Hong Kong STD/AIDS Update

- a quarterly surveillance report

Department of Health Vol.2 No.3 July 1996

Editorial

Into the second half of 1996, the toll of cumulative HIV infections and AIDS in Hong Kong has surpassed 700 and 200 respectively. Thirty-eight HIV cases were reported in the second quarter of 1996, which was close to the highest HIV number (40) recorded previously. The high number of AIDS patients (26) reported this quarter was even more marked. Even though it was partially due to delay in reporting, we have to admit that the increasing trend is genuine and still continuing.

All of the newly reported HIV infections with identified risk factor were due to sexual contacts; about two-thirds related to heterosexual transmission. Of note, in the last quarter, there was a young adolescent girl found infected from sexual contact. The majority of the adolescent infections in Hong Kong have been caused by transfusion of contaminated blood or blood products, during the early 1980s. However, one can imagine that the growing threat of HIV for these young people posed by unprotected sex is worrying.

The impact of HIV to the teens and young adults was already evident in other countries. For example, 18% of the AIDS patients in the United States were of age 20-29. In addition, many of the HIV patients of this age group were believed to have contracted the virus during their teens. Lessons learnt from overseas should alert us to better prepare ourselves for tackling similar problems in the local setting.

Let us turn to the feature article in this issue which is about HIV testing. The editors would like to thank Dr. W.L. Lim, Consultant Microbiologist of the Department of Health, for her comments on the article. Important points on HIV antibody tests, and supplementary test - HIV antigen and polymerase chain reaction - were highlighted. One has to be cautious about the advantages and limitations of tests of advanced technology, and not regard them as the "answer" in all situations.

It has become apparent that the frequency and importance of tuberculosis among our local HIV/AIDS patients is growing. This is not surprising as TB is somehow endemic in our locality. Co-infection of HIV and *Mycobacterium tuberculosis* is a major global public health concern. The exact interactions of these two infections and their impact in individual countries/places will depend on the prevalence of the diseases. In this regard, we are pleased to have, in a supplement of this quarter's update, Professor James Chin of the University of California at Berkeley to enlighten us on the parallel epidemics of HIV and tuberculosis and in particular, their implications in Asia .

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Reported HIV/AIDS Quarterly Statistics

2nd Quarter, 1996

	This Quarter		Cumulative	
	HIV	AIDS	HIV	AIDS
1. Sex				
Male	**31**	**24**	**624**	**196**
Female	**7**	**2**	**78**	**18**
2. Ethnicity/race				
Chinese	**30**	**22**	**478**	**153**
Non-Chinese	**8**	**4**	**224**	**61**
Asian	*5*	*3*	*62*	*21*
White	*3*	*1*	*125*	*38*
Black	*0*	*0*	*9*	*2*
Others	*0*	*0*	*28*	*0*
3. Age at diagnosis				
Adult	**38**	**26**	**678**	**207**
Child (age 13 or less)	**0**	**0**	**24**	**7**
4. Exposure category				
Heterosexual	**22**	**18**	**336**	**100**
Homosexual	**9**	**2**	**187**	**65**
Bisexual	**1**	**0**	**44**	**19**
Injecting drug user	**0**	**1**	**14**	**4**
Blood/blood product infusion	**0**	**1**	**66**	**14**
Perinatal	**0**	**0**	**3**	**2**
Undetermined	**6**	**4**	**52**	**10**
5. Total	**38**	**26**	**702**	**214**

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Quarterly Statistics of STD in Social Hygiene Servic

	2nd Quarter 96	2nd Quarter 95
Syphilis		
Primary	31	13
Secondary	10	5
Early latent	31	32
Late latent	53	56
Late (Cardiovascular/neuro)	2	2
Congenital (early)	0	0
Congenital (late)	0	0
Total	**127**	**108**
Gonorrhoea	563	592
Non-gonococcal urethritis	1456	1062
Chancroid/Lymphogranuloma venereu	1	2
Genital Wart	834	703
Herpes Genitalis	265	154
Pediculosis pubis/Scabies	178	230
Non-specific genital infection	898	1046
Trichomonas/Monilia vaginitis	631	621
Molluscum Contagiosum	44	20
Genital Ulcer	15	19
Others	20	41
Total	**5032**	**4598**

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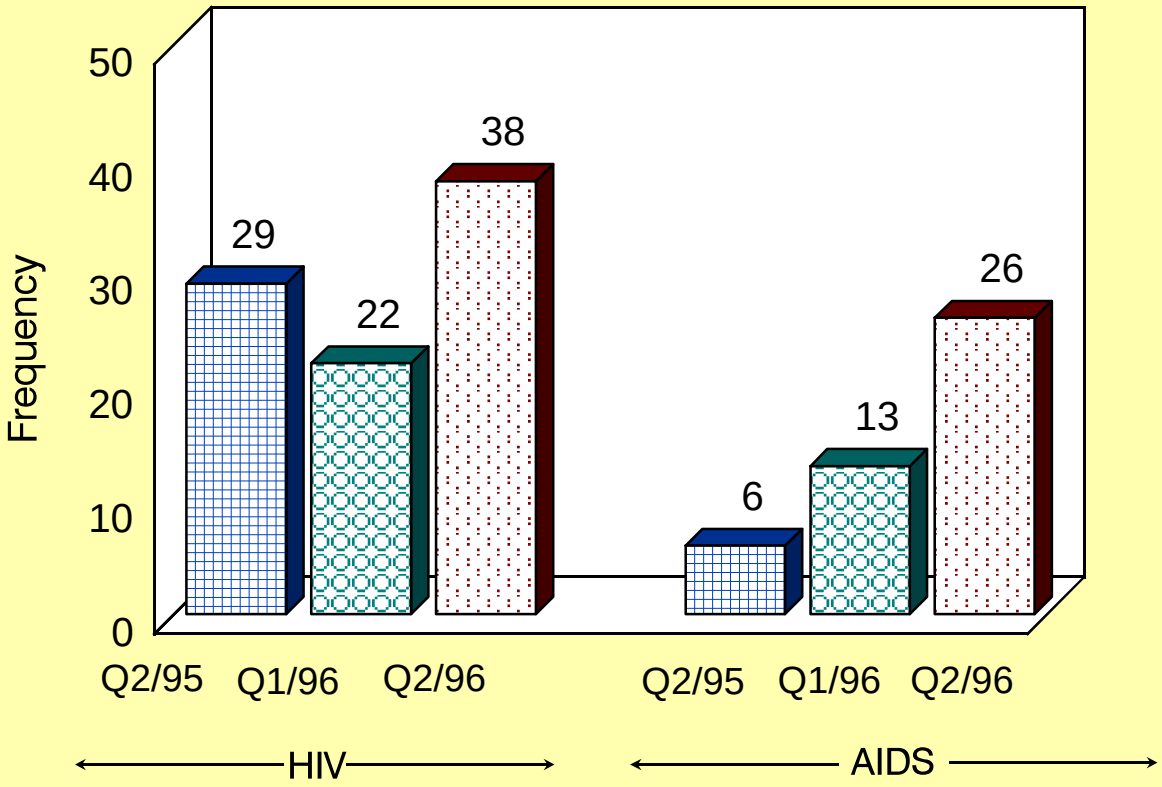
Quarterly Reported HIV/AIDS - 2nd Quarter, 1996



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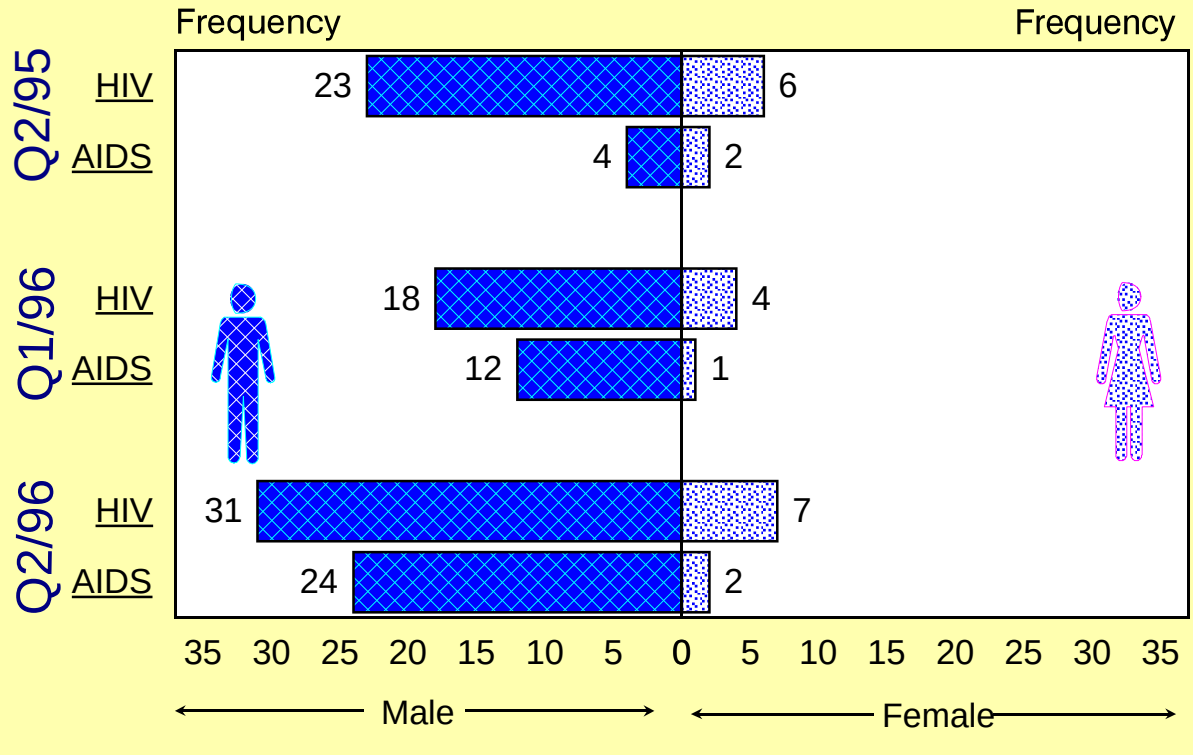
Quarterly Reported HIV/AIDS - By Sex

2nd Quarter, 1996



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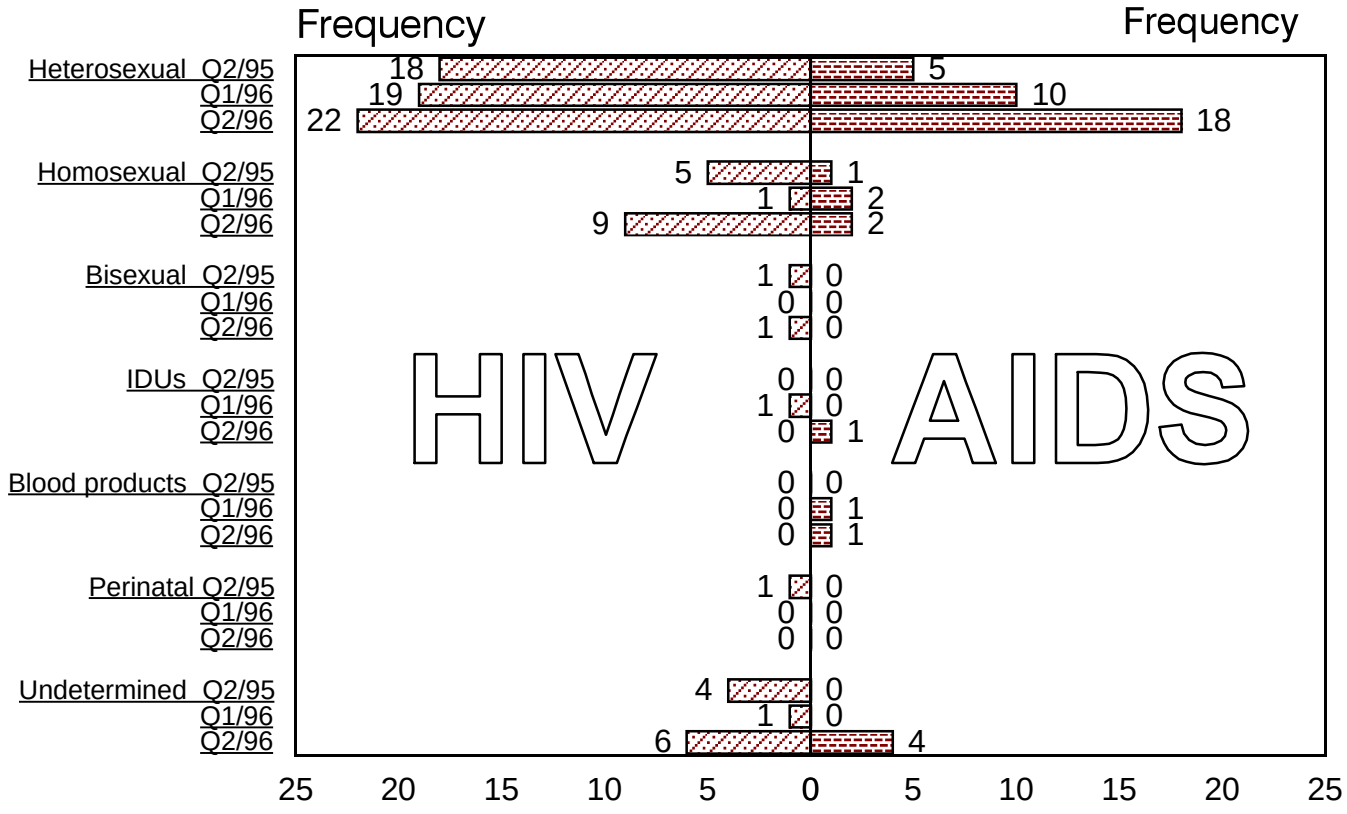
Quarterly Reported HIV/AIDS - By Exposure Category
2nd Quarter, 1996



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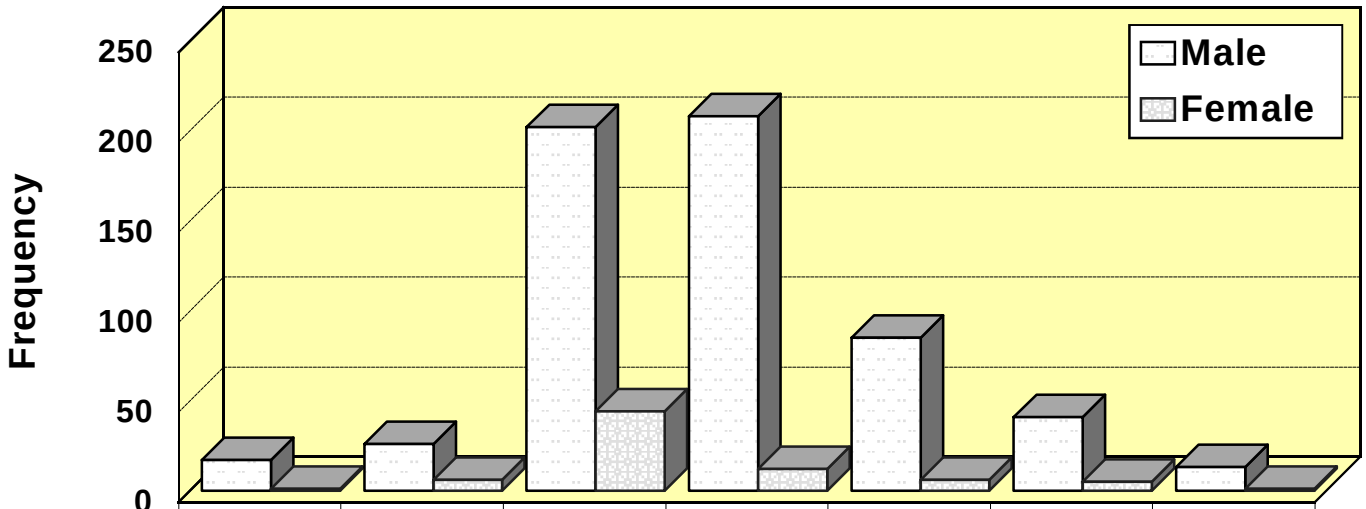
Age/Sex Distribution of HIV Infection in Hong Kong
1984 - June 1996 (n=702)



	0-10	11-20	21-30	31-40	41-50	51-60	>60
Male	17	26	202	208	85	41	13
Female	1	6	44	12	6	5	1

Age

Three women and 32 men of unknown age are excluded.

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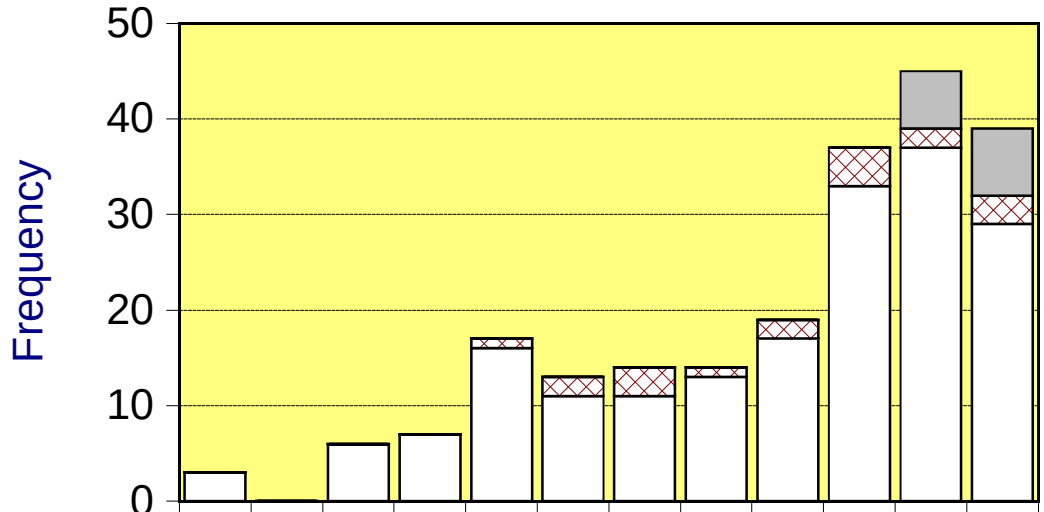
Primary AIDS Diagnosis by Category, 1985 - June 1996



	85	86	87	88	89	90	91	92	93	94	95	96
Pul. TB/TB Cervical LN*	0	0	0	0	0	0	0	0	0	0	6	7
Extrapulmonary TB	0	0	0	0	1	2	3	1	2	4	2	3
Other AIDS-Indicator Conditions	3	0	6	7	16	11	11	13	17	33	37	29

Year of AIDS Reported

* Included as AIDS-indicator condition since 1995, provided that CD4<200/*uL*.

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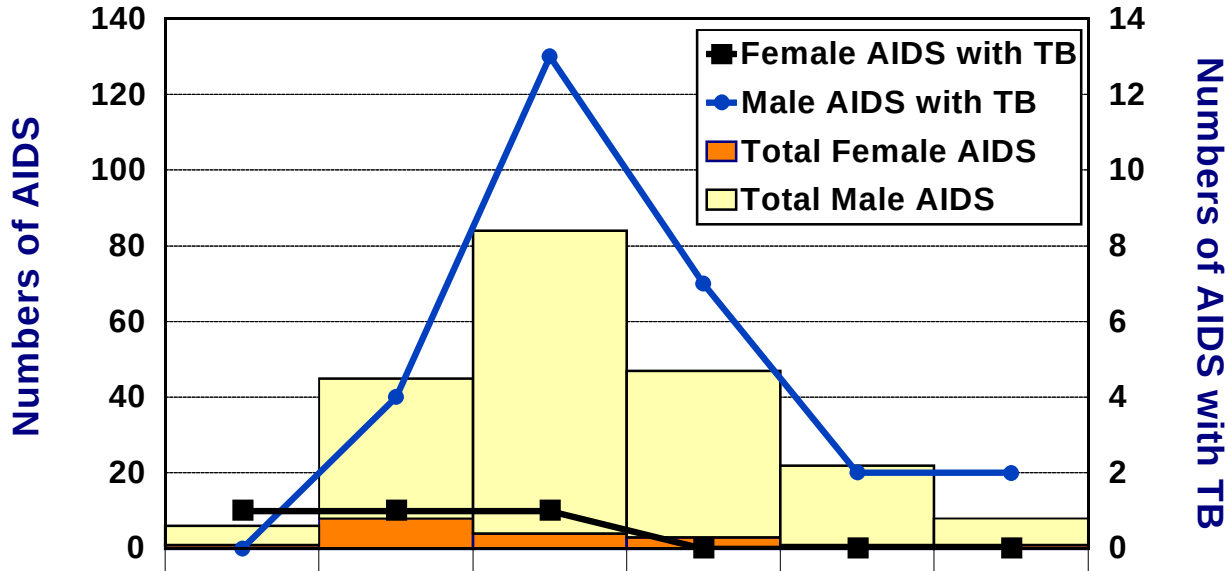
Age/Sex Distribution of Cases with TB as the Primary AIDS Defining Illness, 1985 - June 1996



	11-20	21-30	31-40	41-50	51-60	>60
% of TB in Male	0	11	16	16	10	29
% of TB in Female	100	13	25	0	0	0

Age at AIDS Reported

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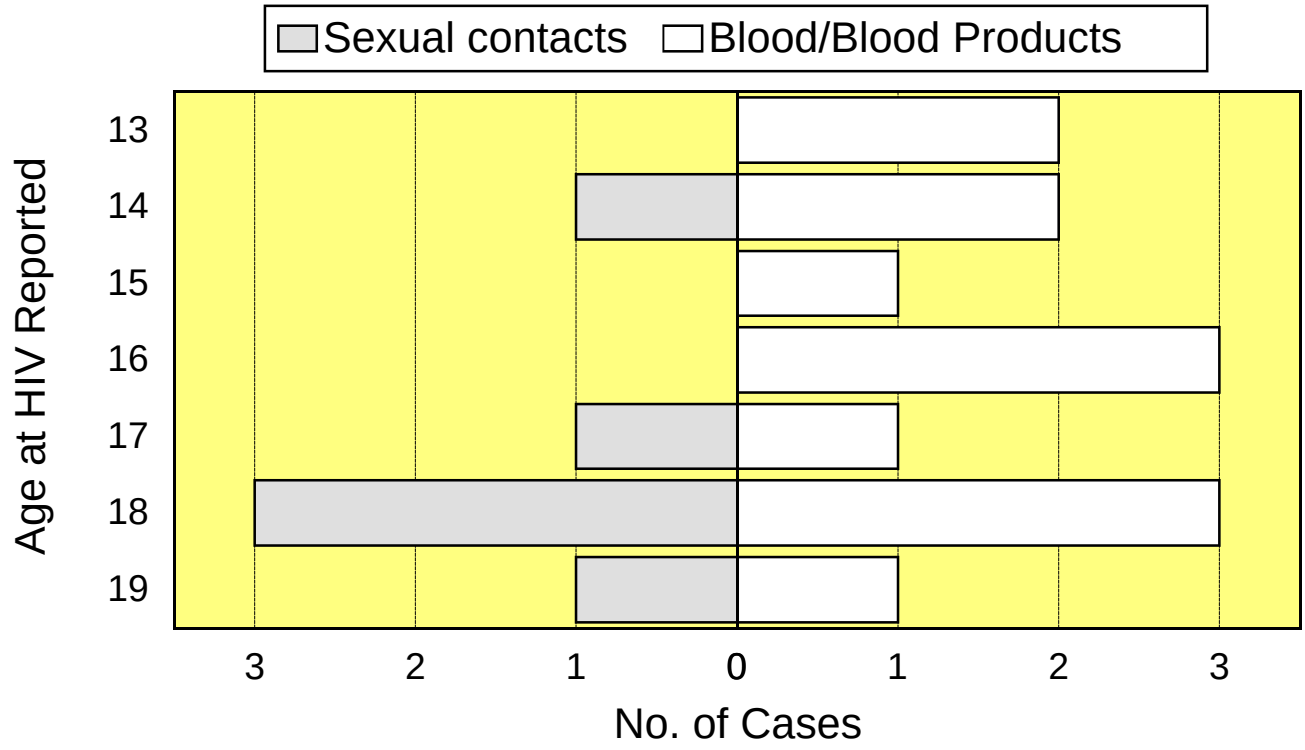
HIV Infected Teenagers - by Age and Risk Factor 1984 - June 1996



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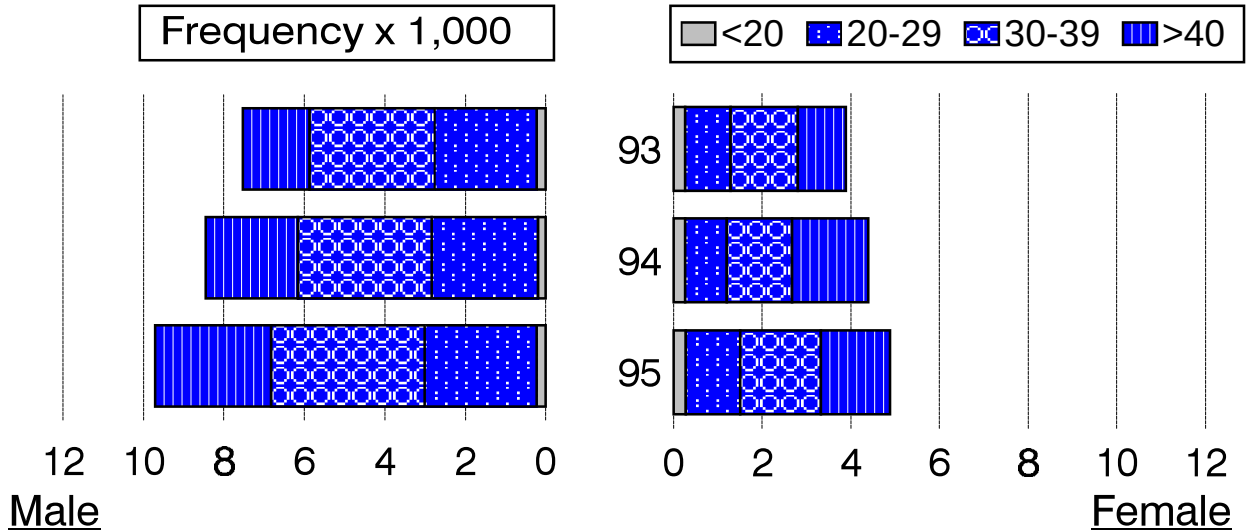
Age Distribution of Cases with Top 5 STDs*, 1993 - 1995



Year / Age	93	94	95	Year / Age	93	94	95
<20	223	200	226	<20	267	260	281
20-29	2543	2641	2785	20-29	1021	939	1219
30-39	3104	3317	3825	30-39	1512	1469	1820
>40	1663	2294	2876	>40	1090	1725	1570

* including syphilis, gonorrhoea, herpes genitalia, genital wart & NSGI/NGU in public social hygiene clinics.

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HIV antibody test

The availability of HIV antibody test in 1985 was an important milestone in the development of global AIDS programme. The test has greatly facilitated the implementation of care and control of HIV/AIDS. One of the major indication of the test is to confirm or refute HIV infection, for people with HIV-related risk behaviours or when patients have clinical presentations suggestive of underlying infection.

The value of HIV antibody to assist medical management of HIV-infected or at risk patients is most obvious. Nevertheless, it cannot be over-emphasized that the test should not be a "routine" test. Whenever indicated, the test should be voluntarily, and performed with informed consent as well as counselling.

Hong Kong has been proactive in the acquisition and application of HIV antibody testing. Screening test followed by supplemental testing is adopted for diagnosis of HIV infection in the public service. Enzyme linked immunosorbent assay (ELISA) and Western Blot (WB) are the most commonly used screening and confirmatory test. Positive ELISA samples can be confirmed free of charge by WB at the government Virus Unit.

One of the limitations of the HIV antibody test is the time taken from infection to the appearance of detectable antibodies in the blood. HIV infection may be missed during this window period when one can be paradoxically more infectious. The average length of the window period for the first generation test (whole-virus-lysate ELISA) is 45 days. With the advent of the more sensitive recombinant protein-based HIV-1 and HIV-2 ELISA, the window period is shortened to a mean of 25 days. Nowadays, it is commonly taken that 97% or more of HIV positive persons will develop detectable antibodies in the first 3 months after infection. Both HIV-1 and HIV-2 are covered satisfactorily with current assays.

Apart from antibody test, there are other measures to detect HIV infection. However, they are only applicable in specific settings. The HIV antigen test is one such example. It is estimated that the mean time for detection of HIV antigen is only reduced by 6 days compared with that of HIV antibody. Also, not all recently infected people have positive antigen result. The routine use of HIV antigen test for HIV diagnosis is therefore not advocated. It can, however, be useful in situations like patients seroconverting with signs and symptoms or in the diagnosis of perinatal infection. On the same token, polymerase chain reaction (PCR), which can detect HIV about 10 days earlier than antibody test is not a useful screening test for HIV. In addition, the use of PCR for HIV detection is technically more demanding.

Up till now, HIV antibody test remains the mainstream approach in diagnosing HIV infection, and it is supplemented by other tests as specifically required. No matter which method is used, the same guiding principles for HIV testing should always be observed.

Hong Kong STD/AIDS Update can be viewed via the Internet at :
http://www.info.gov.hk/health/aids.

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The Parallel Epidemics of AIDS and Tuberculosis

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Abstract

Modelling of the interaction between the human immunodeficiency virus (HIV) and Mycobacterium tuberculosis (Mtbc) infections provides useful estimates and projections of the additional clinical tuberculosis (TB) cases that may be expected annually in different epidemiologic situations. The prevalence of Mtbc infection in most Asian countries is relatively high, but HIV prevalence levels in most Asian countries are still relatively low (<0.1% to over 2%). After the mid-1990s increases of 50% to 100% over the pre-HIV epidemic number of annual clinical TB patients can be expected in Thailand, parts of India, Myanmar, and Cambodia where HIV rates are currently about 2%. Asian countries/areas such as Hong Kong with relatively low HIV prevalence (<0.1%) as of the mid-1990s will only have modest increases of TB cases related to HIV infection during the remainder of the decade.

Key words: **HIV, TB, modelling, estimates, projections**

Introduction

Potential interactions between the human immunodeficiency virus (HIV) and other infectious disease agents have caused great medical and public health concern. The major interaction identified so far is with *Mycobacterium tuberculosis* (Mtbc) infection. Prior to the advent of HIV epidemics, tuberculosis (TB) was and continues to be a major public health problem throughout the world, especially in developing countries. In populations where the prevalence of infection with Mtbc and HIV are both very high, huge increases in annual numbers of TB cases can be expected. In early 1996, over 10 million adults worldwide are estimated to be infected with both HIV and Mtbc - the vast majority in sub-Saharan Africa, south and southeast Asia.

Natural History of Mtbc and HIV Infections

Initial (i.e., primary) infection with Mtbc, is acquired primarily via airborne dissemination from persons with pulmonary or laryngeal tuberculosis, and usually goes undetected. Early lung lesions commonly heal and leave no residual changes except occasional pulmonary or tracheobronchial lymph node calcifications. About 5% of infected persons progress rapidly to pulmonary disease (TB) within the first year after primary infection (early progressive disease), and another 5% progress to active disease over the remainder of their lives (reactivation disease).

HIV is primarily a sexually-transmitted disease agent. Initial infection with HIV is indicated by the presence of antibodies often without any other signs or symptoms though a substantial minority experience a short, mononucleosis-like illness about 2 to 5 weeks after infection. Progression to symptomatic disease is highly variable and rarely may occur within a year, or take more than 10 years. As of 1996, it is believed that the median period to development of severe immune deficiency as measured by a CD4+ cell count of less than 200/mm^3 may be about 8 to 10 years. Over time HIV-infected persons develop clinical disease related to progressively increasing immune deficiency: early symptoms may include swollen lymph nodes, night sweats, fever, diarrhea, profound weight loss, fatigue, and uncommon infections. Continued progression leads to AIDS which is characterised by life-threatening opportunistic infections and cancers. Survival after onset of severe illness is also variable, but limited. In most developed countries average survival after the diagnosis of AIDS is now about 2-3 years; in developing countries, usually less than 1 year.

Human pathogens that are normally controlled by the cellular immune system are most commonly seen in "HIV disease": viruses, fungi, parasites, and mycobacteria. A number of these "opportunistic" infections are caused by reactivation of existing infections that were acquired much earlier in life like Mtbc. Others reflect those pathogens that exist in the "community" environment, yet others may be rare and found mainly among the immunosuppressed. Persons with latent Mtbc infection who are also infected with HIV develop clinical tuberculosis (TB) at an increased rate. Instead of a 10% lifetime risk of developing TB, 60% to 80% of adults with dual infections may develop TB. Clinical studies have shown that dually infected persons develop clinical TB (pulmonary or disseminated) when their CD4 cell counts are moderately depressed (about 350/mm^3). This contrasts with *Pneumocystis carinii* pneumonia which usually occurs in HIV-infected persons with less than 200 CD4/mm^3. There are no conclusive data to indicate that any infections, including Mtbc infections, accelerate progression to the development of AIDS in HIV-infected persons.

Public Health Implications

The public health implications of the interaction between HIV and Mtbc infections are clear. The increase in HIV-related TB cases expected in populations with high prevalence levels of both infections will overwhelm existing public health and medical care systems since, in most instances, such systems were inadequate for the management of their annual TB case load before the HIV epidemic.

Models of the interaction between HIV and Mtbc infections provide useful estimates and projections of the additional TB cases that may be expected annually in populations with different prevalence levels of these infections. In populations such as in sub-Saharan Africa, where adult HIV prevalence rates are as high as 10% to 20% and Mtbc infection rates exceed 50% in adults 20-49 years of age, the annual number of adult TB cases can be expected to increase by 10 to 20 fold during the latter half of this decade. Although the prevalence of Mtbc infection among young and middle-aged adults in most Asian countries is relatively high (ranging from 25% to over 40%), adult HIV prevalence levels in Asian countries are much lower and range from less than 0.1% to over 2%. In Thailand where adult HIV prevalence was estimated in 1995 to be over 2% and where the adult prevalence of Mtbc infection is about 35%, annual TB cases are projected to double by the year 2000. In Hong Kong where the prevalence of adult HIV infection in 1995 was estimated to be less than 0.1% and where the prevalence of Mtbc in adults is about 30%, the annual increase of TB cases by the year 2000 is projected to be no more than 2% to 3%.

Public health and health care systems need to prepare for the increase in TB cases that will be related to the HIV pandemic. In sub-Saharan Africa, this means developing additional resources to cope with huge increases on the order of 10-20 times the pre-HIV levels. In several southeast Asian countries, the currently documented HIV epidemics can be expected to double the annual number of TB cases within the next several years.

Based on available studies, it is difficult to reach any firm conclusions regarding the relative infectiousness of HIV-related TB patients. HIV-infected TB patients develop a higher proportion of extra-pulmonary disease, that is less infectious than pulmonary disease, and thus, they may be, on average, less infectious than HIV-negative TB cases. No special isolation precautions are needed for nosocomial or community management of HIV-positive TB patients. Nevertheless, the projected huge increase in HIV-related TB during the 1990s in sub-Saharan Africa and in several countries in southeast Asia will increase the annual risk of Mtbc transmission to both HIV-positive and HIV-negative adults. In populations, where HIV prevalence is low (i.e., Hong Kong), secondary spread from HIV-related TB will account for only a small fraction (1% to 2%) of total Mtbc transmission that would occur in the absence of any HIV infections.

In any given population of Mtbc bacilli there will be some mutants naturally resistant to a specific drug. Exposure to a drug does not induce mutations, it merely allows those resistant mutants already present to flourish. Thus, in populations where the annual incidence of TB cases is increasing, the emergence or increase in multi-resistant Mtbc will not be due to HIV-related TB cases per se, but rather to the increase in inadequately treated TB cases that can be expected in countries that already have inadequate resources to cope with their current TB case load. The treatment of TB in HIV-infected persons is considered to be as effective as in persons without HIV infection. In both situations, there is a need to supervise the entire treatment regimen carefully and to use adequate combinations of antituberculous drugs that are appropriate for the region. However well TB in HIV-infected persons may respond to treatment, the survival of dually infected persons will be relatively short once they develop severe immune deficiency or AIDS.

Compared to sub-Saharan Africa, epidemic spread of HIV was not documented in any Asian country until about a decade later, i.e., during the late 1980s. As a result, TB

cases related to HIV infection began to appear in some Asian populations only in the early 1990s. After the mid-1990s, large increases in the number of TB patients can be expected in several Asian countries, especially Thailand, India, Myanmar, and Cambodia. Most other Asian/Pacific countries with relatively low HIV prevalence (<0.1%) as of the mid-1990s, will have only modest increases in TB cases related to HIV infection during the remainder of this decade.

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