PostScript

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HIV transmission among men who have sex with men through oral sex

While the risk of transmission through oral sex for men who have sex with men (MSM) is low, discrepancies remain between study findings and there is uncertainty about the exact degree of risk.[1]

Between July 2001 and September 2003, a total of 4150 MSM were newly diagnosed with HIV infection in England, Wales, and Northern Ireland and reported to the Communicable Disease Surveillance Centre in London. Reports for 1359 cases received during this time included the question ''Does the patient believe himself to have been infected through oral sex?'' The remaining 2791 cases had only laboratory reports or earlier clinician report forms where this question was not asked.

The oral sex question was answered for 688 (50.6%) of the 1359 cases, of which for 625 (90.8%) the response was no, and yes for 63 (9.2%) cases. For 671 cases this information was not recorded even though the question was included on the form.

All 63 cases where the patient believed himself to have been infected with HIV through oral sex were further investigated by a discussion with the clinician or healthcare provider. From these further discussions during the follow up, 27 (42.8%) cases were believed to have been infected from unprotected anal intercourse. Of the remaining 36 cases, 16 (2.3%) claimed to have had only oral sex as their risk for acquiring HIV, with 20 (2.9%) cases always reporting protected anal sex but unprotected oral sex. Previous negative testing history and HIV status of partners was taken into account when discussing possible HIV risk with clinicians or healthcare providers.

It is difficult to quantify oral sex risks and this could be an obstacle to accuracy[1–3]; none of these individuals were re-interviewed for this study and risk was assessed by clinician and note review only. There may be recall difficulties surrounding condom use, including whether they were used, or if used, coming off or splitting, or brief anal-penile contact that was not considered relevant or remembered. In addition, there was limited information about whether ejaculation had occurred or about breaks in the oral mucosa. However, 16 cases reported no anal sex and 20 cases reported only protected anal sex and unprotected oral sex. In total this represents 5.2% of those MSM reports where the question was answered. We are aware that, for half, the question was not answered, and if we classified those reports as not infected through oral sex, then 2.6% (36 of 1359) were probably infected through this route. The indication given by these UK surveillance data is that oral sex carries a small but real risk.

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The correct approach to modelling and evaluating chlamydia screening

A recent systematic review of economic evaluations suggests that screening for genital chlamydia infection is ''cost effective.''[1] We are concerned about how the authors reached this conclusion since the reviewers did not take into account the fact that *Chlamydia trachomatis* is infectious. The methodological problems arising from this fundamental flaw raise questions about the validity of the conclusion.

The correct model to use in the evaluation of an infectious disease must be capable of encompassing all its effects, including the potential for transmission. Bernoulli first reported such transmission dynamic models in the 18th century.[2] The wide misuse of static, as opposed to transmission dynamic, models has been noted in the economics literature on vaccination programmes,[3] but the message has been slow to transcend to the economics literature on sexually transmitted infections, with a few notable exceptions.[4] In the case of screening for genital chlamydia, someone who is successfully treated might be re-infected; the benefits of treatment in preventing long term sequelae will be lost, and the person could continue to infect others. If they are successfully treated without re-infection, however, they will not transmit infection. Since the two possibilities have opposing effects on the number of cases, the direction of change in the cost effectiveness ratio is uncertain; it could overestimate or underestimate the true cost effectiveness. Economic evaluations that do not incorporate these effects are, therefore, very unlikely to model the outcomes of a chlamydia screening programme accurately.

Although the use of objective criteria to assess the quality of identified papers was praised in a recent *STI* editorial,[5] the checklist used by Honey *et al*[1] is outdated and was not applied appropriately for an infectious disease. This led the authors to include papers whose results might be unreliable. The use of more recent and widely used guidelines, which ask questions about the choice of model type and the justification for the key parameters on which the model is based,[6] may have drawn attention to the problems of static models. Furthermore, the review included studies that used ''cost per case detected,'' which is an inadequate outcome for screening programmes because it does not take into account resource implications associated with the course of action taken by individuals after case detection.

We have recently concluded our own systematic review of economic analyses of screening programmes for genital chlamydia infection, as part of the ongoing Chlamydia Screening Studies project (ClaSS). While the majority of studies we identified had used an incorrect modelling approach, we did identify a full economic evaluation that had used a dynamic model to evaluate chlamydia screening. This was identified by Honey *et al*. but excluded because they thought that it did not fulfil their inclusion criteria.[1]

We propose that all future economic evaluations of chlamydia screening should use a dynamic modelling approach. A consensus panel to develop guidelines for the conduct of economic evaluations of interventions for sexually transmitted infections could take this recommendation into account.[6]

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Conflict of interest: The authors are all members of the Chlamydia trachomatis Screening Studies (ClaSS) Working Group. Part of the remit of this group is to conduct a systematic review of economic studies of *Chlamydia trachomatis* screening and to construct a model with which to evaluate the cost effectiveness of chlamydia screening.

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Sciences for the year 1760: an attempt at a new analysis of the mortality caused by smallpox and the advantages of inoculation to prevent it. In: Bradley L, ed. *Small pox inoculation, an eighteenth century mathematical controversy. Translation and critical commentary*. Nottingham: University of Nottingham, 1971.
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Haryana state in India, still a low HIV prevalence state

In Haryana, India, with a geographical area of 27 632 square miles, an HIV sentinel surveillance was carried out, on a regular basis (1998–2002), on consecutive serum samples of 400 antenatal clinic (ANC) attendees (three sites) and 250 sexually transmitted diseases (STD) clinic attendees (four sites). This was done for each 12 week period per year as unlinked anonymous testing with one of the ELISA/rapid/simple tests. A sample that was positive with two tests of different assays was considered HIV positive. The other STDs were diagnosed clinically and using appropriate laboratory tests.[1 2]

Of the 7933 men and women who participated in the HIV sentinel surveillance from 1998–2002, 15 (0.3%) of 5200 ANC attendees and 48 (1.8%) of 2733 STD clinic attendees had HIV. Though HIV prevalence is still below 1% among the ANC attendees, a gradual increase over these 5 years has been observed though statistically it was not found to be significant (table 1). With increasing HIV infection among antenatal women, paediatric AIDS is poised to become an important public health problem.[3 4]

The odds ratios (ORs) of HIV infection for men compared to women decreased by age; men aged 20–29 years were nearly thrice as likely as women the same ages to be HIV infected (OR 2.68 (95% CI 1.1 to 6.7)). When we combined the literacy status for both men and women, the HIV prevalence was statistically significant among the literate of more than fifth grade (p value = 0.0416) but was not found to be significant when combined for ANC attendees. School or college education, therefore, does not have any impact on this epidemic. Emphasis has to be given to educate the general public about AIDS.

Among the STD clinic attendees presenting with genital ulcer, HIV reactivity (3.9%, 7/181) and VDRL reactivity (11.6%, 21/181) were found to be statistically significant ($p<0.05$, χ^2 test used). Therefore, in India, where the overall level of HIV is still low, a high level of STDs in certain states makes for a continuing potential for the epidemic to become generalised among all sexually active adults. Differences across the states may just be a matter of time.[4]

As per the sentinel surveillance data in the year 1998, there were seven moderate prevalence states (prevalence among ANC attendees <1% but prevalence among the STD clinic attendees >5%) and 19 states were of low prevalence compared to two states only with moderate prevalence rates and 24 states

Table 1 HIV prevalence rates for the attendees tested in sentinel surveillance programme, 1998–2002

	Antenatal clinic attendees			STD clinic attendees					
	HIV reactive			Men		Women			
Characteristics	%	(No)*	p Value	%	(No)	%	(No)	Men/women ratio (95% CI)	p Value§
Age groups (years)									
15–19	0.3	(383)	ns†	1.8	(113)	0	(57)	–††	ns
20–29	0.3	(4171)	ns	2.5	(756)	0.9	(639)	2.68 (1.1 to 6.7)	0.0272
30–44	0.2	(630)	ns	2.8	(432)	1.3	(547)	2.80 (1.1 to 6.9)	ns
>45	0	(16)	ns	1.5	(132)	0	(57)	–	ns
Sentinel year									
Feb-Mar 1998	0	(400)	ns						
Aug-Oct 1998	0	(400)	ns	3.3	(211)	3.1	(32)	1.06 (0.1 to 0.3)	ns
Aug-Oct 1999	0	(400)	ns	5.7	(123)	0	(10)	–	ns
Aug-Oct 2000	0.08	(1200)	ns	2.2	(274)	2.3	(221)	0.97 (0.3 to 3.1)	ns
Aug-Oct 2001	0.4	(1200)	ns	1.5	(410)	0.7	(454)	2.21 (0.6 to 8.8)	ns
Aug-Oct 2002	0.6	(1600)	ns	2.2	(415)	0.7	(578)	3.13 (1.0 to 10.1)	0.0434
Residence	(2001–2)			(2000–2)					
Urban	0.4	(1573)	ns	1.0	(543)	1.0	(659)	0.87 (0.3 to 2.7)	ns
Rural	0.7	(1227)	ns	2.5	(515)	1.2	(630)	1.99 (0.8 to 4.8)	ns
Population	(2001–2)			(2002)					
Migrant	0.9	(224)	ns	0	(23)	0	(41)	–	ns
Non-migrant	0.5	(2576)	ns	2.3	(392)	0.7	(537)	3.08 (1.0 to 9.9)	0.0469
Literacy status	(2001–2)			(2002)				2002	
Lliterate	0.5	(859)	ns	0	(88)	0.9	(220)	–	ns
Literate till 5th grade	0.6	(524)	ns	3.1	(65)	0.9	(114)	3.51 (0.3 to 37.9)	ns
Literate till 12th grade	0.5	(1173)	ns	2.1	(193)	0.5	(184)	3.81 (0.4 to 33.8)	ns
Graduation not done	0.4	(244)	ns	4.3	(69)	0	(60)	–	ns
Occupation of spouses†	(2001–2)			(2002)					
Business	0.4	(435)	ns	1.8	(56)			–	ns
Industrial and factory workers	0.3	(325)	ns	3.0	(33)	20.0	(5)	0.15 (0.0 to 2.1)	ns
Service	0.2	(539)	ns	1.1	(94)	0	(29)	–	ns
Agriculture and unskilled workers	0.7	(1241)	ns	1.3	(153)	0	(10)	–	ns
Truck/auto/taxi driver	0.6	(160)	ns	16.7	(18)	0	(1)	–	ns
Hotel staff	0	(6)	ns	0	(1)			–	ns
Unemployed	0	(60)	ns	0	(15)	0.6	(522)	–	ns
Students	0	(34)	ns	2.2	(45)	0	(11)	–	ns
Syndrome									
Genital ulcer				2.5	(403)	2.7	(148)	0.92 (0.3 to 2.9)	ns
Urethral/cervical discharge				1.0	(511)	0.9	(1043)	1.13 (0.4 to 3.4)	ns
Genital ulcer and discharge				3.4	(59)	1.5	(66)	2.24 (0.2 to 24.0)	ns
Genital warts				2.4	(85)	0	(32)	–	ns

*Number of attendees.
†Among the antenatal clinic attendees, the majority of the occupations stated are those of the spouses with only occasional women having in that occupation.
p Value >0.05 (ns† = not significant) in all the characteristics (χ^2 test used).
††Men/women ratio (95% CI) couldn't be calculated.
§p Value for test between sexes (χ^2 test used).

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with low HIV prevalence rates (prevalence among the STD clinic attendees <5%) in the year 2001 while six states stayed as high prevalence states (prevalence among ANC attendees >1%). Haryana is still maintaining itself in a low level epidemic category. It is speculated that the effect of STD control and screening of ANC attendees for HIV transmission may decrease with the maturation of the HIV epidemic as experienced in trials in Tanzania and Uganda.[5] Therefore, we should increase intervention programmes in all high risk groups as well as in the general population of this city while it is still in the early epidemic phase to ensure that this cost effective opportunity is not missed.

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Increased numbers of acute hepatitis C infections in HIV positive homosexual men; is sexual transmission feeding the increase?

Although the principal mode of hepatitis C (HCV) transmission in the United Kingdom is injecting drug use (IDU), the risk for a third of infections is unknown.[1] The contribution of sexual transmission between men who have sex with men (MSM) to the spread of hepatitis C is unclear, however evidence is accumulating that both co-infection with HIV[2] and the presence of other sexually transmitted infections (STIs) facilitate sexual transmission of HCV.[3] With the reported increases in unsafe sex and STIs in HIV positive MSM we questioned whether these circumstances may lead to an increase in the number of HCV infections.

This study was undertaken to determine whether within our clinics, changes in the number of individuals being diagnosed with acute HCV infection were occurring and to ascertain risk factors for acquisition in these individuals.

A case note review of all patients within the HIV and sexual health clinics of St Stephen's Centre with diagnosed acute HCV infection between January 1997 and December 2002 was performed. Patients newly diagnosed with HCV were identified from departmental computer records. Cases were defined as individuals with a newly positive and a previous negative HCV antibody test. Where negative tests had been performed more than a year earlier, testing of stored samples was undertaken to determine more precise timing of HCV seroconversion. Testing was done using the Monolisa anti-HCV version 2 enzyme immunoassay.

Twenty six male (all MSM) and one female case were identified; median age was 34 years. Twenty five individuals were HIV positive. The median time between negative and positive HCV antibody tests was 5 months (interquartile range 3–10 months). There was a significant increase in HCV seroconversions over the study period (see fig 1).

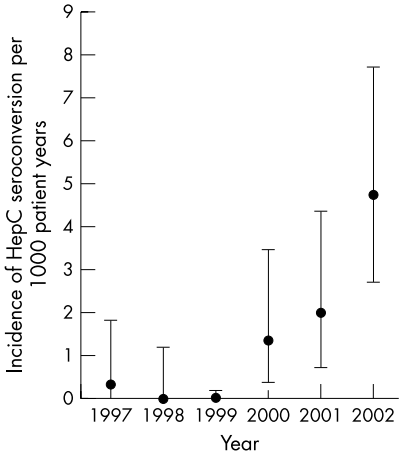

Figure 1 Changing incidence of documented HCV seroconversion. Test for trend p value using Poisson regression p<0.001. Error bars are 95% CI. Date of seroconversion was taken as the date of the first positive HCV antibody test.

The indications for HCV testing were the development of abnormal alanine transaminase (ALT) (21), recent IDU (two), sexual contact with HCV positive partner (one), and symptomatic seroconversion (three). Of those tested because of newly abnormal liver function tests (LFTs), 18 were asymptomatic. LFTs were performed as part of routine HIV follow up. There was no increase in HCV tests performed in HIV positive individuals with ALT levels more than 100 IU/l over the study period; however, the percentage of positive HCV tests increased from 0.6 to 9.3 (p value using χ^2 test for trend: <0.001).

Risks for acquisition of HCV were recent unprotected anal or vaginal sex (21) and IDU (two), while in four there were no documented risk factors. Nine individuals were diagnosed with infectious syphilis either concurrently (three) or in the year before HCV seroconversion. Of the HIV positive patients 15 were on antiretroviral therapy (ARV) and 11 had a viral load of less than 50 copies/ml. The median CD4 count was 359 cells $\times 10^6$/l.

Having multiple sexual partners, a history of STIs, and certain sexual practices have been associated with HCV infection. Reported increases in HCV seroconversion among HIV positive MSM in association with high risk sexual behaviour (unprotected anal sex, fisting, and rimming) suggests an interaction between HIV and sexual practice.[4] As HCV plasma viraemia is higher in co-infected patients[5] and correlates with that in saliva and semen, this may facilitate sexual transmission of HCV. Furthermore, there is evidence that ARV treatment may be associated with increases in HCV RNA levels.[6]

While retrospective assessment of factors may be problematic, features of this study make us more confident of attributing risk to sexual activity. Data were collected in both general HIV and specialist hepatitis clinics, and also most patients were under long term follow up allowing cumulative recording of risks particularly those relating to IDU.

Although it is possible that increased numbers result from changing HCV testing thresholds there was no evidence of this when we examined HCV tests performed to investigate those with abnormal LFTs, the commonest scenario leading to diagnosis. As the ALT trigger was present in the HIV positive group and not in the sexual health clinic attendees, the numbers from this source may be under-represented.

Determining the associated factors for transmission of HCV is critically important in order to introduce targeted screening and prevention interventions. As 85% of infected patients become chronic carriers and treatment of acute hepatitis C leads to high clearance rates, these strategies may be crucial in reducing the carrier pool of HCV, further transmissions and the risk of cirrhosis and hepatoma.

The study numbers are small and may represent a pocket of infection not indicative of increased risks in larger populations. However, the manner in which these infections parallel recent increases in STIs gives cause for the concern that risks may be more generalised. Further studies are needed to clarify this trend.

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Transmission of *Neisseria gonorrhoeae* from a toilet seat

In August 2003 a prepubescent 8 year old girl presented with a sudden onset history of a non-irritating, odourless heavy green vaginal discharge which had developed overnight. She had arrived back in Sydney approximately 24 hours earlier by an international air flight following an overseas holiday with her mother and two adolescent siblings. The family had spent 72 hours in transit flying from Rome to Sydney via Moscow.

The child was taken initially to her family doctor and a heavy growth of *Neisseria gonorrhoeae* was isolated. The organism was resistant to both penicillin and ciprofloxacin. One week later, following an initial course of antibiotics, the child was referred to the author for assessment of possible sexual abuse and ongoing management of the *N gonorrhoeae* infection.

Before boarding a flight to Moscow the family had spent 3 days in a hotel, sightseeing and the previous 2 days with relatives. During the 8 days before arriving in Sydney, the mother had unusually close contact with the child, had shared a bedroom with her, and had accompanied her almost continually. The child's behaviour and demeanour had shown no change and both the child and the siblings were asymptomatic. When questioned by her mother, the child strongly denied any history of genital contact.

The flights to and from Moscow were noted to be full with no spare seats. Both the mother and the child stated that there were queues to use the toilets during both flights and that by the end of the flights the ''toilets were very dirty.''

The mother stated that when the child used a public toilet the child always wiped the seat with toilet paper before using it. The child confirmed this. She said her fingers occasionally became dirty while wiping the seat.

Genital examination of the child revealed no significant redness of the introitus or physical abnormality. She had an intact annular hymen; however, the absence of genital injury has no relevance in making a diagnosis that excludes sexual abuse.[1]

As part of the routine investigation, the matter was reported the New South Wales Department of Community Services and all family members were tested for *N gonorrhoeae* and were negative.

It is important that all cases of *N gonorrhoeae* in children be fully investigated for sexual abuse, and reported to the relevant child protection authorities. There is no doubt that almost all gonococcal vaginal infections in prepubertal children are sexually transmitted,[2] and this may include those previously reported as non-sexual.[3] However it is also accepted that cases of non-sexual transmission of *N gonorrhoeae* in children do occur,[4] but proof beyond all doubt can be very difficult to document scientifically.

On the basis of the demeanour of the child, reports of increasing rates of gonorrhoea in the former Soviet Block countries,[5] the incubation period for symptomatic *N gonorrhoea*, the history from the mother and her unusually close supervision of the child, as well as the child's known behaviour in public toilets, it is the belief of the author that the child most probably contracted the infection via autoinoculation while using a mixed toilet in a crowded aeroplane.

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Detection of *Chlamydia trachomatis* by polymerase chain reaction in male patients with non-gonococcal urethritis attending an STD clinic

Genital infection with *Chlamydia trachomatis* (35–50%) is the single most identifiable cause of non-gonococcal urethritis (NGU) in heterosexual men and may have serious consequences, not only for men but for their partners. In India, a high prevalence of genital *C trachomatis* infection has been reported in women.[1] However, there is considerably less information on male chlamydial infection.[2 3] There is a definite need for reliable screening of *C trachomatis* genital infection in men in order to prevent underdiagnosis of genital chlamydial infection and to facilitate better clinical management of this infection in India. This study was undertaken with the aim to find the prevalence of *C trachomatis* infection in male patients with NGU attending the STD clinic of a major city hospital in north India.

After obtaining informed oral consent, 90 male patients (age 18–55 years) clinically suspected to have urethritis and attending the STD clinic at Safdarjang Hospital, New Delhi were enrolled. Of these, 85 NGU patients were included in the study on the basis of microscopic examination of urethral swab specimens for the presence of >10 polymorphonuclear neutrophils/high power field and negative results for *Neisseria gonorrhoeae*. None of the patients showed genital lesions. The patients belonged to various socioeconomic groups and the majority of them admitted to having extramarital heterosexual contact. The specimens were collected using sterile cotton tipped swabs (Hi Media, Mumbai, India) from the urethra of each patient after removing the secretions/discharge. The samples were collected in vials containing phosphate buffered saline for screening by a plasmid specific polymerase chain reaction (PCR) assay (517 bp)[1] and confirmation by culture in McCoy cell line followed by direct fluorescent assay (DFA) (Microtitre, Syva Corporation, Palo Alto, CA, USA) on infected coverslips.[4]

Urethral *C trachomatis* infection was found by PCR (fig 1) and culture in 20 (22.3%) and 21 (24.7%) symptomatic male NGU patients, respectively. Further, chlamydial infection was most common (27.6%; statistically non-significant) in men in the 26–35 years age group. In an earlier hospital based study on male NGU patients reported from India, *C trachomatis* and *Trichomonas vaginalis* were the most common pathogens found by culture in urethral discharge specimens, being responsible for 18% and 19% cases, respectively.[2] Another study from Chennai, India reported the prevalence of *C trachomatis* infection in male and female genital swab specimens as 18.9% and 32.2% by culture and PCR, respectively.[3] *Chlamydia* and *Ureaplasma urealyticum* were the most common infecting and co-infecting pathogens (51.5% by PCR in first void urine and 45.6% by culture in intra-urethral swab specimens, respectively) in male patients with NGU attending an Israeli STD clinic.[5] In a study from Turkey, the prevalence of *C trachomatis* and *N gonorrhoeae* (screened by ligase chain reaction in either

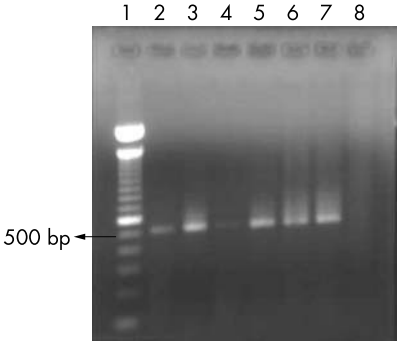

Figure 1 Detection of *Chlamydia trachomatis* by polymerase chain reaction in 1% agarose gel electrophoresis using 517 bp plasmid primer. Lane 1 is DNA marker. Lanes 2–6 show amplification of *C trachomatis*. Lane 8 is a negative control. Lane 7 is a positive control for *C trachomatis*.

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urethral swabs or first void urine) among men with symptomatic urethritis was 15.7% and 9.4%, respectively.[6] This should be viewed with concern particularly in developing countries like India where screening for *C trachomatis* is not done on a routine basis and, hence, extensive screening should be conducted for detection of genital *C trachomatis* infection in men using sensitive and specific molecular assays like PCR.

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BOOK REVIEW

Letting Them Die—Why HIV/AIDs prevention programmes fail

By Catherine Campbell. Pp 214; £40.00 (cloth) £12.95 (paper). Oxford: James Currey, September 2003. ISBN 0-85255-867-8 and 0-85255-868-6.

What is going on with HIV in South Africa? The epidemic escalates with no sign of slowing down, making the country the worst affected in the world. The government continues to try and find excuses not to deliver either treatment or prevention programmes. The sense of stigma is so palpable that ignorance of serostatus carried to the grave seems to be the usual way of living with the virus.

This book tells the story of an HIV intervention project in Carletonville, a mining area near Johannesburg, where mineworkers and female sex workers eke out a day to day existence in which overindulgence in alcohol and unprotected sex appear to be the norm. It tells a salutary tale of a project conceived optimistically that gets dragged down through petty arguments, jealousy, and mistrust but still emerges to provide fresh insights into how to tackle the epidemic.

Working in HIV in South Africa has always been full of challenges and, based on the story told here, those challenges would appear to be increasing. The author (a social scientist and member of the project research team) reports not only the successes, but also, more bravely, the failures of the project. She sets out her stall to tackle HIV through a project focusing at the community level. The plan was to have a project directed by stakeholders who would work together as a group and develop guiding principles that local HIV affected communities could use to support both individuals and promote HIV prevention programmes among female sex workers, miners, and youth. Unfortunately, the mine groups didn't cooperate and other individuals saw themselves as just that, individuals rather than members of a cohesive, homogeneous community. Peer education, a major component of the project, faced many difficulties. With the benefit of hindsight, it seems as though many of the important stakeholders did not perceive adequate ownership of the project and became disillusioned early on leaving most of the day to day running to those employed by the project directly.

The book is well written and clear and is recommended reading for anyone contemplating a large scale HIV prevention project, whether as a planner, implementer, or evaluator. The book explains social science terminology succinctly for those with limited knowledge of the discipline. It also demonstrates and describes very well that what works in one part of Africa will not necessarily work elsewhere, and that initial local assessment at the design stage of a large scale project is paramount.

As HIV continues to spread outside the high risk groups, the need to educate at the community level also increases but the former group should not be forgotten. A combination of both strategies is probably the best approach. The reality is that, although the HIV epidemic in South and southern Africa has come a long way, there is still some distance to go. Hopefully, those involved in HIV project management will pick up the lessons set out in this excellent little book.

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CORRECTION

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The reference list of the paper by V J Johnston, H Britt, Y Pan, and A Mindel, entitled "The management of sexually transmitted infections by Australian general practitioners" (*Sex Transm Infect* 2004;**80**:212–5), was published incorrectly. The correct reference list can be found as a data supplement to the article online at http://www.stijournal.com/cgi/content/full/80/3/212/DC1.

NOTICES

22nd International Papillomavirus Conference and Clinical Workshop

This will be held 29 April to 6 May 2005 in Vancouver, British Columbia, Canada. Topics will include animal papillomaviruses, diagnosis, epidemiology, HPV associated neoplasia in the developing world, immunology, molecular pathogenesis, natural history, screening, transcription, and treatment.

For more information please contact: 22nd IPC Secretariat, C/o Venue West Conference Services Ltd, #645-375 Water Street, Vancouver, BC V6B 5C6, Canada; tel: +1 604 681 5226; fax: +1 604 681 2503; email: congress@venuewest.com; website: www.hpv2005.org.

16th Biennial Meeting of the ISSTDR

The 16th Biennial Meeting of the International Society for Sexually Transmitted Diseases Research (ISSTDR) will be held 10–13 July 2005 in Amsterdam, The Netherlands. The meeting will be organised jointly by Dutch and Belgian STD researchers. For more information please visit www.isstdr.org.

Answers to MCQs on p 320

(1) a
(2) c
(3) b
(4) c
(5) c
(6) d
(7) d
(8) a
(9) d
(10) b

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