

HIV/AIDS prevalence among male patients in Kuwait

Rashed A. Al-Owaish, MD, PhD, Shakil Anwar, MBBS, MPH, Promila Sharma, MSc, PhD, Syed F. Shah, MPH, DSc.

ABSTRACT

Objective: To determine the prevalence of human immunodeficiency virus infection among male patients with sexually transmitted disease in Kuwait with emphasis on the type of sexually transmitted diseases and sexual partners.

Method: A sentinel surveillance was conducted among male sexually transmitted disease patients, randomly selected among all new sexually transmitted disease patients who visited the Family Planning Clinic during June 1996 to June 1997. The patient data was recorded by the attending physician on a specially designed questionnaire.

Results: A total of 1984 subjects were screened, out of which not a single human immunodeficiency virus/acquired immunodeficiency syndrome case was found. Among the screened, 69% were non-Kuwaitis. Most of the subjects (76%) belonged to the age group 15-34 years, were married (53%), were illiterate (37.5%) and belonged to the low SES group (70%). The most common sexually transmitted diseases were non-specific urethritis (45%) and gonorrhoea (42%). With regard to sexual practices, the majority of the respondents showed preference for female

prostitutes, both inside (50%) and outside (48%) Kuwait.

Conclusion: The absence of any human immunodeficiency virus positive case was probably due to the mandatory screening for granting residency in Kuwait, facilitating early detection of virus carriers among non-Kuwaitis. We, as researchers, are not sure if this study is true representation of human immunodeficiency virus/acquired immunodeficiency syndrome prevalence among Kuwaiti sexually transmitted disease patients in this country who might seek treatment in private clinics. Moreover, the absence of prostitution as professional trade also tends to show the absence of indigenous circulation of the virus. Nevertheless, continuous surveillance is necessary to maintain and prevent the groups with risky behaviors from contracting the virus through sexual transmission. There is a distinct need to develop public education and awareness programs to serve as measures of prevention and protection.

Keywords: Sexually transmitted diseases, males, Acquired Immune Deficiency Syndrome, prevalence, Kuwait.

Saudi Medical Journal 2000; Vol. 21 (9): 852-859

Groups at high risk of HIV/AIDS infection include those with prior history of sexually transmitted diseases (STDs). Screening high risk individuals, such as STD patients, is useful since the related counseling may change their behavior and keep them free of HIV infection.¹ All major authorities, including American Academy of Family Physicians, American College of Obstetricians and Gynecologists American Medical Association and

Centers for Disease Control and Prevention recommend that HIV/AIDS screening should be offered to patients with suspected STD. In addition, American Medical Association recommends offering testing and counseling to individuals with risky behavior receiving family planning services.²⁻⁴

Early reports from Central Africa linked HIV infection with STD.^{5,6} Since then, studies from around the world have confirmed the association

From the Department of Public Health, (Al-Owaish, Anwar, Shah), Ministry of Health, Office of Vice President Research, (Sharma), Kuwait University, Kuwait.

Received 15th January 2000. Accepted for publication in final form 31st May 2000.

Address correspondence and reprint request to: Dr. Rashed A. Al-Owaish, Director, Department of Public Health, Ministry of Health, PO Box 12227, Al Shamieh 71653, State of Kuwait. Tel. (965) 246 6107/8 Fax. (965) 242 5308 E-mail: promila@kuc01.kuniv.edu.kw alowaish@yahoo.com

between both ulcerative and inflammatory STDs and HIV/AIDS, suggesting a role for STDs in amplifying the risk of infection with HIV/AIDS. Recurrent herpetic ulcers and other genital lesions have been shown to facilitate the transmission of HIV/AIDS.⁷ These associations have been described in both men and women with estimates of risk ranging between three to ten fold from studies in Africa,^{8,9} the United States,¹⁰ Europe,¹¹ and Asia.¹²

Unprotected heterosexual contact in the presence of STDs has been reported to increase the probability of HIV/AIDS transmission in rural Uganda. Given conservative assumption about the prevalence of STDs and their impact on enhancing HIV transmission, STDs have reportedly played a critical role in the rapid and extensive spread of HIV/AIDS infection.¹³ While in Egypt, the overall prevalence of HIV-I infection among the Egyptians with STDs was higher than the cases detected among the foreigners.¹⁴

Kuwait is one of the affluent oil producing Arab countries. It has a population of 2,238,102, and the male:female ration is 1.58:1.¹⁵ The population composition is affected by the ambitious infrastructural projects in the country, necessitating dependency on huge manpower, mainly male in the

working age group, leading to the preponderance of Non-Kuwaiti males in the age group of 15-44 years. Being sexually active, these males could pose risk for STDs transmission. According to the 1995 census, Non-Kuwaiti males in the sexually active period (15-44 years) constitute a high proportion as compared to females in the same age range, with the male to female ratio of 2.6:1.¹⁶ In addition, a large proportion of both Kuwaitis and Non-Kuwaitis frequently travel outside Kuwait, with the likelihood of indulging high-risk behavior. In Kuwait, the number of new STD cases presenting at the STD clinic is increasing. The number of STD cases have increased (Figure 1) from 1,002 in 1991 to 6,043 in 1997,¹⁷ of which gonorrhea amounted to 1,361 (30%) cases and syphilis 73 (2%). The presence of STDs among Kuwaitis and Non-Kuwaitis has been reported since 1958, indicating the disease existence in both population groups. Although all STDs are notifiable, the notification has remained inadequate and incomplete. To solve this problem a Ministerial Decree was issued in 1983, marking STD reporting mandatory, while prohibiting non-specialists from handling STD cases, notifying and referring patient to the Family Planning Center, which is the main

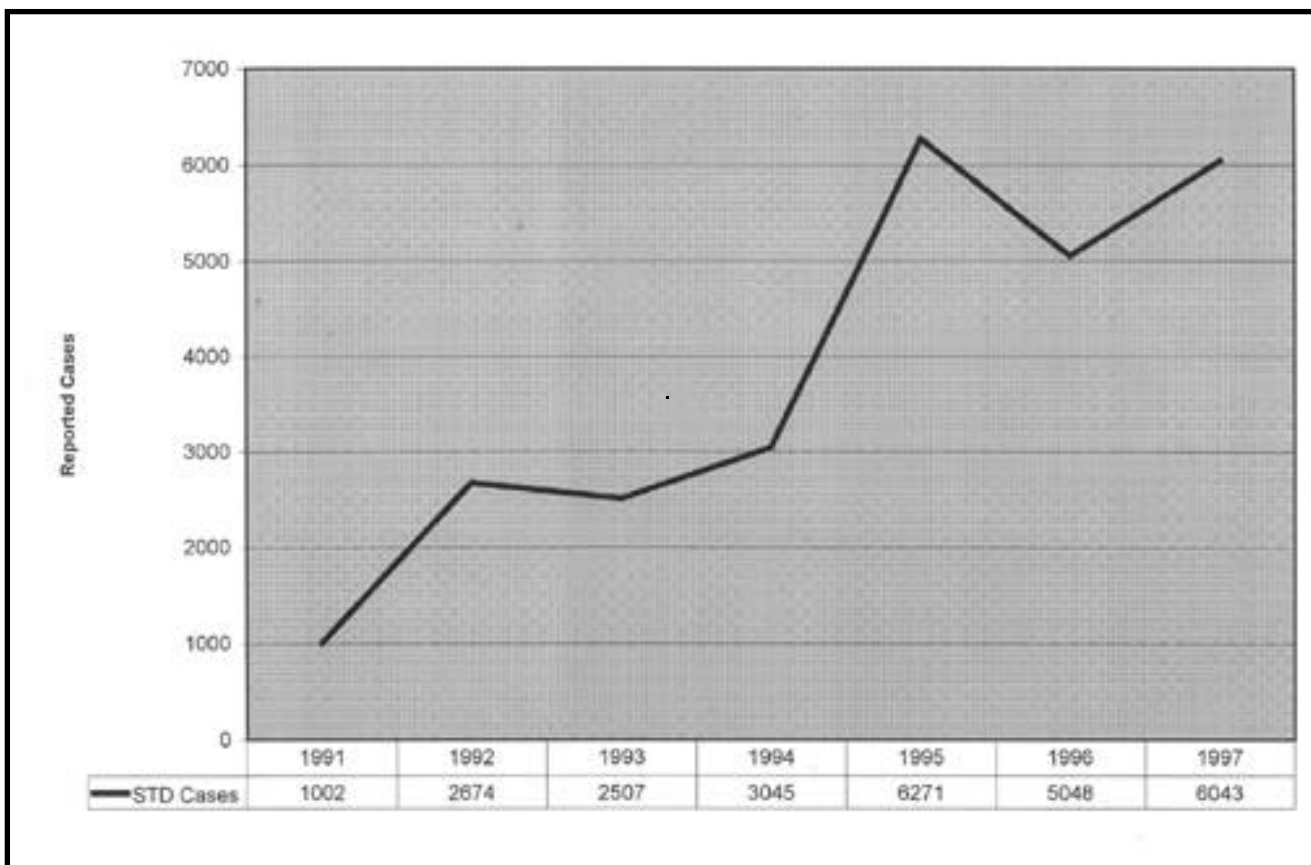


Figure 1 - Reported sexually transmitted diseases (STD) cases at Family Planning Clinic in Kuwait, 1991-1997.

Table 1 - Sociodemographic characteristics among patients attending family planning STD clinic, Kuwait.

Characteristics	Kuwaiti (n=617) Number (%)	Non Kuwaiti (n=1367) Number (%)	All (n=1984) Number (%)	P values
Age in years				
15-24	322 (52.5)	196 (14)	518 (26)	<.0001
25-34	223 (36)	771 (56.5)	994 (50)	<.0001
35-44	45 (7.5)	292 (21.5)	337 (17)	<.0001
45-54	14 (2)	81 (6)	95 (5)	<.0005
55+	13 (2)	27 (2)	40 (2)	NS
Total	617 (100)	1367 (100)	1984 (100)	
Marital status				
Single	362 (58.5)	531 (39)	893 (45)	<.0001
Married	239 (38.5)	818 (60)	1057 (53)	<.0001
Divorced/Widowed	16 (3)	15 (1)	31 (2)	<.0022
Total	617 (100)	1364 (100)	1961 (100)	
Education				
Illiterate	39 (6.5)	700 (51.5)	739 (37.5)	-
Primary/Junior	154 (25.5)	331 (24.5)	485 (25)	<.0001
Secondary	294 (48)	202 (15)	496 (25)	<.0001
Diploma	63 (10)	84 (6)	147 (7.5)	<.01
Diploma/University	60 (10)	42 (3)	102 (5)	<.0001
Total	610 (100)	1359 (100)	1969 (100)	
Occupation				
Unemployed/Student	52 (9)	40 (3)	92 (5)	<.0001
Students	113 (19)	28 (2)	141 (7)	<.0001
Labourer	4 (.5)	703 (53)	707 (37)	NA
Semi skilled	230 (39)	133 (10)	363 (19)	<.0001
Skilled	4 (.5)	319 (24)	323 (17)	NA
Semi professional	183 (31)	76 (6)	259 (13.5)	<.0001
Professional	8 (1)	23 (2)	31 (1.5)	NS
Total	594 (100)	1322 (100)	1916 (100)	
Note: Due to lack of missing variables total number is not equal to sample size of 1984.				

referral center for STDs.

The first AIDS case in Kuwait, diagnosed in 1984, was an adult male with pneumocystis carinii pneumonia. A total of 298,222 tests for HIV were undertaken during the study period June 1996 to June 1997. During this period a total of 74 HIV positive and 2 AIDS cases had been diagnosed. The overall rate of HIV positives during this period was 24.8 per 10.⁵ screened.¹⁸ Majority of the HIV testing (86%) was carried out on expatriates. Among expatriates, HIV testing was mainly carried out for issuing residency permit (65%) which is mandatory for working in Kuwait. Also among the screened, Kuwaitis comprised 12%, mainly screened as a result of testing units of blood donated at the blood bank, employment in government sector, police academy and Ministry of Defense.

Kuwait has had the initial advantage of benefiting from the immense scientific literature, information and knowledge about the modes of HIV transmission before the actual onslaught of the disease in this part of the world. This knowledge created a sense of preparedness to deal with potential AIDS cases. AIDS is a notifiable disease backed by legislation which makes the reporting mandatory. All information concerning HIV seropositivity is strictly confidential according to standard guidelines evolved by the Kuwait National AIDS Committee. A comprehensive AIDS control strategy has been created by the State's concerned sectors, in collaboration with the World Health Organization (WHO) for combating the spread of HIV/AIDS based on the disease's regional and international epidemiology. Although HIV/AIDS have not

Table 2 - Patients attending family planning STD clinic by types of STD and ethnic-group, Kuwait.

Characteristics	Kuwaiti Number (%)	Non Kuwaiti (n=1367) Number (%)	All (n=1984) Number (%)	P values
STD types				
Non specific uratheritis	341 (56)	540 (40)	881 (45)	<.0001
Gonorrhea	216 (35.5)	603 (45)	819 (42)	<.0001
Chancroid	15 (2.5)	115 (9)	130 (7)	<.0001
Herpes	20 (3)	29 (2)	49 (2.5)	NS
LG Venereum	0 (0)	28 (2)	28 (1.5)	*
Venereal warts	9 (1.5)	15 (1)	24 (1)	*
Syphilis	3 (0.5)	7 (0.5)	10 (0.5)	*
Combined STD's	4 (1)	5 (0.5)	9 (0.5)	*
Total (All STD's)	608 (100)	1342 (100)	1950 (100)	
*Numbers are small, p-values were not calculated, NS=Not Significant				

Table 3 - Sexual practices inside Kuwait by nationality among patients attending family planning STD clinic, Kuwait.

Characteristics	Kuwaiti Number (%)	Non Kuwaiti (n=1367) Number (%)	All (n=1984) Number (%)	P values
Sexual practices				
Spouse	128 (29)	72 (7)	200 (13)	<.0001
Girl friend	156 (35)	301 (28.5)	457 (30)	<.0041
Female prostitute	100 (23)	649 (61)	749 (50)	<.0001
Male prostitute	6 (1)	5 (0.5)	11 (1)	*
Combination of above	53 (12)	34 (3)	87 (6)	<.0001
Total	443 (100)	1061 (100)	1504 (100)	
No of sexual partners				
Single	294 (65.5)	904 (84)	1198 (79)	<.0001
Multiple	155 (34.5)	167 (16)	322 (21)	<.0001
Total	449 (100)	1071 (100)	1520 (100)	
*Numbers are small, p-values were not calculated, NS=Not Significant				

Table 4 - Sexual practices abroad among patients attending family planning STD clinic by nationality, Kuwait.

Characteristics	Kuwaiti Number (%)	Non Kuwaiti (n=1367) Number (%)	All (n=1984) Number (%)	P values
Sexual practices				
Yes sex abroad	198 (80)	225 (80)	423 (80)	NS
No sex abroad	50 (20)	55 (20)	105 (20)	NS
Total	248 (100)	280 (100)	528 (100)	
Sexual partners				
Spouse	13 (6.5)	143 (66)	156 (37.5)	<.0001
Girl friend	37 (18.5)	21 (10)	58 (14)	NS
Female prostitute	149 (75)	53 (24)	202 (48.5)	<.0001
Total	199 (100)	217 (100)	416 (100)	
No of sex partners				
Single	126 (61.5)	192 (85)	318 (74)	<.0001
Multiple	79 (38.5)	34 (15)	113 (26)	<.0001
Total	205 (100)	226 (100)	431 (100)	

reached serious dimensions in Kuwait, the country shares a global concern for controlling the spread of AIDS through prevention strategies.

Organized efforts for the management of STDs in Kuwait started in 1958, with the establishment of the Department of Social Medicine, responsible for venereal disease and premarital testing. Within 4 years (1962), it was renamed as a Family Planning Center with wider functions, including the management of infertility and sexual disorders.^{19,20} It is important to mention here that in Kuwait, Family Planning Services are predominantly used by expatriate male patients, while Kuwaiti males go to private clinics for STDs and women patients are traditionally treated at the Gynecology clinics.

In this study, we have attempted to estimate the prevalence of HIV infection among male STD patients who visited the Family Planning Clinic during the period June 1996 to June 1997. The study also aimed at understanding the need for evolving specific protective and preventive programs against HIV infection.

Methods. *Ethics.* Ethical clearance for the project was obtained from the Medical Research Committee, Ministry of Health, Kuwait. Informed

consent of the subjects was obtained from interviewees maintaining their confidentiality and anonymity.

Sample size. The sample size was calculated based on the number of patients who attended the Family Planning Clinic by mid-year 1994-95. A total of 4,658 old and new STD cases presented at the Family Planning Clinic during that time. Out of these 85% were new cases. For this study, the plan was to achieve a sample size of 2,000 subjects who were randomly selected. Hence, for the purpose of the study every other patient became eligible on grounds that he did not visit the clinic more than once with the same STD, or he attended the clinic for reasons other than STD. The selected patient was given a code number through which he could have been traced in case of HIV positive result. The study utilized the current reporting for HIV positive cases in order to do contact tracing and counseling.

Survey instrument. The data was recorded on a specially designed questionnaire, and completed through face-to-face structured interviews. The questionnaire consisted mainly of closed-ended questions and included: sociodemographic characteristics, (age, education, occupation, marital status, nationality and residential area) and history and clinical examination (duration of symptoms,

history of sex inside and outside Kuwait in the last 6 months, type of sexual partners in and outside Kuwait and provisional diagnosis).

The questionnaire was pretested through a pilot study on a sample of 40 patients to determine the adequacy of the instrument, ascertain its applicability and achieve the required sample size within the time frame. It also provided the final opportunity to amend the contents of the questionnaire in the light of comments or reactions from interviewees. To ensure consistency and high quality of the survey data, 4 interviewers, all physicians working at the Family Planning Clinic, were designated for this project. In addition, laboratory investigations (urine routine, urethral discharge smear and culture, blood sample for VDRL, RPR, TPHA and ELISA for HIV) were also included in the questionnaire, and serological examination of blood samples including ELISA method followed by subsequent ELISA in case of positive results based on WHO recommendations.²¹

Socioeconomic status. For determining socioeconomic status (SES), the respondents' education, occupation and residential area constituted the major elements for evolving a 20 point scale. For our purpose, main elements for SES were taken to be occupation with 10 points (distributed among 8 occupational categories with points assigned to each such as: laborers 2, unemployed 3, student 4, retired 5, semi-skilled 6, skilled 7, semi-professional 8 and professional 10), education with 5 points (distributed among 5 categories such as illiterate 0, primary/junior 1, secondary 2, intermediate 3, university 4 and postgraduate 5) and area of residence with 5 points (consisting of Farwaniya 1, Ahmadi/Jahra 2, Hawalli 3 and Capital 5). By computing responses, this scale allowed classification of SES as low for all those who scored between 0-9 points, middle for 10-14 and high for 15 and above.

Statistical analysis. Coded data were keyed into the computer; data analysis was performed using Statistical Package for Social Sciences (SPSS) 7.5 on PC.²² The normal Z-test was used to test the difference between two proportions.

Results. Sociodemographic characteristics. A total of 1984 subjects including Kuwaitis (31%) and Non-Kuwaitis (69%) were included in the study. Every effort was made for full participation from respondents. HIV testing being part of the study was explained to the patients that they would be screened for HIV. Since consent was required based on legislation and law in Kuwait, effort was made to explain to the participants that this was part of research, and would not lead to any ministerial measures or action, except counseling, and that our interest was purely research and counseling. Majority of the subjects were in the age group 15-34 years (76%), married (53%), followed by singles

(45%). Most of the subjects were illiterate (37.5%), and among occupation, laborers constituted the most (37%) Table 1.

Socioeconomic status. By computing and applying the SES scale for education, occupation and residential area, a large majority of the respondents (70%) belonged to low SES.

Type of STDs. Among the screened subjects not a single HIV/AIDS case was found. The most common STDs can be found in Table 2.

Sexual practices in Kuwait. Among the type of sexual partners, female prostitutes constituted the most followed by girlfriend and spouse. These results can be found in Table 3.

Sexual practices outside Kuwait. Sexual practices outside Kuwait showed that the majority of them had sex abroad. The results of sexual practices outside Kuwait can be found in Table 4.

Discussion. This study was explicitly aimed at determining the prevalence of HIV among the male STD patients attending the Family Planning Clinic in Kuwait especially in view of the upsurge of studies from around the world reporting a definite role of STDs in increasing the risk.^{8-12,23-28} These findings tend to establish a strong correlation between STDs and HIV infections, which is further confirmed by HIV sentinel surveillance of STD clinic patients conducted in several countries, indicating a growing increase in HIV positives among the STD patients, and showing a clear link between STDs and HIV.⁵ Contrary to these reports our study did not find a single HIV positive case among the 1984 screened subjects who presented at the STD clinic during the study period. This indicates the probable absence of HIV infection among the STD cases in Kuwait, despite the increase of STD patients in Kuwait during the past 5 years.²⁰

Moreover, studies have shown that HIV and STDs are linked by analogous modes of transmission, common behaviors and similar groups with risky behavior.²⁹⁻³¹ Our sample included only male STD patients, as the Family Planning Clinic in Kuwait is predominantly attended by male patients, while the female patients instead went to the maternity hospital because of the stigma attached to STDs and preferred to discuss these as part of the gynecological problem. This situation makes it difficult to determine the extent and type of STDs or the HIV problem among women. In addition, women are also subjected to antenatal screening for the detection of HIV infection. The HIV/AIDS sentinel surveillance of 848 antenatal tests carried out during the study period, only 1 tested HIV positive.

Majority of males (50%), who attended the STD clinic during the study period, reported sexual contact with female prostitutes. This finding raises concern in view of the fact that prostitution is illegal in Kuwait. Such practices by and large are hidden in

the apparent absence of prostitution being an organized professional group generally involving multiple sexual partners and often leading to the spread of chronic STDs such as genital ulcers, etc. In this regard, females who indulge in these practices in Kuwait are not professional prostitutes, but housemaids, etc., who practice prostitution for small economic gains. Nevertheless, prostitution being illegal, and the females practicing it are already screened for HIV, hence possibility of spreading HIV appears remote. Yet, our data shows that despite the illegality, sexual contact with the female prostitutes accounted for a higher percentage of reported sexual partners (50%) within Kuwait. This finding tends to indicate that prostitution, though illegal, such contacts could not be taken as playing a role in the transmission of viral infection. Hence, chances of infection through sexual frequency with prostitutes are farther limited in Kuwait, since prostitution, as operational trade as found elsewhere,³²⁻³⁴ does not exist. It is, therefore, quite possible that there may not be an indigenous circulation of virus. Nevertheless, the existence of risk can not be ruled out, because STDs among women are treated as part of the gynecological problems. As there are no specialists treating specific STD problems among women, it often leads to chronicity such as chronic pelvic inflammatory disease. This situation requires greater reliance on strategies aimed at preventing groups with risky behavior from contracting the virus through sexual transmission.

HIV screening is mandatory in Kuwait for residency purposes for new entrants. Another mandatory screening is carried out for certain occupational groups for reasons of public health concerns to prevent the transmission of infectious diseases. These groups are continuously monitored on account of the nature of their jobs entailing intensive public dealing. Among such occupational groups are included the food handlers, cleaners, hairdressers, etc., who are annually screened for renewal of their trade license. This group is used as a sample to monitor the circulation of HIV infection, even though they are not groups with risky behavior and are free from HIV. A total of 230,819 HIV tests have been carried out between October 1994 till June 1999 for renewal of residency permits, with the detection of 18 HIV positives.³⁵ These measures make the detection of virus carriers among the expatriate community easier. In fact, the prevailing situation facilitates the early detection of the virus due to the screening process.

Our study does indicate the existence of non-specific urethritis and gonorrhoea as the two most common STDs affecting both Kuwaitis and Non-Kuwaitis, in addition to the other STDs. It is also likely that the associated percentage may not truly reflect the exact dimensions of the STDs infection, especially among the Kuwaitis, who might seek treatment in private clinics. We as researchers are

not sure that if this study is true representation of the HIV/AIDS prevalence among the Kuwaiti STD patients in the country. We feel a strong need exists for seeking the collaboration of private sector clinics in future studies to have a better representation. Also a mechanism needs to be developed to maintain privacy in public sector clinics, which would ensure more Kuwaitis to attend public clinics.

In addition, our preventive strategies such as screening and health education campaigns in controlling HIV among groups with risky behavior appears to be effective. This is based on the observation that our study did not show any HIV case indicating no indigenous circulation of the virus. However, to maintain this situation, and to keep Kuwait free from indigenous transmission of HIV infection, continuous efforts are required to evolve tailor-made programs for enhancing public education and awareness as vital measures of protection and prevention.

Acknowledgments. The authors wish to acknowledge the support from Endowment Fund for Health Development from Public Trusteeship for Endowments which made it possible to conduct this study. We express our sincere thanks to the Director and Health Administration of Al-Sabah Health Area and also to physicians and laboratory technicians at the Family Planning Health Center where this study was conducted.

References

1. Sexually transmitted disease and HIV infection. Clinicians handbook of Clinical Preventive Services. Nurse Pract 1995; 20: 66-71.
2. American College of Obstetricians and Gynaecologist. The Obstetricians-Gynaecologist and Primary-Preventive Health Care. Washington, DC: American College of Obstetricians and Gynaecologist; 1993.
3. American Medical Association. Guidelines for Adolescent Preventive Services (GGAPS). Chicago: American Medical Association, 1992.
4. Centers for Disease Control. CDC Public Health service guidelines for counseling and antibody testing to prevent HIV infection and AIDS. MMWR 1987; 36: 509-515.
5. Kreiss JK, Koech D Plummer FA, Holmes KK, Lightfoote M Poit P et al. AIDS virus infection in Nairobi prostitutes. N Eng J Med 1986; 314: 414-418.
6. Clumeck N, Robert-Guroff M Van de Perre P, Jennings A, Sibomana J, Demol P et al. Seroepidemiological studies of HTLV-III antibody prevalence among selected groups of Africans. JAMA 1985; 254: 2599-2602.
7. Greenblat RM, Lukehart SL, Plummer FA, Quinn TC Critchlow CW, Ashley RL et al. Genital ulceration as a risk factor for human immunodeficiency virus infection. AIDS 1988; 2: 47-50.
8. Martin PM, Gresenguet G, Massanga M, George A, Testa J. Association between HIV-I infection and sexually transmitted disease among men in Central Africa. Res Viral 1992; 143: 205-209.
9. Jessamine PG, Plummer FA, Ndinya Achola JO, Wainberg MA, Wamola I, D'Costa LJ et al. Human Immunodeficiency virus, genital ulcers and the male foreskin: synergism in HIVI transmission. Scand J Infec Dis 1990; 69 (suppl): 181-186.
10. Quinn TC, Glasser D, Cannon RO. HIV-I infection among patients attending clinic for sexually transmitted disease. N Eng J Med 1988; 318: 197-203.

11. Zunzunegui V, Casabona J, Laguna J, Tor J, Ortiz C, Alameda J et al. Risk factors for the heterosexual transmission of HIV from man to woman: A Spanish multicenter study. *Med Clin (Barc)* 1992; 98: 721-725.
12. Nelson KE, Celentano DD, Suprasert S, Wright N, Eiumtrakul S, Tulvatana S et al. Risk factors for HIV infection among young adult men in Northern Thailand. *JAMA* 1993; 270: 955-960.
13. Robinson NJ, Mulder DW, Auvert B, Hayes RJ. Proportion of HIV infections attributable to other sexually transmitted diseases in a rural Ugandan population: simulation model estimates. *Int J Epidemiol (England)* 1997; 26: 180-189.
14. Watts DM, Constantine NT, Sheba MF, Kamal M, Callahan JD, Kilpatrick ME. Prevalence of HIV infection and AIDS in Egypt over four years of surveillance (1986-1990). *J Trop Med Hyg* 1993; 96: 113-117.
15. Public Authority for Civil Information. June 30, 1998, State of Kuwait.
16. Kuwait 1995 Census. Central Statistical Office. Ministry of Planning, Kuwait 1997
17. STD Clinic report of STD statistics 1991-1996. Department of Family Planning Center, Ministry of Health, Kuwait, 1998.
18. Kuwait National HIV/AIDS Surveillance Quarterly Report for WHO, September 1998. Department of Public Health, Ministry of Health, Kuwait.
19. El-Kashlan IM. Trends of sexually transmitted disease in Kuwait. Family Planning Department 1983.
20. Al-Owaish R, Moussa M, Anwar S, Sharma P. Sexually transmitted diseases in Kuwait: Current status and recommendations for control. *J Kuwait Medical Association* 1997; 29: 225-230.
21. WHO Weekly. *Epidem Rec* 1992; 20: 145-149.
22. SPSS 7.5 for Windows. 1997. SPSS Inc., 444 N, Michigan Avenue, Chicago, IL, 60611, USA.
23. Zekeng L, Yanga D, Trebucc A, Sokal D, Salla R, Kaptune L. HIV prevalence in patients with sexually transmitted diseases in Yaounde, Cameroon in 1989-1990; Necessity of an STD Control Programme. *Gen Med* 1992; 68: 117-119.
24. Plummer FA, Laga M, Brunham RC, Piot P, Ronald AR, Bhullar V et al. Postpartum upper genital tract infections in Nairobi, Kenya: Epidemiology, etiology and risk factors. *Inf Dis* 1987; 156: 92-98.
25. Harry TO, Ekenna O, Chikwem JO, Mohammed I, Sakwa M, Adeyera SA et al. Seroepidemiology of human immunodeficiency infection in Borno State of Nigeria by sentinel surveillance. *J Acquir Immune Defic Syndr* 1993; 6: 99-103.
26. Donavan B, Finlayson RJ, Mutimer K, Price R, Robertson M, Nelson M et al. HIV infection in sexually transmissible disease practice in Sydney. *Int J STD/AIDS* 1990; 1: 21-27.
27. Worm A, Kvinseda B. Human immunodeficiency virus surveillance at a sexually transmitted disease clinic in Copenhagen. *Int J STD & AIDS* 1990; 1: 107-109.
28. Carswell JW, Lloyd G. Rise in prevalence of HIV antibodies recorded at an antenatal booking clinic in Kampala, Uganda. *AIDS* 1987; 1: 192-193.
29. Clotey C. Sexually transmitted diseases and human immunodeficiency virus Epidemiology synergy. *STDs in AIDS era* 1993; 7: 755-770.
30. Mertens T, Hayes R, Smith P. Epidemiologic methods to study the interaction between HIV infection and sexually transmitted diseases. *AIDS* 1990; 4: 57-65.
31. Piot P, Tezzo R. The epidemiology of HIV and other sexually transmitted infections in the developing world. *Scan J Infect Dis Suppl* 1990; 69: 89-97.
32. Lye MS, Archibald C, Ghazali A, Low B, Teoh B, Sinniah M, Rus S, Singh J, Nair R. Patterns of risk behaviour for patients with sexually transmitted diseases and surveillance for human immunodeficiency virus in Kuala Lumpur, Malaysia. *Int J STD & AIDS* 1994; 5: 124-129.
33. Simonsen JN, Plummer FA, Ngugi EN, Black C, Kreiss JK, Gakinga MN et al. HIV infection among lower socioeconomic strata prostitutes in Nairobi. *AIDS* 1990; 4: 139-144.
34. Le Bacq F, Mason P, Gwanzura L, Robertson V. HIV and other sexually transmitted diseases at a rural hospital in Zimbabwe. *Gen Med* 1993; 69: 352-356.
35. State of Kuwait HIV/AIDS Surveillance Report for WHO, June 1998. Department of Public Health, Ministry of Health, Kuwait.