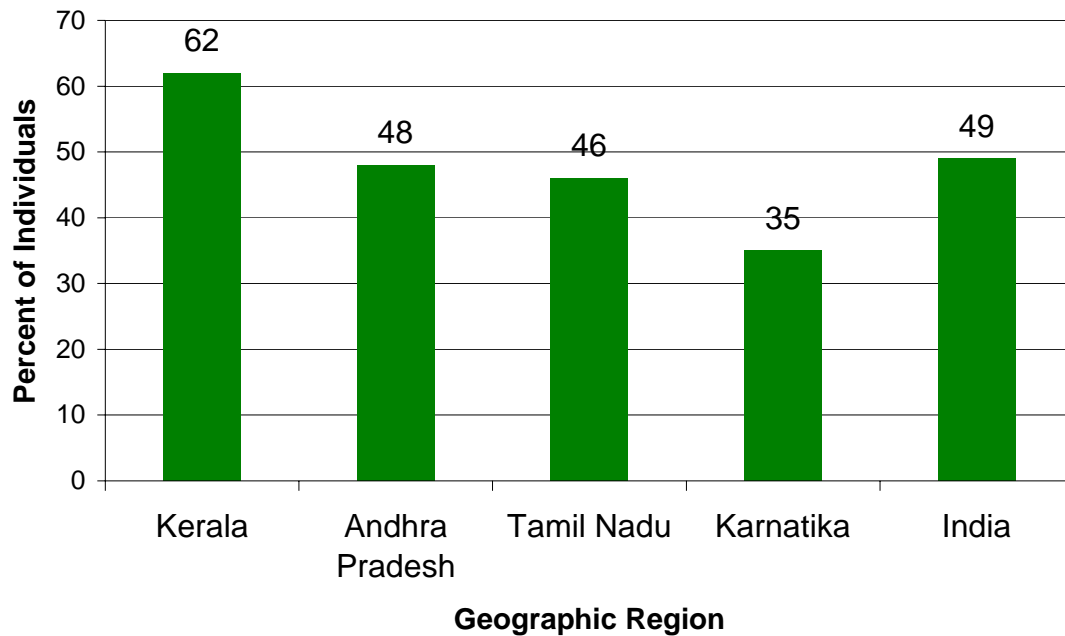
Andhra Pradesh had the highest percentage of survey respondents with non-regular sexual partners (NRP) compared to both the national percentage and the neighboring states, indicating a potentially higher level of risky behavior. Nineteen percent of surveyed AP males and 7% of surveyed AP females reported a NRP compared to countrywide figures of 12% and 2% respectively (Figure 15). Forty-eight percent of AP individuals surveyed reported condom use during the last NRP sex, similar to the percent demonstrated by the country as a whole (Figure 16).

Figure 15. Percentage Self Reporting Non Regular Sexual Partners, 2001 BSS*



*Source: National AIDS Control Organization

Figure 16. Percentage Reporting Condom Use with Last Non Regular Sexual Partner, 2001 BSS*



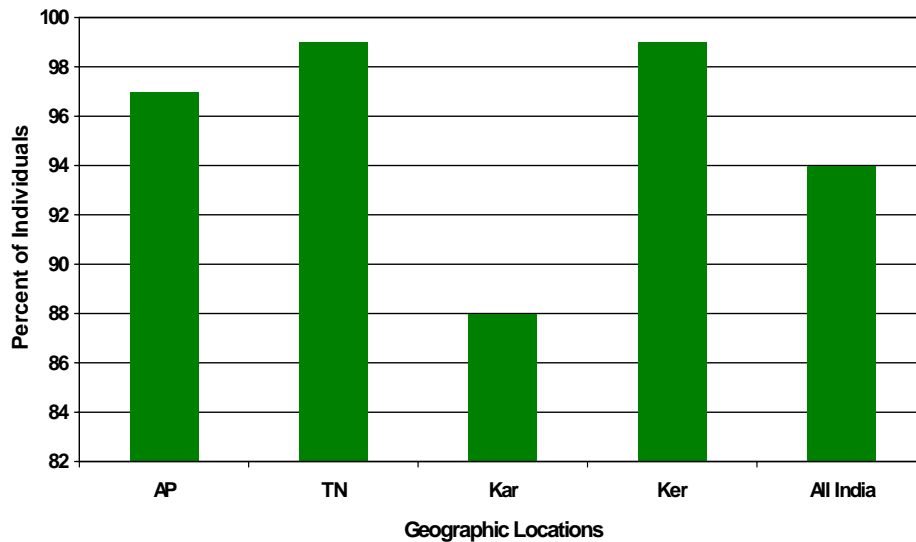
*Source: National AIDS Control Organization

Analysis - BSS High Risk Population

The targeted BSS collected information from high-risk populations, including non-brothel based female sex workers and clients of sex workers. Aggregate statewide data were available from AP SACS and are presented below for AP and neighboring Karnataka, Kerala, Tamil Nadu, and for India overall.

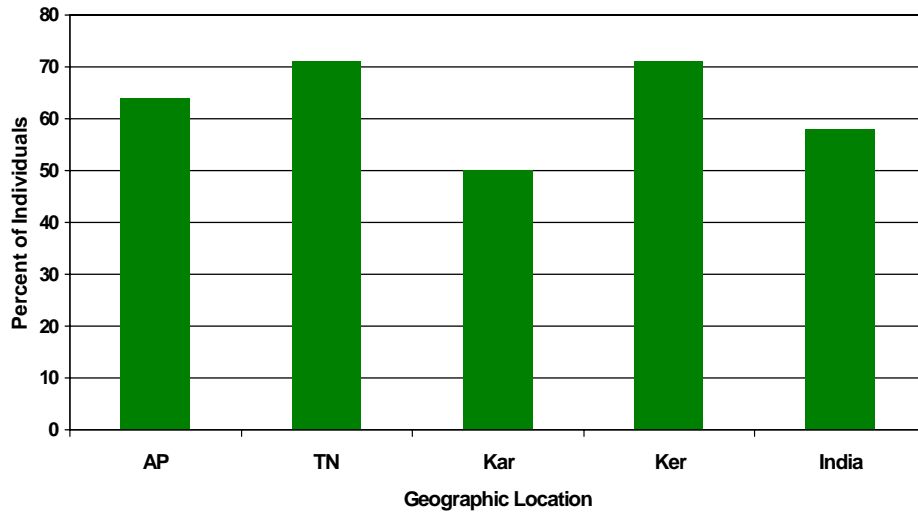
The majority of the high-risk population surveyed was aware of HIV/AIDS; greater than 96% for AP compared to 94% for India overall (Figure 17). More than 60% of female sex workers questioned in AP were aware that a healthy looking person might be HIV-infected (Figure 18). In AP, most female sex workers reported that resistance was the reason for not using a condom with her last paying client. Compared to other states and to the national percentage, AP sex workers were more likely to report that access was a barrier to condom use, as was not feeling the need to use a condom (Figure 19). The majority of sex workers felt that they were at low or no risk for HIV infection (Figure 20). In terms of seeking care for STDs, the majority of AP sex workers indicated that they would seek care from a private clinic followed by a government clinic (Figure 21).

Figure 17. Percentage of High Risk Individuals that had Ever Heard of HIV/AIDS, 2001 BSS Among High Risk Population*



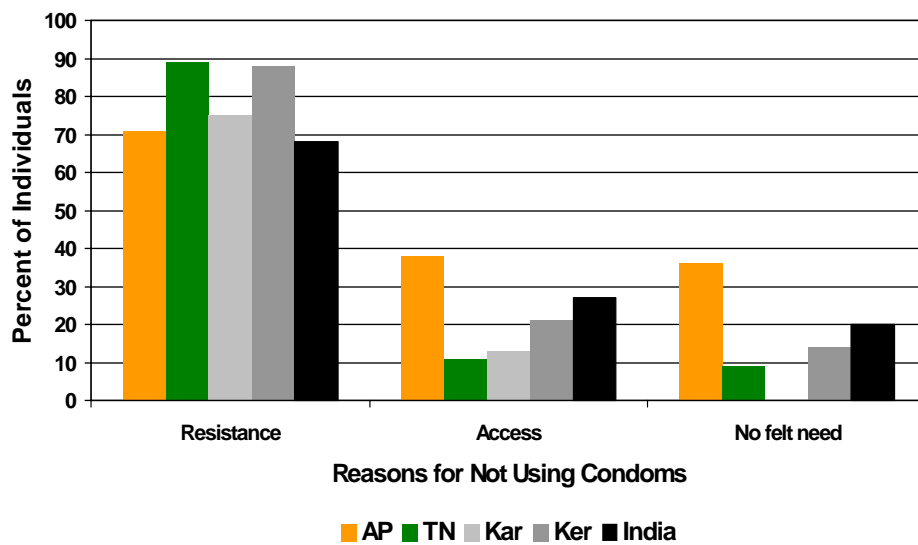
*Source: Andhra Pradesh State AIDS Control Society

Figure 18. Percentage of Female Sex Workers that are Aware that a Healthy Looking Person can be HIV Infected, 2001 BSS Among High Risk Population*



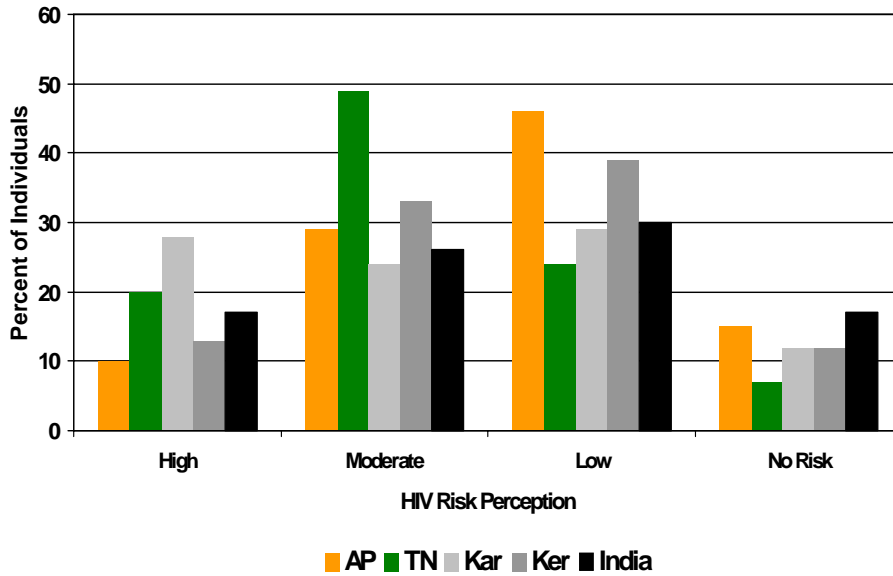
*Source: Andhra Pradesh State AIDS Control Society

Figure 19. Reasons for Not Using a Condom at Last Sex with Paying Clients, 2001 BSS Among High Risk Population*



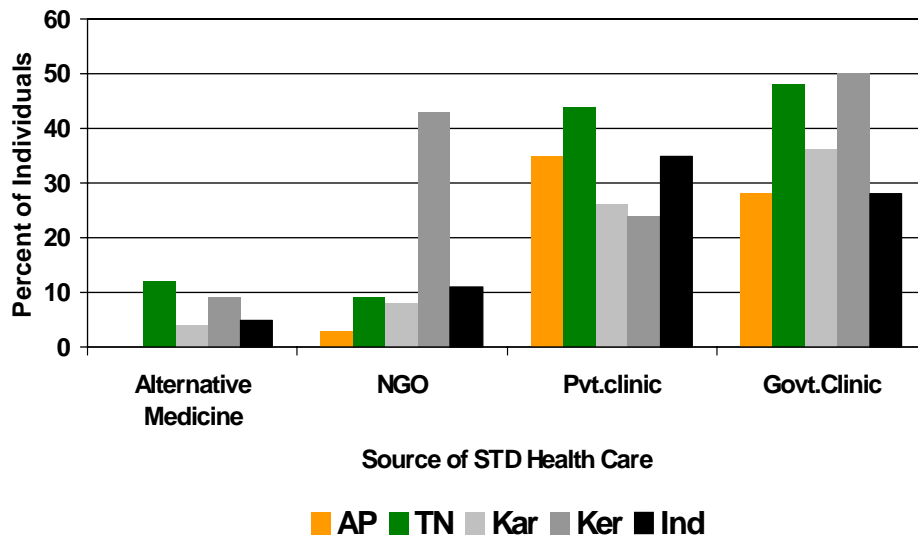
*Source: Andhra Pradesh State AIDS Control Society

Figure 20. Risk Perception to HIV/AIDS, 2001 BSS Among High Risk Population*



*Source: Andhra Pradesh State AIDS Control Society

Figure 21. STD Treatment Seeking Behavior, 2001 BSS Among High Risk Population*



*Source: Andhra Pradesh State AIDS Control Society

SECTION 2: CONCLUSIONS AND SUGGESTIONS

CONCLUSIONS

The collection and analysis of epidemiologic data for public health purposes is an ongoing process. The initial Visakhapatnam HIV/AIDS Epidemiologic Profile can be used as a baseline point of comparison for data compiled in subsequent years. Data collected over several years can be used to identify trends and to better inform program design and resource allocation decisions.

The process of developing the Visakhapatnam Epidemiologic Profile increased understanding of the quality and completeness of the data elements from each data source. The process also identified and highlighted the indicators in each data source that have particular utility for guiding programmatic decisions.

Data representing both the general population and at-risk populations were included in the Profile. The relatively low HIV prevalence in the general population was shown in the three PPTCT sites, a blood bank, 2003 sentinel surveillance ANC data, and 2001 BSS data for the general population. The relatively higher HIV prevalence in risk populations was shown in data from three VCTC sites, an STD clinic, sentinel surveillance data for FSWs and STD clinic clients, and 2001 BSS data for high-risk populations.

Data were limited to government-funded sites. Future profiles incorporating private sector and the non-governmental community will improve the generalizability of the profile to the entire Visakhapatnam population.

General Population

Statewide behavioral surveillance survey data indicated a relatively high level of awareness and HIV-related knowledge among the general population in Andhra Pradesh compared to neighboring states and the country as a whole. While knowledge was high, including awareness of the link between HIV and sexually transmitted disease, 19% of men surveyed and 7% of women in AP reported non-regular sexual partners. Only 48% of Andhra Pradesh adults surveyed reported condom use during their last sexual encounter with a non-regular partner.

Data from ANC sentinel surveillance and PPTCT clinics are representative of women in the general population seeking government-funded health care services. ANC and PPTCT populations had much lower proportions of HIV positive individuals than other data sources (e.g. VCTC) in both urban and rural settings. The proportion of HIV positivity among PPTCT clients varied across the three sites. The two urban sites included King George Hospital (2.1% seropositive: 61 of 2,898) and Victoria General Hospital (1.0% seropositive: 31 of 3,196). Anakapalle Area Hospital was the data collection site for both the third PPTCT clinic (1.9% seropositive: 7 of 369) and one of the ANC sentinel surveillance sites (1.0% seropositive: 4 of 400). There is potentially some overlap between the two Anakapalle data sources. Aganampudi Area Hospital

was the second ANC sentinel surveillance site and reported a prevalence of 2.3% (9 of 400). Both ANC sentinel surveillance sites provide service to primarily rural regions in the district.

Risk behavior and reason for visit data were generally sparse with the exception of the KGH PPTCT clinic. Nearly forty-eight percent (47.5%: 29 of 61) of KGH HIV positive women reported that their husbands had multiple sexual partners (21 of 61) and/or extra marital exposure (8 of 61).

Data from the KGH blood bank represent the general population seeking to donate blood at a government-funded health care facility in Visakhapatnam. Over 90% of HIV positive, accepted blood bank donors were men (92.8%: 90 of 97). Risk information was not available for this population. The majority of HIV positive donors were replacement donors.

Women in the general population accessing government services are well represented in the Visakhapatnam data sources. Data on risk information and reason for visit should receive increased emphasis for both male and female HIV positive patients in sites serving the relatively low risk, general public.

At-Risk Populations

Statewide behavioral surveillance data from commercial sex workers and their clients in Andhra Pradesh indicated a high level of HIV awareness; most had heard of HIV/AIDS and a majority was aware that a healthy looking person might be HIV-infected. However the majority of sex workers felt that they were at low or no risk for HIV infection. In comparison to other states and to the national percentage, AP sex workers were more likely to report that access was a barrier to condom use, as was not feeling the need to use a condom. Most AP sex workers surveyed reported that resistance was the reason for not using a condom with their last paying client.

Data from AIDS case reports, the three VCTC sites, sentinel surveillance (FSW and STD), and STD clinic data are representative of individuals seeking government-funded health care services who be infected or at risk for HIV infection. Aggregate AIDS case data indicated that sexual transmission was the predominant route of HIV infection (86.4%: 121 of 140) and the majority of cases were between the ages of 20-29 years (45%: 63 of 140). Females comprised 41.4% (58 of 140) of the total AIDS cases and tended to be younger than male cases, with the majority (56.9%: 33 of 58) between the ages of 20-29 years. Tuberculosis was the most commonly reported opportunistic infection (51.8%: 71 of 137).

Unlike ANC and PPTCT populations, HIV positivity at VCTC sites did vary by geographic setting, however some of this difference may be attributed to referral patterns for confirmatory testing and follow-up care. The two rural VCTC sites had a similar percentage of individuals testing positive: Anakapalle Area Hospital (11% or 108 of 1006) and Narsipatnam Area Hospital (10% or 66 of 691). The Andhra Medical

College, Microbiology Department was the third VCTC. The urban VCTC's significantly higher proportion of HIV positive cases (29% or 1098 of 3791) may in part be explained by clients seeking confirmatory testing, however data were not available on individuals previous testing history. Sociodemographic variables were generally complete at all three sites, however 'risk behavior' and 'reason for visit' indicators were typically missing from the two rural sites. Among the HIV positive male clients at Andhra Medical College VCTC, 53.7% (338 of 630) of the men listed prolonged illness as the reason for the VCTC visit and 95% (598 of 630) listed multiple (heterosexual) partners as their risk behavior. In comparison, 48.2% (191 of 396) of AMC female clients cited their spouse's HIV infection as the reason for their visit.

Statewide 1998-2002 STD sentinel surveillance trend data indicate that Visakhapatnam has a higher proportion of HIV positive individuals among its STD clinic population than the state as a whole (Figure 10). Sentinel surveillance 2003 data show high HIV positivity among the AMC STD clinic population. Seventy-four of 250 (29.6%) STD clinic clients tested positive. Among seropositive individuals, the majority of males were agricultural unskilled workers (55.3%: 21 of 38) and half of females were housewives (50.0%: 18 of 36).

STD sentinel surveillance data and a sample of STD clinic data were both collected from Andhra Medical College. Males made up a larger proportion of both populations (55.3%: 139 of 250 of sentinel surveillance, and 67.6%: 231 of 713 of STD clinic data). Genital ulcers and genital warts were the most common STDs symptomatically diagnosed among sentinel surveillance records. Among the sample of STD clinic data, balanoposthitis (74 of 482) and warts (29 of 482) were the most common laboratory confirmed diagnoses among males; herpes (37 of 231) and Candidiasis (28 of 231) were the most common among females. A significant proportion of STD patients cited HIV screening or HIV exposure as their reason for visit. Of patients who reported knowing their HIV status, 26% were HIV positive.

In 2003, the HIV testing results of female sex workers (FSW) was added as another component of the sentinel surveillance survey. Among 250 women surveyed, 12.8% (32 of 250) were HIV positive. In Visakhapatnam, FSWs primarily resided in urban areas and had very low levels of education.

GENERAL SUGGESTIONS BASED ON DATA & FIELD OBSERVATIONS

Data Quality Suggestions

1. Conduct regular training sessions with counselors regarding data collection and counseling technique. Emphasize importance of consistency in maintaining records and the need to document any changes in data collection or recording protocols. This is especially important in sites with more than one counselor and/or high turnover.
 - Be consistent in how missing data are recorded.
 - Be consistent in recording address information (e.g. specifying mandals in the record).

2. Provide on-going feedback on the quality of data completed in the registers.
3. Place more emphasis on obtaining behavioral data (e.g. risk behaviors, reason for visit) than on process indicators.

Programmatic Suggestions

1. Consider establishing VCTCs within STD Clinics and at sites (e.g. NGOs) other than Community Health Centers and the medical teaching hospital to encourage more people to test and to test earlier. Many individuals reported testing because a spouse was infected/had died or because of prolonged illness. Additional VCTCs may encourage earlier testing.
2. Ensure that HIV testing kits and data collection registers stay stocked at various clinics.

Data Source-Specific Suggestions

VCTC

1. Focus on “reason for visit” and “risk information” variables, especially in rural areas. “Risk behavior” was not very complete at rural VCTC sites.
2. Record referral information from different sites (e.g. STD Clinic, blood bank).
3. Record whether client is seeking a confirmatory test or is unaware of their status.
4. AMC VCTC collects additional information on some of the items in the 51-item NACO questionnaire, however the selection of variables is not uniform for each client. It may make sense to focus on a few priority questions.
4. Risk behavior – be able to select more than one type of behavior, if applicable.
5. Marital Status – include “separated or living apart” as a possible answer to capture individuals that are married, but not living with their spouse.

PPTCT

1. Recommend using a PPTCT-specific form. With the current practice of using the VCTC form, some of the indicators are not appropriate for PPTCT and other important indicators are not systematically collected.
 - Include separate categories for spouse occupation and spouse risk.
 - Include standardized follow-up questions for HIV positive women (e.g. Nevaripine administered? MTP?, delivery outcome?, spouse status? Referral patterns, etc.) Currently the counselors record this information on their own, but it is not done consistently or for all patients.
2. The “reason for visit” variable at PPTCT is not a useful variable since all answers are generally ANC or PPTCT.
3. “Risk behavior” and “Occupation” at PPTCT sites was sometimes the spouse’s information and not that of the clients (a cursory look at the register wouldn’t reveal this, but discussion with the counselors did). It would be useful to document whether an occupation was that of the spouse or of the tested individual or to simply include a separate variable for spouse occupation.
5. Suggestion to complete risk information question during *post*-test counseling session, especially for HIV positive women. Currently, risk information is generally left blank for PPTCT clients.

Sentinel Surveillance

1. Consider entering data at AP SACS before submitting all forms to NACO in order to analyze individual-level data at the district and state level.

STD Clinic

1. “Reason for visit” and “risk information” are not part of the standard STD case report. If possible, these items should be added to the form or the medical social worker could be encouraged to consistently record this information

2. Establish a VCTC site at the AMC STD clinic since data show that a large number of clients are coming to the clinic for HIV/AIDS-related services. Referring individuals to AMC VCTC without a standardized feedback loop to the STD clinic is problematic for a few reasons:

- Missed opportunity for HIV/AIDS counseling
- Under-representing true HIV/AIDS-STD co-morbidity
- Client may not get tested if they have to visit another location
- Currently all STD data are laboratory confirmed, but the HIV data are self-reported. Data quality would be improved if HIV data were also laboratory confirmed.

APPENDICES

APPENDIX A. DESCRIPTION OF DATA SOURCES

The HIV/AIDS epidemiologic profile relies on the use of various sources of data to create a picture of the impact of HIV/AIDS in a specific geographic area. The picture can only be as complete, accurate, and detailed as the data used to create it.

Table 36 describes the completeness of common variables in the various data sources that were used for the Visakhapatnam epidemiologic profile. There was often a high degree of completeness of variables, especially among the sociodemographic variables, 'Risk behavior' and 'reason for visit' variables were notable exceptions to the high level of completeness.

Table 36. Degree of Completeness for Common Variables Across Data Sources

DATA SOURCES	COMMON VARIABLES (% complete)							
	Sex	Age	Education	Marital Status	Occupation	Risk Behavior	Visit Reason	Mandal
VCTC								
AMC	100	99.7	95.4	94.4	94.6	98	98.4	96.3
Narsipatnam	100	100	97.5	97.5	93.4	22.3	95.9*	96.5
Anakapalle	99	99.5	92.1	97	91.1	36.7	60.9	100
PPTCT								
KGH	100	100	91	91	23	73	89*	98
Anakapalle	100	100	97.7	100	100	0	100*	100
VGH	100	99.3	99.7	100	99.7	76.3	69.5*	77.7
Blood Bank								
KGH	100	100	100	0	98	N/A	N/A	97.4
STD								
KGH/AMC	100	99.4	98.3	98.3	97.6	57.9**	60.7**	90.5
AIDS Cases								
KGH	100	91.1	N/A	37.8	77.8	N/A	N/A	75.6
TB Chest Hospital	100	100	N/A	31.1	73.3	N/A	N/A	73.3
Care & Support								
Green Vision	99.2	99.2	N/A	97.7	97.7	N/A	N/A	85.8

*Variable has limited utility given the response (e.g. other, ANC, PPTCT)

**Variable is not part of standard STD case sheet

In order to describe magnitude more accurately it would be helpful to understand why people are receiving HIV tests in the different settings. Are they coming to confirm a positive test result previously received in another health care setting? Are they getting tested for the first time? It would also be helpful to understand and document referral patterns; in the data presented in this epidemiologic profile, there are undoubtedly

people who have been counted multiple times since it's not possible to unduplicate the data.

In order to better understand the characteristics of those infected with or at risk for HIV infection, more information is needed about specific risk behaviors. Providing ongoing training and feedback to those collecting and recording data in clinic settings will be an important step in improving the accuracy and completeness of the data. Additionally, it may be helpful to uniformly prioritize key questions to be asked of clients in different health care settings.

1. General Population Data

- 2001 Indian Census

Census data are collected every ten years in India and are the most complete and descriptive data for characterizing the general population. The data however, may under-represent migrant, tribal, and/or disenfranchised populations.

2. AIDS Case Reports

- King George Hospital AIDS Case Reports
- CHEST Hospital AIDS Case Reports

Variables collected

The individual-level NACO form collects the following data elements: sociodemographic characteristics, risk factors and practices, history of STD, drug use, syringe sharing, pregnancy information for women, AIDS symptoms and signs, laboratory tests performed, and HIV tests.

Table 37. Indicators Selected for AIDS Case Reports – King George Hospital and CHEST Hospital

Variable Name	KGH Percent Complete	CHEST Hospital Percent Complete
1 District	100	100
2 Sex	100	100
3 Age	91.1	100
4 Mandal	75.6	73.3
5 Marital Status	37.8	77.8
6 Occupation	31.1	73.3

Data quality issues

In order to collect information on AIDS cases, a representative from AP SACS visited the medical records office at KGH. The records are stored by date, however the data have not been summarized in any way. There were over 20,000 medical records at KGH for the 2002 fiscal year alone. Per feedback from AP SACS, there was concern that not all of the AIDS cases were identified given the number of KGH records to review. The CHEST Hospital had a much smaller case load and AP SACS was more

confident that they were able to identify the majority of AIDS cases from this institution for the 2002 fiscal year.

Strengths and Limitations

AIDS case data characterize individuals who are at advanced stages of HIV disease. Since many clinicians are unaware of the NACO case report form and consequently do not fill out the form, AIDS cases are underreported. Individual-level data are not received by AP SACS; only aggregate level information is generally received from primarily government-funded institutions.

3. Blood Bank Data

- King George Hospital Blood Bank

Indicator Collection

Donor registration cards were not available for the time period covered by this epidemiologic profile so information was abstracted directly from the blood bank register by the medical social worker. Table 38 lists the indicators collected from the KGH blood bank and the degree of completeness of each variable.

Table 38. Indicators Selected for KGH Blood Bank

	Variable Name	Percent Complete (%)
1	Donor Registration Number	100
2	Date	100
3	Age	100
4	Sex	100
5	Education	100
6	Replacement or Voluntary Donor	100
7	HIV Status	100
8	Hepatitis B Status	100
9	Hepatitis C Status	100
10	VRDL Reactive	100
11	Occupation	98

Six additional variables were originally selected for abstraction using the donor card, but were not included because they were either not collected (e.g. marital status, which is a variable that has since been added to the blood bank register), or because the variables were not available among *accepted* blood bank donors (i.e. people who answered the questions in a way that indicated risk were rejected as donors).

Variables of interest that were not collected:

- Marital status
- In the last 12 months have you ever received a blood transfusion, acupuncture, tattoo, ear or nose piercing?
- In the last 12 months did you have jaundice or test positive for Hepatitis B?
- Have you ever had a positive test for AIDS?

- Have you had unexplained fever, night sweats, weight loss, enlarged lymph glands, purplish skin lesions, white spot in the mouth, persistent cough, or diarrhea?
- Have you ever taken illegal drugs or injection?

Strengths and Limitations

Information about donors who test HIV positive at the blood bank is useful for describing demographic characteristics of those in the general population who are infected. Data are collected on co-infection with other diseases including Hepatitis B, Hepatitis C, syphilis, and malaria.

Risk information is not included in the blood bank register. Individuals who test positive are referred to the AMC VCTC, so there will be duplicate data included in the AMC VCTC data sets. Data from the KGH Blood Bank are not representative of all blood bank donors in Visakhapatnam, and reflect only those tested in a publicly funded setting. Since people who answered “yes” to any of the symptom/risk questions were rejected as donors, data from the HIV positive accepted blood bank donors underestimates the total number of HIV positive individuals who intend to donate blood.

Generally, blood bank data is useful for examining HIV prevalence among the low risk general population. Given that such a high proportion of HIV positive cases were replacement donors and not voluntary donors this may have some implications for generalizing the findings.

4. Voluntary Counseling and Testing Center (VCTC) Data

VTCT sites were established in order to perform HIV counseling and testing for the general population with self-perceived risk for HIV infection. Government-funded VCTC sites are currently based in medical colleges and area hospital settings. Data from three VCTC sites were included in the profile:

- Andhra Medical College, Microbiology Department
- Victoria General Hospital
- Anakapalle Area Hospital

General Suggestions Based on Data and Field Observations

1. Focus on “reason for visit” and “risk information” variables, especially in rural areas. “Risk behavior” was not very complete at rural VCTC sites.
2. Record referral information from different sites (e.g. STD Clinic, blood bank).
3. Record whether client is seeking a confirmatory test or is unaware of their status.
4. AMC VCTC collects additional information on some of the items in the 51-item NACO questionnaire, however the selection of variables is not uniform for each client. It may make sense to focus on a few “key” questions.
5. Risk behavior – be able to select more than one type of behavior, if applicable.
6. Marital Status – included “separated” as a possible answer to capture individuals that are married, but not living with their spouse.

A. Andhra Medical College, Microbiology Department, VCTC

Variables collected

Table 39. VTCT Indicators collected for Andhra Medical College, (KGH) Microbiology Department (n=1465)

Variable Name	Percent Complete (%)
1 Patient Identification Number	100
2 Date	100
3 Sex	100
4 Referral Information	99.7
5 Age	99.0
6 Reason for Visit to VCTC	98.4
7 Type of Risk Behavior	98.0
8 Mandal Name	96.3
9 HIV Test Report	100
10 Education	95.4
11 Occupation	94.6
12 Marital Status	94.4
13 Were you ever tested for HIV in the past?	93.8
14 Do you consume alcohol?	92.4
15 District Name	87.4
16 Did you ever have sex with a person of your own sex?	79.5
17 Did you ever use a condom in your life?	79.5
18 Do you use condoms during sex with non-regular partner?	78.6
19 Number of sex partners in lifetime?	78.2
20 If yes, how best can you describe the condom use?	77.9
21 Ever receive blood transfusion in the past?	43.4

Data quality issues

A few additional variables were originally selected for data collection from the 51-item survey instrument, but were later not collected since the parameter was generally not collected. The following three questions were dropped:

1. If yes (i.e. tested for HIV in the past), when? What was the result? Reason tested?
2. Did you ever share injection syringe and needle with others?
3. Have you ever taken injecting drugs (substance use)?

Strengths and Limitations

The AMC VCTC data are collected in one-to-one interviews and provide information on risk behavior and reasons for getting an HIV test. The data are fairly complete for the core VCTC questions. Some of the additional items of interest from the 51-item questionnaire were not always asked of clients.

B. Anakapalle Area Hospital, VCTC

Variables collected

Table 40. VCTC Indicators collected for Anakapalle Area Hospital

Variable Name	Percent Complete (%)
1 Patient Identification Number	100
2 Mandal Name	100
3 HIV Status	100
4 Date	100
5 Age	99.5
6 Referral Information	99.0
7 Sex	99.0
8 District Name	98.2
9 Marital Status	97.0
10 Education	92.1
11 Occupation	91.1
12 Reason for Visit to VCTC	60.9
13 Type of Risk Behavior	36.7

Data quality issues

During January 2003 the VCTC records were stored in a modified register since the official register had not been received. Due to an insufficient number of HIV testing kits in August 2002 and November 2002, limited data were available.

Strengths and Limitations

Anakapalle is one of two sources of rural population data for the epidemiologic profile. The Anakapalle VCTC data includes information collected in the pre- and post-test register. The 51-item survey is not used. Limited risk information is available, however basic sociodemographic information data collection is quite complete.

C. Narsipatnam Area Hospital, VCTC

Variables collected

Table 41. VCTC Indicators collected for Narsipatnam Area Hospital

	Variable Name	Percent Complete
1	Patient Identification Number	100
2	Date	100
3	Referral Information	100
4	Age	100
5	Sex	100
6	HIV Status	100
7	Education	97.5
8	Marital Status	97.5
9	District Name	96.7
10	Mandal Name	96.5
11	Reason for Visit to VCTC	95.9*
12	Occupation	93.4
13	Type of Risk Behavior	22.3

*54.5% of responses are “other” or “missing”

Data quality issues

A shortage in HIV testing kits meant that HIV screening was not conducted in October 2002. In addition, the shortage resulted in limited testing for part of November 2002. From January 25-31, 2003 HIV testing was not conducted since the laboratory technician was on leave, however pretest counseling occurred.

Strengths and Limitations

Overall, the degree of completeness is high for the Narsipatnam VCTC data. Limited risk information is collected, which may be a result of group pre-test counseling. While the degree of completeness is high for “reason for visit”, more than half (53%) of all responses are “other”, which limits the usefulness of the data.

5. Prevention of Parent to Child Transmission (PPTCT) Data

PPTCT sites were established in order to perform HIV counseling and testing for pregnant women. Prior to 2002, there was only one PPTCT site established in Andhra Pradesh on an experimental basis. In 2002, 14 centers were added at medical colleges. Data from three PPTCT sites were included in the profile:

- King George Hospital
- Victoria General Hospital
- Anakapalle Area Hospital

General Suggestions Based on Data and Field Observations

1. Recommend using a PPTCT-specific form. With the current practice of using the VCTC form, some of the indicators are not appropriate to collect and other important indicators are not systematically collected.
 - Include separate categories for spouse occupation and spouse risk from PPTCT client occupation and client risk
 - Includes standardized follow-up questions for HIV positive women (e.g. Nevaripine administered?, MTP?, delivery outcome?, spouse status? Referral patterns, etc.) Currently the counselors recorded this information on their own, but it is not done consistently or for all patients.
2. “Reason for visit” variable at PPTCT (not a useful variable since all answers are generally ANC or PPTCT).
3. “Risk behavior” and “Occupation” at PPTCT sites was sometimes the spouse’s information and not that of the clients (a cursory look at the register wouldn’t reveal this, but discussion with the counselors would). It would be useful to document whether an occupation was that of the spouse or of the tested individual.
4. Suggestion to complete risk information question during *post*-test counseling session, especially for HIV positive women. Currently, risk information is generally left blank for PPTCT clients.

A. King George Hospital, PPTCT

Variables Collected

Table 42. PPTCT Indicators collected for King George Hospital

	Variable Name	Percent Complete (%)
All records (n=292)		
1	Patient Identification Number	100
2	Date	100
3	Referral Information	86
4	HIV Status	100
5	Age	100
6	Sex	100
7	Mandal Name	98
8	District Name	95
9	Marital Status	91
10	Education	91
11	Reason for Visit to VCTC	89
12	Type of Risk Behavior	73
13	Occupation (self)	23
Additional Variables for HIV Positive Women (n=61)*		
14	Occupation (spouse)	77
15	Received a blood transfusion	25
16	Ever tested for HIV	23
17	Partner ever used condoms	23
18	Plan to continue pregnancy	18

*Collection of variables 14-18 was at the counselors' own initiative and was not prescribed by NACO.

Data quality issues

The standard VCTC register is used by all PPTCT centers. For a period of eight months, the two KGH PPTCT counselors did not have the standard VCTC register and instead maintained a register that they created on their own. This led to some inconsistency in how the two counselors maintained the records.

Strengths and Limitations

The counselors maintain a separate register for HIV positive women, which includes additional follow-up information not generally collected in the standard VCTC register. The additional information, while quite relevant, is only a quarter complete for positive clients since it was not collected uniformly.

Due to space and manpower constraints, pre-test counseling generally occurs in a 1:5 ratio of counselors to clients. Post-test counseling for HIV positive women occurs in a 1:1 ratio. Group counseling precludes in-depth discussions of individual client's potential risk behavior. As a result, the risk behavior indicator is generally not completed. The majority of women screened at the PPTCT center are women coming

for general antenatal care check-ups. As a result, the “reason for visit” variable is predominately filled out as “ANC”, which means that this variable is of limited use.

B. Victoria General Hospital, PPTCT

Variables collected

Table 43. PPTCT Indicators collected for Victoria General Hospital

Variable Name	Percent Complete (%)
All records (n=410)	
1 Patient Identification Number	100
2 Date	100
3 HIV Status	100
4 Sex	100
5 Marital Status	100
6 Education	99.7
7 District Name	99.7
8 Occupation	99.7
9 Age	99.3
10 Referral Information	91.2
11 Mandal Name	77.7
12 Type of Risk Behavior	76.3*
13 Reason for Visit to VCTC	69.5*
Additional Variables for HIV Positive Women (n=35)**	
14 Spouse HIV Status	100
15 Spouse Occupation	88.6
16 Spouse Ever Use Condoms	83.9
17 Ever Receive Blood Transfusion	80
18 Husband’s Alcohol Use	74.2
19 Spouse Risk Behavior	20.0
20 Pregnancy outcome	14.3
21 Nevaripine Administered	11.4

* Variable was filled out as “ANC” or “PMTCT”

**Collection of variables 13-20 was at the counselors' own initiative and was not prescribed by NACO.

Data quality issues

The VGH PPTCT center started in May 2002, however the official register was not received until June 2002. A temporary register was used for May 2002 data. The center has two counselors and in some cases, they were not consistent in how they filled out the data registers.

Strengths and Limitations

The counselors maintain a separate register for HIV positive women, which includes additional follow-up information not generally collected in the standard VCTC register.

Due to the number of women screened, pre-test counseling generally occurs in a 1:5 ratio of counselors to clients. Post-test counseling for HIV positive women occurs in a 1:1 ratio. Group counseling precludes in-depth discussions of individual client's risk behavior. As a result, the risk behavior indicator is generally not completed. The majority of women screened at the PPTCT center are women coming for general antenatal care check-ups. As a result, the "reason for visit" variable as well as the "risk information" variable are both predominately filled out as "ANC", which means that these variables are of limited use.

C. PPTCT, Anakapalle Area Hospital

Variables collected

Table 44. PPTCT Indicators collected for Anakapalle Area Hospital

Variable Name	Percent Complete (%)
All records (n=44)	
1 Patient Identification Number	100
2 Date	100
3 Referral Information	100
4 Age	100
5 Sex	100
6 Occupation	100
7 Marital Status	100
8 Reason for Visit to VCTC	100*
9 Mandal Name	100
10 HIV Status	100
11 District Name	100
12 Education	97.7
13 Type of Risk Behavior	0
Additional Variables for HIV Positive Women (n=7)**	
14 Referral to KGH for follow-up care	100
15 Medical Termination of Pregnancy (MTP)	28.6

* Variable was filled out as "ANC" or "PMTCT"

**Collection of variables 13-20 was at the counselors' own initiative and was not prescribed by NACO.

Data quality issues

A number of clients attending the PPTCT center do not know their exact age. For this reason, the age variable is often an educated guess by the counselor. In general there was very little variation among the forty-four records. Given the small number of records, it is not clear whether the data reflect an accurate representation of the population or are an artifact of the group pre-test counseling format.

Strengths and Limitations

The counselor maintains a separate register for HIV positive women, which includes some additional follow-up information such as referral to KGH and decision for medical termination of pregnancy (MTP).

Due to the number of women screened, pre-test counseling generally occurs in a 1:5 ratio of counselors to clients. Post-test counseling for HIV positive women occurs in a 1:1 ratio, or with the counselor and other family members present. Pre-test group counseling precludes in-depth discussions of individual client's potential risk behavior. As a result, the risk behavior indicator is not completed. The majority of women screened at the PPTCT center are women coming for general antenatal care check-ups. As a result, the "reason for visit" variable is filled out as "ANC/PMTCT", which means that this variable is of limited use.

6. Care and Support Center Data

A. Green Vision, a non-governmental organization

Variables collected

Table 45. Indicators collected for Green Vision

	Variable Name	Percent Complete (%)
1	Patient Identification Number	100
9	Present Health Problem(s)	100
3	Sex	100
4	District	99.2
5	Age	99.2
6	Occupation	97.7
7	Spouse Infection Status	97.7
8	Spouse Tested for HIV	96.2
9	Treatment Provided	96.2
10	Mandal Name	85.8
11	Date	24.0

Strengths and Limitations

Green Vision data represent the only care and support data in the epidemiologic profile. The NGO data provides information on AIDS clients in Visakhapatnam. Information on spouse's infection status and basic sociodemographic information are included.

Treatment data are limited to a 'yes/no' response, which limits the usefulness of the information for use in the epidemiologic profile. In addition, descriptions of health problems are often limited to symptoms and do not include diagnoses.

7. 2003 Sentinel Surveillance Data

Annual unlinked and anonymous sentinel HIV surveillance takes place over a 12-week period from August through October throughout India. The sentinel surveillance program is nationally coordinated by the National AIDS Control Organization (NACO) and is regionally coordinated (within AP) by the Indian Institute of Health and Family Welfare (IIHFW). Each year, data are collected from all districts in antenatal care clinics (ANC) and in sites treating sexually transmitted diseases (STD). ANC data are used as a proxy to assess prevalence in the general population and STD data is a proxy for HIV prevalence in the high-risk population. Original data collection forms are sent to AP SACS and then forwarded to NACO for analysis and report preparation.

A number of variables are collected for both ANC and STD records, including sample number, date, age, sex, locality (urban vs. rural), migrant status, literacy status, occupation (self), HIV status, Hepatitis B, C, and syphilis, and syndromic diagnosis (for STD cases). A migrant was defined as a person who was living at a place other than his/her residence for more than six months.

The 2003 Visakhapatnam sentinel surveillance sites included:

- STD Data from Andhra Medical College, STD and AIDS Department
- Female Sex Worker Data collected by NGO
- Antenatal Clinic Data from Anakapalle Area Hospital
- Antenatal Clinic Data from Aganampudi Area Hospital

General Suggestions Based on Data and Field Observations

1. Consider entering data at AP SACS before submitting all forms to NACO in order to analyze individual-level data at the district and state level.

Strengths and Limitations

Standardized data collection and the blinded nature of data collection are strengths of the sentinel surveillance program.

Risk information is not collected, but assumed based on the nature of the clinic site. Duplication may be included in the data since it is not possible to separate sentinel surveillance data from data routinely collected at STD and PPTCT sites.

Sentinel surveillance data for 1998 to 2003 were available in aggregate format. Individual-level information would be useful for future data analysis.

8. Sexually Transmitted Disease (STD) Clinic Data

State STD programs came under the control of the State AIDS Control Societies (SACS) in 1992. The SACS collects data on an ongoing basis from STD clinics in government medical colleges, district hospitals, and area hospitals. STD data are not collected from the private sector. In the public sector, the majority of laboratory confirmed cases are reported from the medical colleges, where laboratory support is

better than in the area hospitals. Data from these sites are reported on a number of STDs, including syphilis, gonorrhea, chlamydia, herpes, etc.

General Suggestions Based on Data and Field Observations

1. "Reason for visit" and "risk information" are not part of the standard STD case report. If possible, these items should be added to the form or the medical social worker could be encouraged to consistently record this information
2. Establish a VCTC site at the AMC STD clinic since data show that a large number of clients are coming to the clinic for HIV/AIDS-related services. Referring individuals to AMC VCTC without a standardized feedback loop to the STD clinic is problematic for a few reasons:
 - Missed opportunity for HIV/AIDS counseling
 - Under-representing true HIV/AIDS-STD co-morbidity
 - Client may not get tested if they have to visit another location
 - Currently all STD data are laboratory confirmed, but the HIV data are self-reported. Data quality would be improved if HIV data were also laboratory confirmed.

A. STD, Andhra Medical College, STD and AIDS Department

Variables collected

Table 46. Indicators Collected for Sexually Transmitted Disease Data – AMC (n=713)

	Variable Name	Percent Complete (%)
1	Record number	100
2	Date	100
3	Sex	100
4	Age	99.4
5	Marital Status	98.3
6	Education	98.3
7	Occupation	97.6
8	District Name	97.5
9	Mandal Name	90.5
10	Reason for Visit	60.7*
11	Risk Information	57.9*
12	HIV Status	51.8
13	Monthly Income	45.7*
14	STD Diagnosis	N/A

*Variables are not part of standard STD case sheet and are therefore not uniformly collected

Data quality issues/comments

Data quality of the STD records was generally good. Variables that are listed on the STD card were filled out most of the time. Risk information and reason for visit are not included on the STD card as distinct variables, but the information was often recorded by the medical social worker in her narrative notes; as a result, these variables were not

uniformly available. According to the Head of the Department, the majority of clients come to the clinic for HIV screening. Educational status is indicated as nil or with a dash when a client is illiterate. In regards to sampling, an attempt to sample every third record was made, however sampling was not uniform for male records. At times, every second record was sampled, particularly when the record belonged to an HIV+ individual; consequently, there may be some bias in regards to the number of men who are co-infected with STDs and HIV.

Strengths and limitations

STD data can serve as an indirect indicator of unprotected sexual activity that may result in HIV transmission. Due to the considerably shorter incubation period for STDs, these data may provide more timely information on behavioral trends. In addition, certain STDs can facilitate the transmission or acquisition of HIV infection, so targeting STD clinic attendees with HIV prevention messages can be important in preventing transmission. STD records at Andhra Medical College include some information regarding HIV status, although not uniformly. All diagnosed STDs are laboratory confirmed.

While data about people diagnosed with STDs at Andhra Medical College may represent the majority of those diagnosed with STDs in the public sector in Visakhapatnam, they may not be representative of all people with STDs in the district because they do not include those diagnosed in the private sector. Data from the medical college may also not be representative of people with STDs who live in rural areas since the data from the area hospitals were not included. However, data from the area hospitals comprise only 3% of the STD records in the three settings. HIV status was not uniformly included in the STD records because, although the STD clinic refers clients to AMC VCTC for HIV counseling and testing, there is no standard feedback loop for information about HIV test results. The STD record only contains laboratory-confirmed HIV results if the patient reports results to the STD clinic from AMC VCTC or another VCTC site. Individuals who are described as HIV-infected in the STD data may be duplicates of those individuals described as HIV-infected in the AMC VCTC data.

9. Behavioral Surveillance System (BSS) Data – General Population and Targeted High Risk Population

The Behavioral Surveillance System was conducted in 2001 for thirty-two states and union territories across India. The target population for the BSS was the general population and included both men and women between the ages of 15-49 years from urban and rural areas. In addition to the general BSS, a targeted BSS was conducted in selected states, including Andhra Pradesh, for high-risk groups, including non-brothel based female sex workers and clients of sex workers.

Aggregate statewide figures and tables created by NACO were available for Kerala, Andhra Pradesh, Tamil Nadu, and Karnataka and provide some information on the general population's HIV/AIDS-related knowledge and behaviors in Southern India.

APPENDIX B. TECHNICAL NOTES

Data quality was assessed at each site by speaking with individual counselors, social workers, and laboratory technicians who collected the data as well as with heads of departments and chief medical officers. A May 2003 data source document prepared by NASTAD in consultation with AP SACS staff on available data sources in Andhra Pradesh was also used as a reference.

Questions Asked Regarding Data Quality:

1. Date that site started?
2. When did reporting in current format start?
3. Any incomplete periods? E.g. missing forms for certain time period?
4. Are all selected indicators usually completed?
5. How is data collected for each individual?
6. Does staff ask all form questions?
7. How are the data stored?
8. Examples of Additional Site Specific Questions
 - a. Return rate for HIV test report?
 - b. Ratio of counselor to client?
 - c. Staff training?
 - d. Reason for incomplete data?

Demographic breakdowns for each of the data sources were largely dependent on how the primary data were collected. Occupational categories from the 2003 Sentinel Surveillance report were adopted with a few modifications.

Table 47. Occupational Categories and List of Actual Occupations

Occupational Category	Examples of Actual Occupations
Agriculture	Farmer
Business	Pan Shop, Restaurant
Employed – unspecified	
Employed – private	
Employed – public/government	Police
Housewife	
Professionals	Physician, Teacher, Lawyer, Engineer, Priest
Service Sector – skilled	Carpenter, Electrician, Tailor
Service Sector – unskilled	Coolie, Laborer, Fisherman, Attender, Servant
Student	
Transportation	Lorry/Taxi/Auto/Car Driver or Cleaner
Unemployed	
Missing	

APPENDIX C. GLOSSARY OF EPIDEMIOLOGIC TERMS*

Epidemiology – The study of the distribution and determinants of disease within human populations.

Opportunistic Infections – Those diseases, which are caused by agents that are commonly present in our bodies or environment, such as when the immune system becomes depressed.

Prevalence – The proportion of persons in a given population who have a particular disease at a point or interval of time.

Seroprevalence – The frequency of individuals in a population that have antibodies to a particular organism, e.g. HIV, in their blood serum.

Surveillance – Ongoing observation of a population for rapid and accurate detection of changes in the occurrence of particular diseases.

*Definitions adopted from An Epidemiologic Profile of HIV and AIDS in Los Angeles County, July 2000.

APPENDIX D. LIST OF ACRONYMS

1. AMC - Andhra Medical College
2. ANC – Antenatal Clinic
3. AP SACS – Andhra Pradesh State AIDS Control Society
4. BSS – Behavioral Surveillance System
5. CDC-GAP – U.S. Centers for Disease Control and Prevention – Global AIDS Program
6. CM – Chief Minister
7. DC – District Collector
8. DLO – District Leprosy Officer (Dr. R. Prasad)
9. VGH – Victoria General Hospital
10. HOD – Head of Department
11. KGH – King George Hospital
12. MTP – Medical Termination of Pregnancy
13. NACO – National AIDS Control Organization
14. NASTAD – U.S. National Alliance of State and Territorial AIDS Directors
15. NRP – Non-Regular Sexual Partner
16. O.I. – Opportunistic Infection
17. PD – Project Director
18. PID – Patient Identification Number
19. PLWHA – Person Living with HIV/AIDS
20. PMTCT – Prevention of Mother to Child Transmission
21. PPTCT – Prevention of Parent to Child Transmission
22. SACS - State AIDS Control Society
23. SES – Socioeconomic Status
24. SPM – Social Preventative Medicine (former name of Community Medicine Department)
25. SSC - Secondary School Certificate (equivalent to completing 10th standard)
26. STD – Sexually Transmitted Disease
27. TAN SACS – Tamil Nadu State AIDS Control Society
28. VCTC – Voluntary Counseling and Testing Center

APPENDIX E. 2002 Aggregate Sentinel Surveillance Data

The two 2002 sentinel surveillance sites in Visakhapatnam District included one STD clinic and one antenatal clinic. The sample size included 250 patients from the STD clinic, AMC STD Clinic, and 400 patients from the antenatal clinic, Anakapalle Area Hospital.

A. STD Sentinel Surveillance Data

Visakhapatnam District STD sentinel surveillance data for 2002 were available in aggregate format. Tables 48 through 51 describe the sociodemographic characteristics and geographic distribution among HIV positive STD sentinel survey participants. It should be noted that not all sentinel surveillance data discussed are presented in the table, but can be derived from them. Among the 250 person STD sample, 89 were HIV positive (35.6%). Those testing HIV positive included 58 males (65%) and 31 (35%) females. Sixty-five (58 of 89) percent of the seropositive individuals were male compared to 70.8% (114 of 161) of HIV negatives. More than half (65.1%: 58 of 89) of HIV positive individuals reported living in an urban area compared to 72.7% (117 of 161) of HIV negative STD clinic patients (Table 49). The majority of HIV positive males were classified as agriculture/unskilled workers (60.3%: 35 of 58) and the majority of HIV positive females were classified as housewives (54.8%: 17 of 31).

Table 48. 2002 STD Sentinel Surveillance, Age and Sex Distribution*

Age Group Years	Male			Female			Total		
	No. Tested	No. +ve	% +ve	No. Tested	No. +ve	% +ve	No. tested	No. +ve	% +ve
< 20	9	-	-	5	1	20	14	1	7.1
20-29	82	26	31.7	45	18	40	127	44	34.6
30-44	67	27	40.3	24	11	45.8	91	38	41.8
> 45	14	5	35.7	4	1	25	18	6	33.3
Total	172	58	33.7	78	31	39.7	250	89	35.6

*Source: 2002 Sentinel Surveillance AP SACS Report

Table 49. 2002 STD Sentinel Surveillance, Locale Distribution*

Locale	Male			Female			Total		
	No. Tested	No. +ve	% +ve	No. Tested	No. +ve	% +ve	No. tested	No. +ve	% +ve
Urban	116	36	31.0	59	22	37.3	175	58	33.1
Rural	49	22	44.9	26	9	34.6	75	31	41.3
Total	165	58	35.2	85	31	36.5	250	89	35.6

*Source: 2002 Sentinel Surveillance AP SACS Report

Table 50. 2002 STD Sentinel Surveillance, Literacy Status*

Literacy Status	Male			Female			Total		
	No. Tested	No. +ve	% +ve	No. Tested	No. +ve	% +ve	No. tested	No. +ve	% +ve
Illiterate	48	20	41.7	47	21	44.7	95	41	43.2
Literate & till 5 th	17	8	47.1	18	2	11.1	35	10	28.6
Till 12 th	78	26	33.3	20	7	35	98	33	33.7
Graduate & Above	19	4	21.1	3	1	33.3	22	5	22.7
Total	162	58	35.8	88	31	35.3	2.5	89	35.6

*Source: 2002 Sentinel Surveillance AP SACS Report

Table 51. 2002 STD Sentinel Surveillance, Occupation*

Occupation	Male			Female			Total		
	No. Tested	No. +ve	% +ve	No. Tested	No. +ve	% +ve	No. tested	No. +ve	% +ve
Agriculture/Unskilled Worker	100	35	60.3	8	4	12.9	108	39	43.8
Truck/Taxi/Auto/Driver/Cleaner	18	7	12.1	1	1	3.2	19	8	9.0
Industrial & Factory Worker	11	3	5.2	-	-	-	11	2	2.2
Hotel Staff	4	2	3.4	-	-	-	4	2	2.2
Service	5	2	3.4	13	7	22.6	18	9	10.1
Business	9	5	8.6	2	1	3.2	11	6	6.7
Unemployed	7	3	5.2	1	1	3.2	8	4	4.5
Student	8	-	-	-	-	-	8	-	-
Housewife	-	-	-	57	17	54.8	63	19	21.3
Total	168	58	100	82	31	100	250	89	100

*Source: 2002 Sentinel Surveillance AP SACS Report

Table 52 describes signs of sexually transmitted diseases in survey participants. The two most common STDs in HIV positive persons were genital warts (48 of 89) and genital ulcers (32 of 89). Among HIV positive males, genital warts were the most common STD (65.5%: 38 of 58) followed by genital ulcers (31.0%: 18 of 58). Among HIV positive females, this trend was reversed with genital ulcers being the most common STD (45.2%: 14 of 31) followed by genital warts (32.3%: 10 of 31). Among HIV negative men, 43.6% were syndromically diagnosed with genital warts and 40.4% with genital ulcers. Among HIV negative women, 47.8% were diagnosed with genital warts (32 of 67) and 26.9% with genital ulcers (18 of 67).

Table 52. 2002 STD Sentinel Surveillance, STD Symptoms*

Disease	Male			Female			Total		
	Number Tested	No. HIV+	% HIV+	Number Tested	No. HIV +	% HIV+	Number Tested	No. HIV+	% HIV+
Genital Ulcers	56	18	31.0	32	14	45.2	88	32	36.0
Urethral Discharge	16	2	3.4				16	2	2.2
Cervical Discharge				20	6	19.4	20	6	6.7
Genital Ulcer & Discharge	1	-	-	4	1	3.2	5	1	1.1
Genital Warts	79	38	65.5	42	10	32.3	121	48	53.9
Total	152	58	100	98	31	100	250	89	100

*Source: 2002 Sentinel Surveillance AP SACS Report

B. ANC Sentinel Surveillance Data

Out of four hundred women sampled at the Anakapalle antenatal clinic, two were HIV positive (0.5%). Because of the small number of HIV positive individuals, analyses are of limited use. Tables 53 through 57 describe the sociodemographic characteristics and geographic distribution of women who participated in the ANC surveys.

Table 53. 2002 ANC Sentinel Surveillance, Age and Sex Distribution*

Age Group	Female		
	Number Tested	Number HIV+	Number HIV+
Years			
< 20	85	-	-
20-29	308	2	0.64
30-44	7	-	-
> 45	-	-	-
Total	400	2	0.5

*Source: 2002 Sentinel Surveillance AP SACS Report

Table 54. 2002 ANC Sentinel Surveillance, Locale Distribution*

Locale	Female		
	Number Tested	Number HIV+	Number HIV+
Urban	80	1	1.25
Rural	320	1	0.31
Total	400	2	0.5

*Source: 2002 Sentinel Surveillance AP SACS Report

Table 55. 2002 ANC Sentinel Surveillance, Status of Migration*

Status	Number Tested	Female	
		Number HIV+	Number HIV+
Migrated	5	-	-
Non-Migrated	395	2	0.5
Total	400	2	0.5

*Source: 2002 Sentinel Surveillance AP SACS Report

Table 56. 2002 ANC Sentinel Surveillance, Literacy Status*

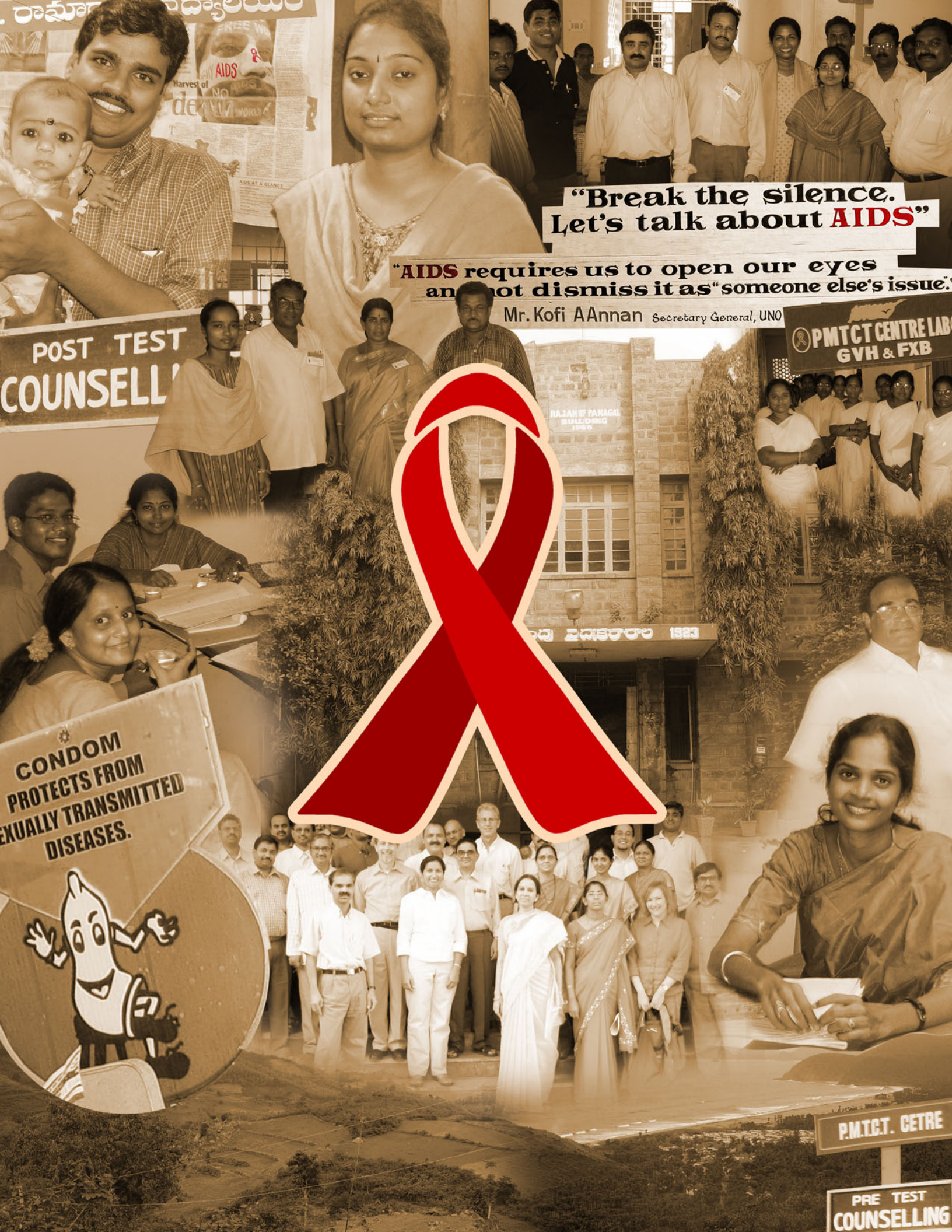
Literacy Status	Number Tested	Female	
		Number HIV+	Number HIV+
Illiterate	175	1	0.56
Literate & till 5 th	109	1	0.91
Till 12 th	102	-	-
Graduate & Above	11	-	-
Total	400	2	0.5

*Source: 2002 Sentinel Surveillance AP SACS Report

Table 57. 2002 ANC Sentinel Surveillance, Occupation of Spouse*

Occupation	Number Tested	Female	
		Number HIV+	% HIV+
Agriculture/Unskilled Worker	297	1	0.3
Truck/Taxi/Auto/Driver/Cleaner	35	1	2.9
Industrial & Factory Worker	7	-	-
Hotel Staff	2	-	-
Service	35	-	-
Business	24	-	-
Unemployed	-	-	-
Student	-	-	-
Total	400	2	0.5

*Source: 2002 Sentinel Surveillance AP SACS Report



"Break the silence. Let's talk about AIDS"

"AIDS requires us to open our eyes and not dismiss it as 'someone else's issue'."

Mr. Kofi AAnnan Secretary General, UNO

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