

## Behaviour and communication change in reducing HIV: is Uganda unique?

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The clearest example of declines in HIV prevalence and changes in sexual behaviour comes from Uganda. Are there lessons to learn for other countries or is Uganda unique? In this paper, we assess the epidemiological and behavioural data on Uganda comparatively to other African countries and then analyse data from other populations where HIV has declined. In Uganda, HIV prevalence declined from 21% to 9.8% from 1991–1998, there was a reduction in non-regular sexual partners by 65% and greater levels of communication about AIDS and people with AIDS through social networks, unlike the comparison countries. There is evidence of a basic population level response initiated at community level, to avoid risk, reduce risk behaviours and care for people with AIDS. The basic elements — a continuum of communication, behaviour change and care — were integrated at community level. They were also strongly supported by distinctive Ugandan policies from the 1980s. We identify a similar, early behaviour and communication response in other situations where HIV has declined: Thailand, Zambia and the US Gay community. In Thailand, visits to sex workers decreased by 55% and non-regular partners declined from 28% to 15% (1990–1993): as important as the ‘100% condom use policy’. Similarly, in Zambia and Ethiopia risk behaviour has decreased and analysis of Sexually Transmitted Disease (STD) rates among Gay populations in the USA shows a decline from as early as 1985 in White Gay populations, with later declines in Hispanic and Black Gay populations. These responses preceded and exceeded HIV prevention. However, where they were built on by distinctive HIV policies, HIV prevention has been scaled and led to national level declines in HIV. It is not easy to transfer the lessons of these successes. They require real social and political capital in addition to financial capital. Nevertheless, similar characteristics are present in community responses in Africa, Asia and USA, and even in fragmented signs of HIV declines in other African cities. Only in a few situations has this behaviour and communication process been recognised, mobilised and built on by HIV prevention policy. Where this has occurred, HIV prevention success has been greater than biomedical approaches or methods introduced from outside. It represents a social vaccine for HIV from Africa, and is available now.

**Keywords:** AIDS, community, comparative, epidemiology, prevention

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### Introduction

When you go to the villages in south east Uganda first affected by AIDS, they tell you the basic elements of their response: communication, behaviour change and care (Low-Beer & Stoneburner, 2003 in press). It is in these villages that the Ugandan ‘success’ began. The community response always preceded and exceeded interventions delivered to them and, in Uganda, was distinctively built on by national policy. The quality of their response is now receiving considerable prominence, and stands in contrast to many other approaches which arrived in Africa later and from outside.

The recent prominence of an African ‘success’ has led to discussion of whether Uganda provides a basis for wider international HIV prevention (Green, Nantulya, Stoneburner & Stover, 2002; Parkhurst, 2002; Sachs, 2003). The discussion has been highly political; as much concerned with international, European and US policy, as HIV prevention. Despite confusion in interpretation (Asiimwe-Okiror, Musinguzi, Opio, Tembo, Low-Beer & Stoneburner, 1996; Asiimwe-Okiror, Opio, Musinguzi, Madraa, Tembo & Crael, 1997; Wawer, Serwadda, Gray, Sewankambo, Li, Nalugoda, Lutalo & Konde-Lule, 1997; UNAIDS, 1998; Kilian, Gregson,

Ndyanabangi, Walusaga & Kipp, 1999; Low-Beer & Stoneburner, 2001; Economist, 2002; Parkhurst, 2002; Green *et al.*, 2002), the data are perhaps the clearest of any country situation. There has been a decline in national HIV prevalence from 21.1% to 9.8% from 1991–1998, continuing to 6.4% in 2001 among pregnant women attending antenatal clinics (ANC): with supporting declines in rural and urban areas and in population cohorts (Stoneburner & Low-Beer, 2000). The most important factor in this decline is a decrease in non-regular partners by 65% during 1989–1995, and a contraction in sexual networks (decreases in overall sexual activity and increased condom use also occurred). This has been shown in successive analyses of Ugandan epidemiological and behavioural data over time and comparatively to other countries (Stoneburner, Low-Beer, Tembo, Mertens & Asiimwe-Okiror, 1996; Low-Beer, 1997; Stoneburner & Carballo, 1997; Stoneburner & Low-Beer, 2000; Low-Beer & Stoneburner, 2001; Green *et al.*, 2002).

This is evidence of a basic population level response initiated at community level, to avoid risk, reduce risk behaviours and care for people with AIDS. Communication about AIDS through personal networks dominates in Uganda

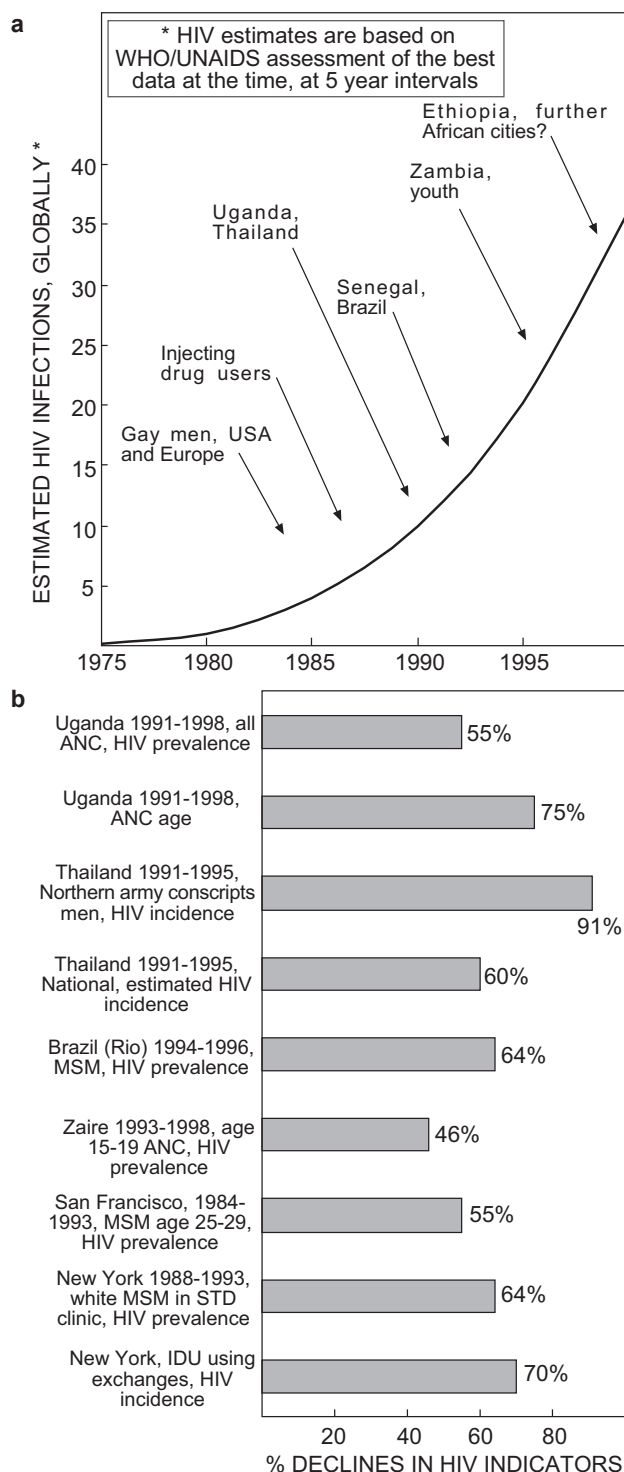
unlike other countries (Low-Beer & Stoneburner, 2002). A second communication characteristic is also prominent and higher than other countries, personal knowledge of people with AIDS (Demographic and Health Survey (DHS) data). The basic elements — communication, behaviour change and care — were strongly promoted in Ugandan policy from the 1980s. They are reflected in how the community responded as well as in changes to distinctive behavioural and epidemiological indicators.

However, an important question is why these results are not seen elsewhere to the same extent even a decade later? Other countries in east and southern Africa which have committed greater resources and have implemented many elements of global policy — condom provision, treatment of STDs, media programmes, testing and counseling (Schwartlander, Stover, Walker, Bollinger, Butierrez, McGreevey, Opuni, Forsythe, Kumaranayake, Watts & Bertozzi, 2001) — have seen HIV prevalence increase throughout the 1990s. Many of these countries have made progress in important areas — South Africa has the highest condom use rate at last sexual act (NMF/HSRC, 2002), Botswana is advanced in terms of treatment — but they have not managed the interruption of HIV infection on the same scale as Uganda. There are recent signs of stabilisation or declines in HIV prevalence from the US Bureau of Census HIV database and of a behaviour and communication response in several areas in Africa, but these remain fragmented and not brought to scale at a national level (Boston Globe, 2003).

In this paper, we review Uganda in the context of other dramatic prevention successes. These have occurred in very different settings: but we argue they have some common behavioural and communication characteristics. This is not to say the success is easily transferred. It requires real political and social capital, in addition to finance and a set of costed interventions (Attaran & Sachs, 2001; Schwartlander *et al.*, 2001; Stover, Walker, Garnett, Salomon, Stanecki, Gys, Grassly, Anderson & Schwartlander, 2002; Global HIV Prevention Working Group, 2002). Uganda is unique in its approach: but we will argue reflects universal building blocks apparent elsewhere, of what makes HIV prevention work.

### Evaluating HIV prevention: local successes and global failures

Given the relentless increase in global infections to 42 million by December 2002 (UNAIDS, 2002) it is often difficult to appreciate the scale of some of the successes (Figure 1a, 1b). There is strong evidence for the magnitude of their impact in interrupting HIV dynamics, when they do work (Low-Beer & Stoneburner, 2001). They have also occurred in a variety of settings, from Africa, Asia, Europe and USA: but have remained localised against the background of increasing global infections. Figure 1a illustrates the increase in estimated HIV infections globally, based on WHO/UNAIDS assessments of the best data at the time, at five year intervals (it is illustrative as estimation methods have changed, but local successes are in contrast to continued spread in southern Africa and Asia). At the same time it shows the timing of some of the population level successes in HIV prevention: which have had only a limited impact on



**Figure 1:** The scale and timing of significant successes in reducing HIV prevalence and incidence. (a) Timing of population level successes in reducing HIV (shown by arrows) against the background of increasing global HIV infections, 1975–2000 (estimated by UNAIDS/WHO at five year intervals based on the best data at the time). (b) Percentage declines in HIV prevalence and incidence in specific populations: from ANC sentinel surveillance (Uganda), army cohort data and modelling (Thailand), HIV surveillance in Gay men (Brazil) and in youth (Zaire) and cohort and HIV surveillance data in men who have sex with men (MSM) and injecting drug users (IDUs) (USA) (see text for sources)

global HIV infections. These include data from: restricted populations in Europe and USA in the 1980s (McKusick, Horstman & Coates, 1985; Stoneburner, Lessner, Fordyce, Bevier & Chiasson, 1993; De Angelis, Gilks & Day, 1998); national level declines in Uganda and Thailand in the early 1990s (Brown, Sittitrai, Vanichseni & Thisyakorn, 1994; Mason, Markowity, Kitsiripornchai, Jugsudee, Sirisopana, Torugsa, Carr, Michael, Nitayaphan & McNeil, 1995; Asiimwe-Okiror *et al.*, 1997); containment of the epidemic in Senegal and Brazil (UNAIDS, 2001; Low-Beer & Stoneburner, 2001; Levi & Vitoria, 2002); more fragmented declines among Zambian youth in the late 1990s (Fylkesnes, Musonda, Sichone, Ndhlovu, Tembo & Monze 2001; Agha, 2002) and from urban areas in 11 African countries in the last years (Boston Globe, 2003). The scale of the declines in indicators of HIV prevalence and incidence in selected populations (from disease surveillance and cohort studies) is shown in Figure 1b. They are in strong contrast to the global trends.

Unfortunately there is even greater evidence of HIV prevention that has not had a similar impact on the epidemic. Many countries in east and southern Africa with greater resources than Uganda, have implemented most of the recommended elements of HIV prevention (condom distribution, sentinel site surveillance, STD treatment, media programmes, VCT) (Global HIV Prevention Working Group, 2002; Schwartlander *et al.*, 2001): yet have seen HIV prevalence increase throughout the 1990s (ANC surveillance data, US Bureau of Census database). There are signs of stabilisation and declines more recently in urban areas in several countries (most notably Ethiopia, Rwanda and Tanzania) from the US Bureau of Census database. These are hopeful but remain fragmented and not on the same population scale as the situations in Figure 1b, in which HIV prevention really seems to have taken hold at the population level.

Is there something we can learn from the successes: common elements in different settings which may be transferable elsewhere? We will argue that community processes, communication about AIDS, care for people with AIDS and population level behaviour changes, have characterised all these successes. They all responded in their own way: Thailand, the US Gay population and Uganda. Rather than following best practice, they created it. Yet when the HIV and behavioural data is analysed in detail there are similar behavioural and communication building blocks in each situation.

This is not to say the elements are easily transferable and we have to be careful of generalisation. The response preceded and exceeded most interventions that were delivered to the population. It cannot be easily packaged. However, these common elements may help to guide some of the political and social as well as financial resources needed to combat HIV.

### Uganda: an African success

Uganda remains the best example of success in population behaviours and communications leading to reductions in HIV prevalence. The data are relatively clear and conclu-

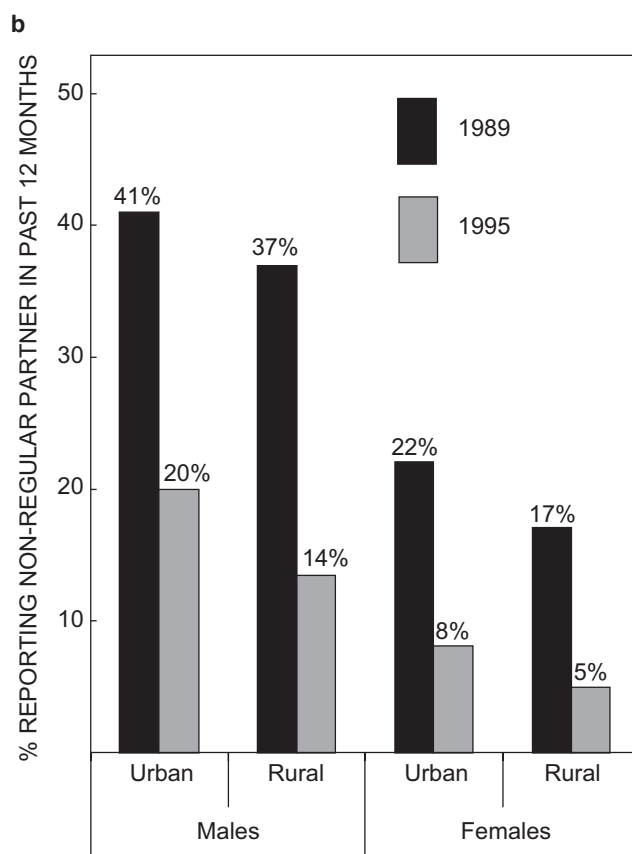
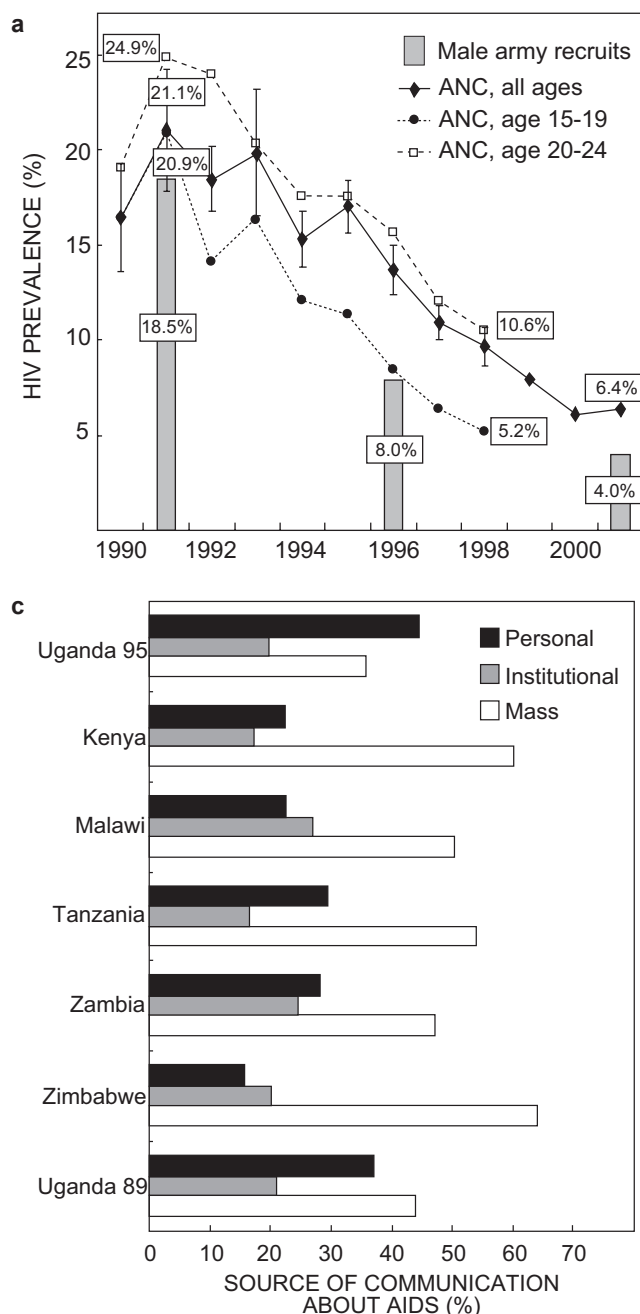
sive. HIV prevalence declined nationally from 21.1% to 9.7% from 1991–1998 across 15 antenatal clinic sites (Figure 2a) with greater declines among younger age groups. These declines are repeated in other national datasets available at country level: army recruits and blood donors, as well as data from all strata of society, urban and rural (Stoneburner, Low-Beer, & Green, in press; Stoneburner & Carballo, 1997; Low-Beer & Stoneburner, 2003 in press).

#### a. HIV prevalence and sexual behaviour declines: when and by how much?

There are questions of bias, particularly in antenatal clinic data (UNAIDS, 1998). However, declines were also seen in male army recruits (aged 21) from 18.5% to 8%, 1991–1996, and to below 4% in 2002 (Figure 2a). Blood donor data from the Ugandan Ministry of Health also show significant declines, even among replacement donors from 24% to 7% (1989–1998) who are least affected by selection bias. There are 50% declines in HIV prevalence in rural districts, for example in Gulu from 27.1% to 12.8% among pregnant women (1993–1998), from 2% to 0.8% among secondary school students (1994–1998), and in rural sentinel sites from 4.2% to 2.3% in Mutolere and 2.8% to 0.9% in Matany (1993–1999) (HIV surveillance data, Ugandan AIDS Control Programme). In a sample of all young women in Kabarole, an area away from the epicentre and the trans-African highway, there were declines in all strata over the period (Kaleeba, Kadowe, Lalinaki & Williams, 2000). There were greater absolute declines in urban areas but comparable relative declines in rural areas: 30% to 10% in urban, 18% to 9% in semi-urban, 10% to 5% in rural, 1991–1996.

There have also been declines in rural population cohorts in Masaka and Rakai (Mulder, Nunn, Kamali & Kengeya-Kayondo, 1995; Wawer *et al.*, 1997; Mbulaiteye, Mahe, Whitworth, Ruberantwari, Nakiyingi, Ojwiya & Kamali, 2002), as well as declines in HIV incidence from 7.6 per 1 000 person years in 1990 to 3.2 per 1 000 person years in 1998 (a decline of 58%) among adults of all ages in the Masaka MRC (Medical Research Council) cohort. The decline was greater among males by 75% (from 9.4/1 000 to 2.4/1 000) than females (6/1 000 to 4/1 000). If the data are grouped from 1990–1994 and 1995–1998 a decline in HIV incidence of 37% is reported (Mbulaiteye *et al.*, 2002). While there is geographical heterogeneity, rural as well as urban sentinel sites show declines by 1998, with the exception of Tororo on the Kenyan border (which appears to behave culturally and epidemiologically more like Kenya than Uganda, yet has subsequently declined since 1998).

There were a wide range of sexual behaviour changes in Uganda: reducing partners, abstinence, faithfulness, marriage, increased condom use, as well as others we probably will never know about (Low-Beer & Stoneburner, 2001). However, when DHS and knowledge, attitudes and behaviours (KABP) data are analysed comparatively to other countries and over time, the major difference in Uganda is a reduction in non-regular sexual partners and an associated contraction of sexual networks (Stoneburner & Carballo, 1997; Stoneburner & Low-Beer, 2000; Low-Beer & Stoneburner, 2003 in press). In comparable population surveys in 1989 and 1995, the numbers reporting non-regular



**Figure 2:** Evidence of HIV prevalence, behaviour and communication changes in Uganda. (a) Declines in HIV prevalence in Uganda among antenatal clinic surveillance sites, in all ages and for 15–19-year-olds and 20–24-year-olds (in sites where age data is available), and among male army recruits. (b) Percentage of men and women reporting non-regular partners in the last 12 months in 1989 and 1995 in Uganda (Uganda Ministry of Health/WHO surveys). (c) Source of AIDS knowledge by most important communication channel in Uganda (1989, 1995), Kenya (1998), Malawi (1996), Tanzania (1996), Zambia (1996) and Zimbabwe (1994). Personal channels (dark bars), institutional (striped bars) and mass channels (white bars). Data from Uganda Ministry of Health (MOH), AIDS Control Programme, DHS surveys (Macro International), and KABP surveys for Uganda in 1989 and 1995 (WHO/Uganda MOH)

partners declined by 65% in Uganda, with declines in urban and rural areas, among men and women, as shown in Figure 2b (KABP survey data, Uganda Ministry of Health/WHO). While there are some issues in comparing surveys over time, the quality of the early survey has been reviewed as high (and UNAIDS confirms the similar range, survey methodology and key questions on sexual behaviour, UNAIDS, 1998). They are carried out in eight and four districts respectively but when stratified correctly comparability is high (Stoneburner & Low-Beer, 2000). Furthermore in a four country comparison of DHS data, levels of non-regular partners were 60% lower in Uganda in 1995, than Kenya in 1998 and Zambia and Malawi in 1996 (Stoneburner & Carballo, 1997; Stoneburner & Low-Beer, 2000). The latter

countries had similar levels of sexual partnerships to Uganda in 1989. Although condom use had increased (ever condom use and at last sexual act), they had not experienced the same behavioural response to AIDS. While there had been a research focus on distant determinants and even more proximate determinants like condom use, the major difference was in primary sexual behaviours.

Again these behavioural changes are supported from several other sources of data for the key period in the late 1980s and early 1990s. Konde-Lule (1993; 1995) in a cohort study reported that those with two or more concurrent partners fell from 43% to 12% among men, and from 13% to 1% among women, from 1987–1992. In a study in three southern districts of Uganda in 1991, the percentage of a random

sample of respondents ( $n = 954$ ) reporting two or more sexual contacts per year was 17% in 1991 compared to 43% during the three years prior to this (Moodie, Katahoire, Kaharuzza, Balikowa, Busuulwa & Barton, 1991, cited in Green, 2003). Fortunately there are several Ugandan behavioural surveys in the late 1980s (often undertaken by Ugandans though funded by WHO/Rockefeller/Ford and of high quality), the AIDS Reproductive Health Network study ( $n = 3\ 160$ ), the Adolescent Fertility Survey ( $n = 4\ 510$  in 6 districts). They consistently point to higher levels of casual sex in the late 1980s and declines by the mid-1990s (Green, 2003). When analysed comparatively even the three population cohorts in Rakai (Uganda), Masaka (Uganda) and Mwanza (Tanzania) show differences in sexual behaviour at baseline in the early 1990s. There are 78% fewer men in the Ugandan studies with 5+ sexual partners (1.4% and 2.1%) than in the Tanzanian study (9.6%) (Low-Beer, 2002). Furthermore the recent results of the Masaka trial showed declines in casual sex from 35% to 15% across all arms of the study (apparent by round 2 in the 1990s and together with the low and declining HIV incidence throughout the 1990s should have been reported earlier given the controversy) (Kamali, Carpenter, Whitworth, Poor, Ruberantwari & Ojwiya, 2003). These secular declines in casual sex outweighed the impact of either STD treatment or packaged behavioural interventions (the community processes well described in the control and combined with the national prevention programme are worth greater attention — they may yet convert it into the right study at the right time). The declines in HIV and casual sex in Uganda were truly scaled to the population level and not restricted by age, strata, region or to groups exposed to a specific intervention

Although there has been considerable confusion at the international level about what happened in Uganda (UNAIDS, 1998; Korenromp, Bakker, De Vlas, Gray, Wawer, Serwadda, Sewankambo, Dik & Habbema, 2002; Global HIV Prevention Working Group, 2002; Green *et al.*, 2002; Parkhurst, 2002), Ugandans were quite clear about how they changed their behaviour. When Ugandans were asked how they had changed their behaviour due to AIDS by 1995 they responded with the following: 48% of men and women reported that they stuck to one partner, 11% of women and 14% of men stopped all sex, and 2.9% of women and 12.5% of men started using condoms (Macro International, 1996). When what Ugandans say is analysed by age — sticking to one partner is the most frequent response in all ages for men and women, except among young men aged 15–19 where stopping all sex is dominant. Among women, sticking to one partner is the most frequent response in all ages. Stopping all sex is actually slightly higher in older women over 45 than in young women aged 15–19. When adults across African countries were asked what is the most important response to AIDS, they state reductions in casual sex and abstinence more highly than condom use (DHS survey data). Yet international responses to safe sex have largely focused on the latter (Green *et al.*, 2002). While condom use had increased in Uganda, it was not comparatively higher than in other countries.

Unlike the Ugandans themselves, foreign researchers have been surprisingly reluctant to highlight the precise

changes in basic sexual behaviour. Unfortunately a UNAIDS re-analysis of the 1989 and 1995 KABP surveys greatly underestimated sexual partner reduction suggesting only a 9% decline and not using standard WHO indicators (which showed the 60% declines noted in Ugandan analyses in 1995–1996 and in their final report on the survey in 1995) (Asiimwe-Okiror *et al.*, 1996; 1997; UNAIDS, 1998; 1999; Stoneburner, Low-Beer & Green, in press). When the Ugandan success was challenged in 2002, the Ugandans showed that HIV prevalence had declined nationally to under 5%, the Director General of Health adding ‘they don’t believe that any country in Africa can do anything positive’ (New Vision, 2002).

#### **b. Social communications about AIDS**

What else may distinguish Uganda during this period in the early 1990s? We believe there is evidence of an additional social and risk communication process which greatly enhanced HIV prevention. Ugandans seemed to communicate about AIDS and people with AIDS differently (Figure 2c). Basic knowledge indicators such as ever having heard of AIDS, were similar to other countries (DHS survey data). However, in Uganda personal channels predominated in communicating about AIDS in both urban and rural areas, among men and women. In Uganda, 82% of women heard of AIDS from this source compared to 40–65% in other countries. Personal networks are also dominant, stratified by urban (74%) and rural areas (84%) and among men (70%) (DHS data 1995, Macro International, 1996; Low-Beer & Stoneburner, 2002). Communication through social networks is lower in Zambia and Tanzania (60–65%), and much lower in Zimbabwe and southern Africa (<45%) (analysis of DHS data; Low-Beer & Stoneburner, 2002). When the relative importance of communication channels is assessed, in Kenya mass channels still dominate, as they do in Malawi, Tanzania, Zambia and Zimbabwe (and even in Uganda in 1989). In addition, in Uganda there was a unique shift between 1989 and 1995 from impersonal (media) to personal channels for communicating about AIDS unlike other countries, shown in Figure 2c (KABP and DHS data, Macro International and Uganda AIDS Control Programme/WHO). There are some limitations to the data and analysis on social communications and better indicators are required to pursue this hypothesis.

A second distinctive component in Uganda was knowledge through social networks of someone with or who had died of AIDS (Low-Beer, Stoneburner & Mukulu, 1997): 91.5% of men and 86.4% of women knew someone with AIDS through social networks in Uganda by 1995 (Macro International, 1996). In Zambia, Kenya and Malawi the proportion was lower but significant, 68–71%. In Zimbabwe and South Africa it was below 50%. This is important as it shows that AIDS issues in Uganda were rooted in discussions in social networks rather than just received from public health and media messages, to which there is widespread scepticism. Communications are often reduced to the provision of messages, media and public health campaigns. More fundamentally, how Ugandans communicated about AIDS and people with AIDS reflected and influenced their behavioural response.

The horizontal behavioural and communication process was widely mobilised by faith based organisations, prominent cultural figures (for example the musician Philip Lutaaya who died in 1989), political, military and community figures, non-governmental organisations (NGOs) and care organisations like TASO (The AIDS Support Organisation). It cannot be described as simply spontaneous: it required significant social and political capital in addition to financial resources. There were also distinctive vertical policies in Uganda which helped scale this horizontal community response: (1) a clear, direct communication programme focused on three clear topics: AIDS, reducing sexual partners or 'zero grazing' and not pointing fingers but caring for people with AIDS; (2) AIDS case surveillance which gave a definitive diagnosis and form to the AIDS epidemic at local level and allowed all involved, health personnel, families and communities to talk and deal with AIDS directly; (3) legitimisation and strong primary support of care networks with a broad approach involving NGOs like TASO and faith based organisations (which talked about AIDS at community events including funerals). This focus on communication, behaviour change and care is only the basis of HIV prevention. It needs to be added to with condom provision, HIV and STD treatment and, when feasible, the development of vaccines. However, despite more sophisticated approaches elsewhere, the basic communication and behavioural process we have identified in Uganda may be necessary for HIV prevention to be successfully scaled to the population level. As a Ugandan priest with HIV commented:

'So many people accept that AIDS is 'out there', but they don't go beyond that and do anything about changing their behavior. You see to be really open about AIDS, you have to acknowledge that it could affect you personally' (Kaleeba *et al.*, 2000).

### **Behavioural and communication elements of other successes**

Are there similar behavioural and communication processes in other settings, where we have seen successes in HIV prevention? It is dangerous to make analogies between contexts but still important, particularly as Uganda has frequently been seen as unique. In this section, we review evidence of other prevention successes from Africa, Asia, South America and USA, and suggest some similar communication and behavioural elements.

#### ***Thailand: behaviour modification alongside condom use with sex workers***

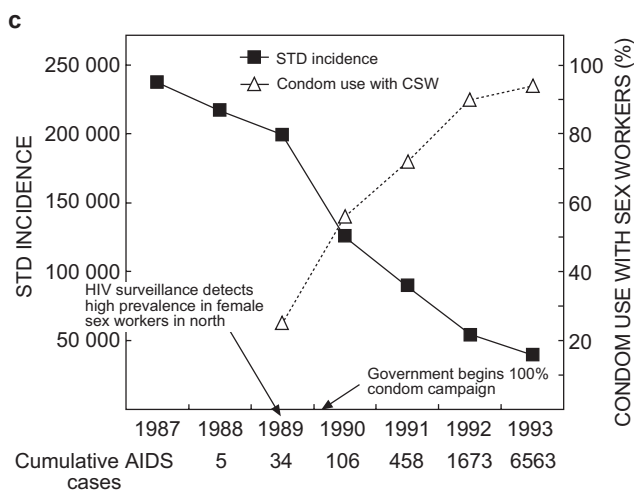
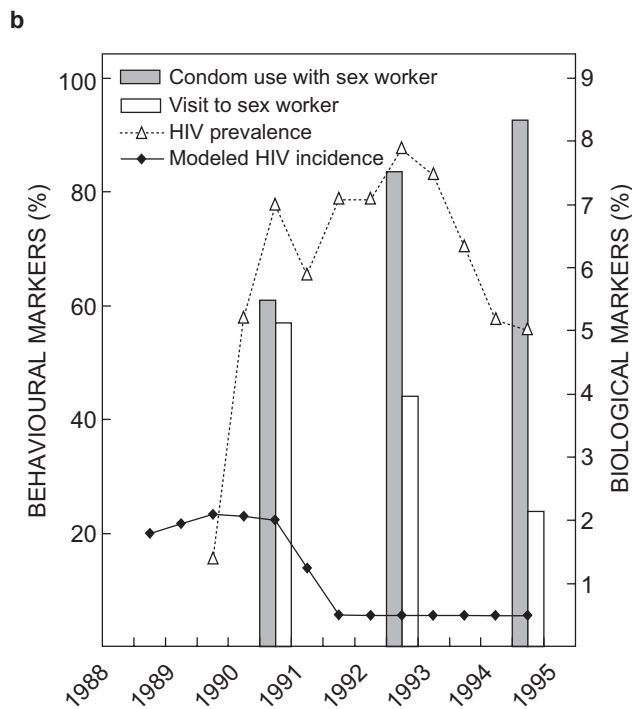
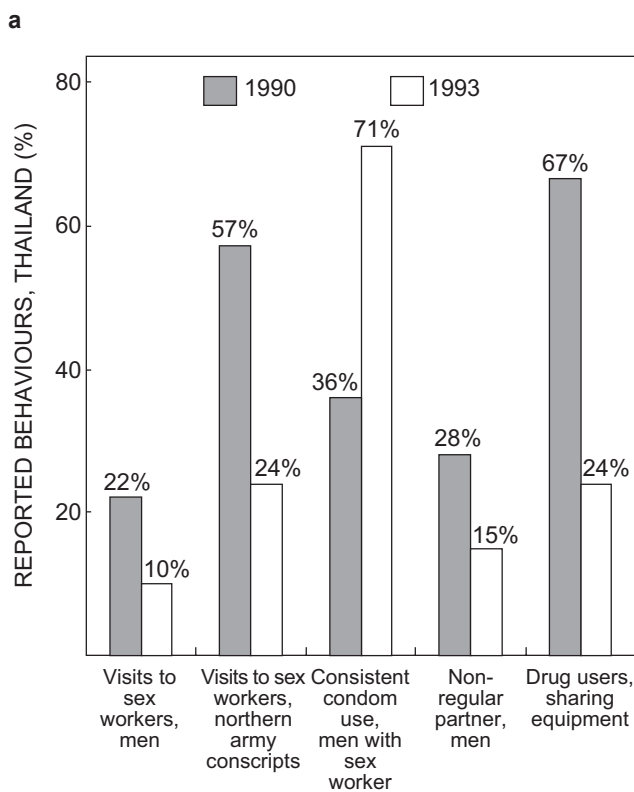
The evidence of declines at the national level from Africa (Uganda) and Asia (Thailand) came out at roughly the same time in the early 1990s (Stoneburner & Low-Beer, 1993; Brown *et al.*, 1994; Asimwe-Okiror, Musinguzi, Opio, Tembo & Biryahwaho, 1995; Mason *et al.*, 1995; Stoneburner, Low-Beer, Tembo, Mertens & Asimwe-Okiror, 1995; Nelson, Celentano & Eiumtrakol, 1996). In contrast to the confusion over the Ugandan data for almost a decade, the Thailand success was accepted almost immediately and correlated with increasing condom use (Figure 3c) (Valdiserri, Ogden & McCray, 2003). Thailand is often regarded as the success

of a 100% condom policy among sex workers (Rojanapithayakorn & Hanenberg, 1996; Global HIV Prevention Working Group, 2002). However it is also important to assess what else happened in line with trends in biological markers, HIV/AIDS and STDs (Figures 3a, 3b, 3c).

HIV prevalence in Thailand increased rapidly in the late 1980s in surveillance data in quick succession among drug users, sex workers, army recruits, and pregnant women (showing the practical problems of targeting HIV prevention first to risk groups suggested by STD prevention) (Brown *et al.*, 1994; Mason *et al.*, 1995; Rojanapithayakorn & Hanenberg, 1996). Early HIV, AIDS and behavioural surveillance was central to the response, providing information politically and publicly. In particular the 1990 national behaviour survey, showed 22% of men visited sex workers and 28% had non-regular partners, resulting in extensive public, media (and probably domestic) debate. AIDS and risk behaviours were on the public agenda, at a personal and political level.

When the data are analysed in Thailand in detail (HIV surveillance data, army cohort data, and repeated behavioural surveys): from 1990–1993 there was a wide range of reported behaviour changes far exceeding the policy interventions to which the success is attributed, Figure 3a (Low-Beer & Stoneburner, 2001; UNAIDS, 2001; Nelson *et al.*, 1996; Rojanapithayakorn & Hanenberg, 1996; Sittitrai, Phanaphak, Barry & Brown, 1994). Again a basic behavioural process of risk avoidance is apparent. Visits to sex workers by men decreased by 55% and non-regular partners decreased from 28% to 15% in repeated national surveys from 1990–1993: at least as important as a reported increase in consistent condom use with sex workers from 36% to 71% over the same period (Figure 3a) (Nelson *et al.*, 1996). Even in Thailand, there was an important communication and behavioural catalyst to prevention, not dissimilar to Uganda. The result was significant changes to the epidemic, 90% declines in HIV incidence among northern army conscripts, 1991–1995 (from 3.2 to 0.3 per 100 person years) and an estimated 60% decline nationally (NESDB, 1994; Beyrer, Brookmeyer & Natpratan, 1996; Khamboonruang, Beyer & Natpratan, 1996).

When we evaluate the time trend in HIV and behavioural data, we see this wider process occurring alongside the important increase in condoms (Figure 3b). Visits to sex workers decline and condom use increases, in line with the estimated timing of the HIV incidence and HIV prevalence declines. Data on STD trends suggest a similar pattern (Figure 4b) (data refers to total reported male STDs at government clinics, Thai Ministry of Public Health). The much publicised association of condom use with STD declines (Rojanapithayakorn & Hanenberg, 1996; UNAIDS, 2001; Valdiserri *et al.*, 2003) shows STDs declining first and at quite moderate levels of condom use. Even in Thailand with a 100% condom policy among sex workers, the last group to show declines in HIV were sex workers. This suggests they were not even primarily protected by this policy of condom use (even at high levels) and the reductions in casual sex and visits to sex workers were most important in protecting men.



**Figure 3:** Changes in reported HIV risk behaviours and biological markers of HIV and sexual risk in Thailand. (a) Behavioural changes from analysis of repeated surveys, 1990–1993 (among all men, northern army conscripts and drug users). (b) Time trend analysis of biological and behavioural indicators — visits to sex workers, condom use with commercial sex workers (CSW), declining HIV prevalence and modelled HIV incidence (data from northern Thai army cohort). (c) Trends in reported STDs and condom use with sex workers among Thai males, 1987–1993: showing onset of condom campaign, and of HIV/AIDS surveillance (STD data refers to all reported STDs at government clinics, Thai Ministry of Public Health, VD Division)

**USA: prevention success in White but lower in Black and Hispanic Gay men**

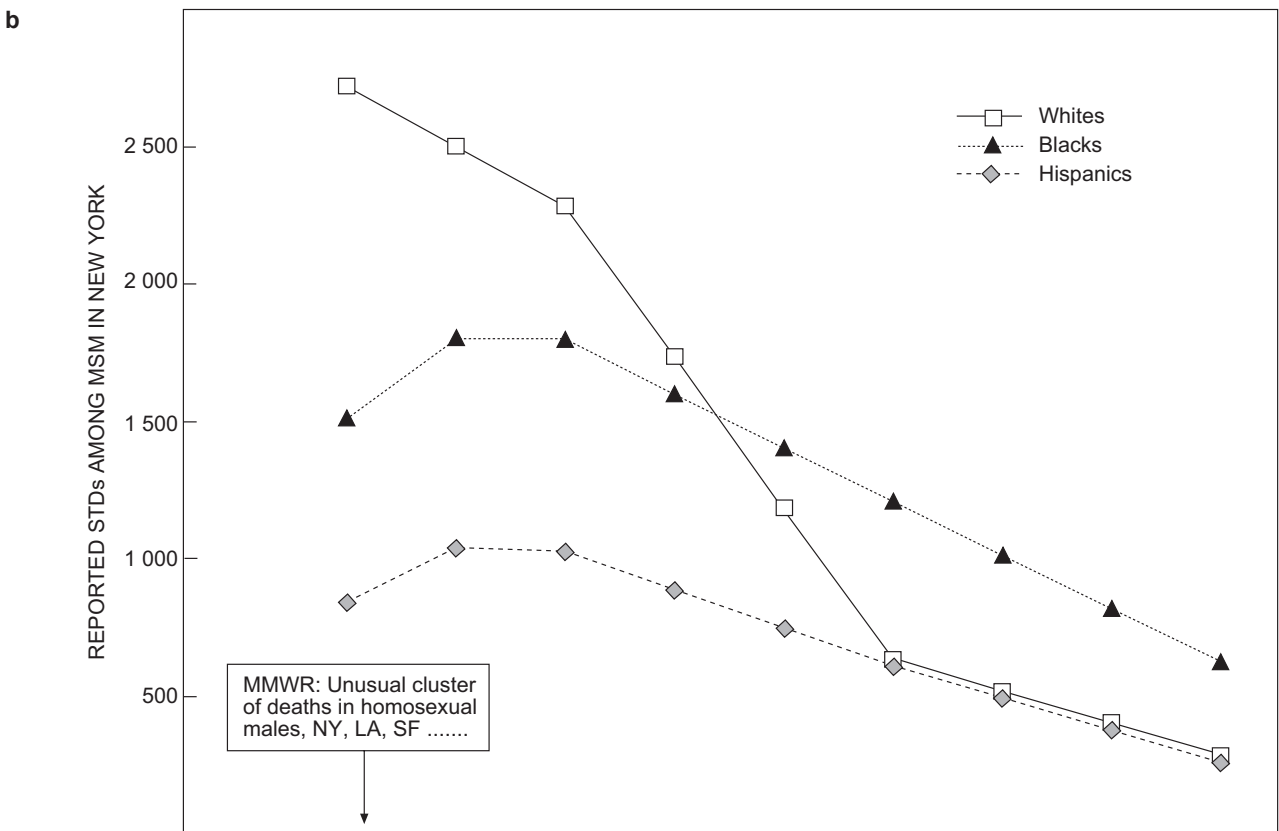
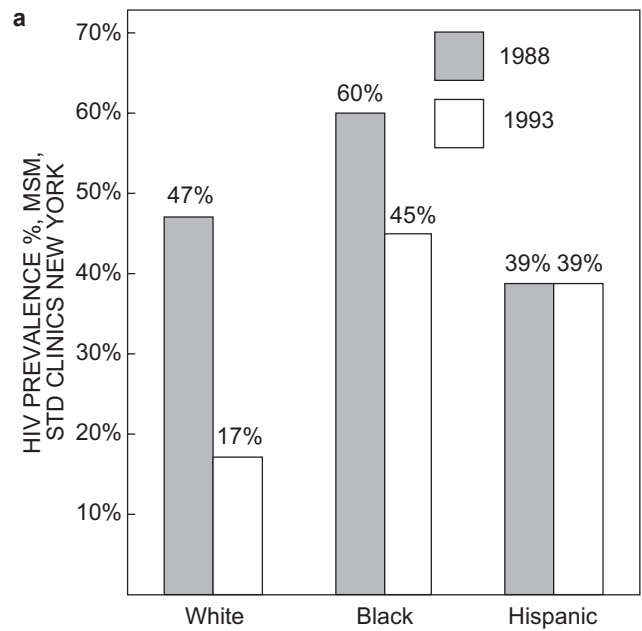
It is certainly stretching the comparative approach to compare the successes in Thailand and Uganda to those in the Gay community in the United States. But again there are similar behavioural and communication elements present, all resulting in the most substantial declines in HIV prevalence and incidence scaled to the population level seen internationally.

First, the Gay community in the United States is marked by a very strong community level response to AIDS: extensive care networks (as developed as TASO in Uganda) and a behavioural response reported as early as 1985

(McKusick *et al.*, 1985; Winkelstein, Samuel, Padian, Wiley, Lang, Anderson & Levy, 1987). Similar to Uganda, they have high levels of social capital and communication in addition to formal HIV interventions. Again, a social communication process preceded these behavioural changes, particularly among the White Gay community (where social cohesion may be stronger than among Hispanic and Black Gay populations). AIDS and people with AIDS were on the agenda of White men who have sex with men (MSM) very early on. However, this did not extend to the same extent to Black and Hispanic Gays, and we see both a lag in declines in biological markers in these groups (Figure 4b) and smaller overall HIV prevalence declines (Figure 4a) (Martin, 1987; Van

Griensven *et al.*, 1989; Fordyce, 1995; Torian, Weisfuse & Makki, 1996).

A retrospective analysis of reported rectal gonorrhoea (RGC) data (Fordyce, 1995; Torian *et al.*, 1996; unpublished data New York City Department of Health) among MSM in New York shows declines in incidence from 1981 among Whites, followed later and to a lesser degree in Blacks and Hispanics (shown in Figure 4b). The initial reports in US cities of early cases of AIDS are coincident with these declines in behavioural indicators, at a time when only 40 cumulative deaths were reported, the majority in Whites. Four hundred AIDS cases were reported by 1983, and it appears information on local risks spreads very quickly through personal networks. In these early stages of the epidemic, the public health approach involved little more than surveillance and AIDS case reporting, evaluation of risk indicators and direct communication with Gay community groups (the Gay Mens Health Crisis had a sub-contract with the New York Public Health Department for \$186 000 — this



AIDS cases	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
White	8	25	89	293	679	1 285	2 170	3 047	4 046	5 352
Black	1	9	38	103	209	408	709	1 032	1 461	1 953
Hispanic	1	6	24	71	166	324	544	818	1 145	1 548

**Figure 4:** Changes in behaviours, HIV prevalence and reported STDs among White, Black and Hispanic Gay males in New York City. (a) Changes in HIV prevalence among men who had sex with men (MSM) in New York City (data sampled at New York City Department of Health (NYC-DOH) STD clinics). (b) Declines in reported rectal gonorrhoea in New York clinics (NYC-DOH) in White, Black and HispanicGay MSM, 1981–1989. Also showing timing of early identification of AIDS cases (reported in Morbidity and Mortality Weekly Report, MMWR from New York (NY), Los Angeles (LA) and San Francisco (SA)) and reported AIDS cases by year (data from Fordyce (1995), Torian *et al.* (1996) and New York Public Health Department)



**Table 1:** Summary of evidence**UGANDA**

- HIV prevalence declines (1991–1998), 21.1% to 9.7% in all ANC and to 6.4% by 2001 (greater declines in youth)
  - Supported by trends in male army cohorts, some population studies
- Wide range of sexual behaviour changes, 1989–1995, focused on 65% reduction in sexual partners and networks
  - Increased condom use (though not to high comparative levels)
- Social communication process: AIDS and people with AIDS on the agenda of personal networks of friends and family
- Early population based AIDS reporting in all areas, later HIV testing

**THAILAND**

- Estimated 90% decline in HIV incidence in Northern army conscripts (1991–1995), 60% nationally and lower declines in ANC and sex workers
- Success of general population as well as targeted prevention activities
  - Visits to sex workers decline nationally, 22% to 10%, 1990–1993
  - Direct sex workers report 90% condom use
- Population based surveillance
  - 1989 national sexual survey widely publicised and debated
  - Rapid political response to HIV trends

**UNITED STATES**

- Declines in HIV among Gay men and sexual behaviour changes apparent since mid-1980s
  - Lower declines in Black and Hispanic Gay men
- Widespread social communication process:
  - AIDS is on the agenda and people with AIDS accepted in White MSM, care networks developed
  - Early population based reporting, 500 AIDS cases by 1984 in San Francisco and later treatments
- Declines in mother to child transmission in 1990s, some signs of increasing risk behaviours among young Gay men, successful treatment and declining mortality

**ZAMBIA**

- Significant declines in HIV prevalence in 15–19 year old ANC particularly in urban Lusaka
- Evidence of behaviour changes, 1996–1999, significant declines in casual sex and increased condom use
- Sustained declines recently, but HIV and behaviour changes (when stratified by age and urban/rural) not generalised to the same extent as Uganda

**SENEGAL**

- HIV prevalence among pregnant women remains below 2%, despite higher levels in neighboring countries
- Low general risk behaviours, 68% of women report no sex before marriage, only 10% of men, in urban Dakar
- Successful prevention activities among sex workers, 97% condom use with last client

**BRAZIL**

- HIV prevalence among pregnant women remains below 3%, but not lower than neighbouring countries
- Substantial declines in HIV prevalence among men who have sex with men largely before ARV treatment introduced
  - 65% Rio de Janeiro, 1994–1996
- Integrated public health approach including free anti-retrovirals since 1996, with a net health cost benefit

**OTHER**

- Stable or declining HIV prevalence in some urban areas in 11 African countries.
- Reduction in casual sex in Ethiopian study, and cohort studies in southern Uganda. Decline in HIV in Kagera, Tanzania on Ugandan border

provided health prevention information, with credibility and links to the community that was inaccessible to government agencies). Again a social and communication process early on in the epidemic linked to local information and community sources, appears an important and not fully recognised part of HIV prevention. Are there similarities between the extensive communication and behavioural process which forms part of public health prevention in Uganda, Thailand and White Gay men, but which has not extended to other groups to the same extent?

**Other examples: Senegal, Zambia, and Brazil**

There are other countries where there is evidence of HIV prevention success, if of a lesser scale: in Zambia, Senegal and Brazil, as well as recent more piecemeal behavioural changes elsewhere. Some of these do show similar behavioural responses: others like Senegal and Brazil are less comparable.

Senegal has maintained low, stable HIV prevalence below 2% in ANC surveillance data throughout the 1990s, benefiting from an early, integrated response to HIV/AIDS (Meda, Ndoye & M'Boup, 1999; UNAIDS, 2001). Again, AIDS reports occurred very early in 1986, and there was a wide political, religious and public debate. This facilitated prevention spanning public health and religious divides,

together with a focus on sex workers (97% report condom use with most recent client, and 60% with non-client partners, KABP data). It is important to place the replication of this prevention strategy in the context of general population culture and behaviours. Senegal is 93% Muslim, and reported sexual behaviours in urban Dakar show 68% of women report no sex before marriage, compared to only 10% of men (Crauel, Cleland, Deheneffe, Ferry & Ingham, 1995; Meda *et al.*, 1999). Levels of multiple sexual relations reported by men (2 or more casual partners in the last year) were 3–4 times higher in other west African countries with higher HIV prevalence and different religious profiles (Cote d'Ivoire and Guinea Bissau) than urban Dakar (KABP survey data, Crauel *et al.*, 1995).

There have been signs of behaviour change in Zambia, which like Uganda has had a prevention focus on reducing sexual partners (Agha, 2002; Green, 2003), with HIV prevalence declining substantially among young pregnant women in urban areas (Fylkesnes *et al.*, 2001). The changes need to be generalised, although recent behavioural changes concentrated in youth in two population based HIV surveys (1996–1999) are hopeful, and include declines in multiple partners and increased condom use (Fylkesnes *et al.*, 2001; Agha, 2002). The percentage of sexually active urban men aged 15–19 who reported two or more sexual partners

declined from 52% to 38% and those reporting sexual activity in the last month declined from 47% to 23%, 1996–1999. Behavioural changes (when stratified by age and urban/rural areas) have not however been generalised to the same extent as Uganda (Fylkesnes *et al.*, 2001; Stoneburner, Low-Beer & Green, in press).

Brazil has a well established epidemic among risk populations, MSM, and intravenous drug users (Low-Beer & Stoneburner, 2001; Levi & Vitoria, 2002). HIV prevalence among pregnant women has remained relatively low, 0.5–2.5% at the regional level among pregnant women (ANC data, Brazilian Ministry of Health; Levi & Vitoria, 2002). However, some increases were reported in the later 1990s, from 0.3% to 2.7% among pregnant women in Rio de Janeiro, 1995–1997 and HIV prevalence remains low but not lower than neighbouring countries. There were also substantial declines in HIV prevalence among men who have sex with men, by 66% in Rio de Janeiro, 1994–1996. Brazil has had an integrated public health approach including free anti-retrovirals since 1996, prevention and treatment. This has no doubt been important probably in conjunction with a behavioural process, as HIV prevalence among Gay men largely declined in advance of the wide-spread availability of anti-retrovirals (AIDS surveillance data, Brazilian Ministry of Health; Levi & Vitoria, 2002).

There is more restricted evidence of stabilisation or declines in HIV prevalence in cities in 11 African countries from the US Bureau of Census Data, though not generalised to the national level (Boston Globe, 2003). Declines were noted in urban areas in Ethiopia, Rwanda, Tanzania and Uganda and separately among young South Africans (NMF/HSRC, 2002; ANC HIV surveillance data, South African Ministry of Health). Furthermore behaviour changes were reported in male factory workers in Ethiopia, including a decline in recent casual sex from 17.5% to 3.5% and in sex with commercial sex workers from 11.2% to 0.75%, 1997–1999 (KABP data, Mekonnen, Sanders, Aklilu, Tsegaye, Rinke de-Wit, Schaap, Wolday, Geskus, Coutinho & Fontanet, 2003).

There are therefore elements of behavioural and communication change in increasing numbers of countries beyond Uganda, and these are summarised in Table 1. Recent evidence suggests that behavioural change associated with stable or declining HIV prevalence, may be occurring in many other contexts, although it has not taken hold at the national level to the same extent as in Uganda. We can identify some common elements to HIV prevention success in surprisingly different situations, although Uganda remains the clearest and most conclusive example.

### **Conclusion: is Uganda unique?**

There are general foundations to HIV prevention in the communication and behavioural process we have identified in Uganda, but which are present to differing degrees in other situations. If they are not mobilised, efforts to curb HIV infection are very difficult and the return on purely financial investment can be less than expected. However, we have to be careful of programmes which claim to deliver similar behaviour changes when their evidence base is poor. They

often rely on externally led, media rather than community based approaches — which cannot replace and often disrupt community responses. One of the major dangers in this epidemic is pretending externally to respond individually, collectively, nationally and internationally, when we have not really internalised the response within communities and in terms of behaviour.

There was a distinctive policy framework in Uganda, which is reflected in the behavioural and biological indicator changes: (1) a simple and direct communication programme focused on three clear messages — AIDS is here and a threat; casual sex is dangerous promoted with messages of ‘zero grazing’ and ‘loving faithfully’; and don’t point fingers, care for people with AIDS; (2) AIDS case notification and local diagnosis which gave a definitive form to the AIDS epidemic at local level related to care and allowed all involved health personnel, families and communities to talk and deal with AIDS directly; (3) legitimisation and strong primary support of care networks with a broad based approach to AIDS involving NGOs like TASO and faith based organisations (which crucially mentioned AIDS at meetings and community events including funerals). It is very difficult to deal with a public health emergency unless the underlying risk behaviour is clearly identified and appropriate warnings given (people may respond to these by abstinence, reducing partners or condom use but all should be legitimate), the disease is made notifiable and dealt with directly by all involved (while remaining confidential but mentioned on records, death certificates and discussed with the patient), and primary care and support by families and communities are legitimised. These vertical policies built on and scaled a wide, horizontal, community based response — engaging rather than disrupting its values and structures and avoiding deep divisions over condom use which were seen as useful but not the solution (or as Museveni stated ‘not the magic bullet’) to AIDS. A role was created for many social institutions, for example of three chairpersons of the Uganda AIDS Commission, one was an Anglican and another a Catholic Bishop. The basic focus on communication, behaviour change and care integrated by communities is reflected in the distinctive behaviour, communication and epidemiological indicators in Uganda. Recent efforts have added to this: widespread condom provision, STD and plans for HIV anti-retroviral treatment. However, if the basic elements are not present, despite increasing resources, HIV prevention underperforms as it is scaled.

The communication and behavioural response is not complete and comprehensive, but it is shared by all the major successes in HIV prevention. It needs to be added to — with condom distribution, treatment and the latest medical technology — but these cannot replace the need to respond fundamentally in terms of behaviour. The approach requires considerable social and political capital in addition to financial capital (Low-Beer & Stoneburner, 2001). It has been argued that we have the former — i.e. we know what works — but are lacking the financial resources (Schwartlander *et al.*, 2001). However, the challenge is to ensure we now get the correct mix, that financial and medical resources flow alongside widespread social and behavioural mobilisation, essential for the uptake of these resources but also for inter-

ruption of the basic epidemiological dynamics of HIV. Each of the examples: the Gay community in the USA, Thailand and Uganda, had a unique way of responding to HIV, but they all responded in a widespread and coordinated fashion. None of them followed a set of international, approved and costed HIV prevention elements (Schwartlander *et al.*, 2001; Global HIV Prevention Working Group, 2002; Stover *et al.*, 2002). Rather, they were able to translate HIV prevention into their own country contexts: they each set rather than followed international best practice. This translation and internalisation of the problem was in many ways the population response, mobilising social and political capital, from government down to communities. That this process precedes and extends far beyond formal HIV prevention is shown by recent evidence of behaviour changes, and some declines in HIV prevalence across several African countries. The seeds of HIV prevention success are present in community responses in many countries. But only in a few situations have these horizontal responses been recognised, mobilised and scaled with HIV prevention policy to result in substantial, national level HIV declines.

As we develop more sophisticated and resourced responses to HIV, we must not lose the basics of these community responses. Was Uganda unique? Yes, one of its qualities was that it found its own response. But it shares a similar communication and behavioural process with other successes as diverse as Thailand, Zambia and the Gay community in USA. This communication and behavioural process often precedes and extends far beyond formal HIV interventions. However, it is rarely built on and brought to scale at the national level. Is it a simplistic basis for international policy? Yes, but the simple building blocks of HIV prevention: communication — behaviour changes and care — have to be in place, or the experience of the 1990s is that we see infection rates soar even in countries that have largely followed international best practice with greater resources for AIDS than Uganda (like many countries in southern and east Africa). The crucial Uganda program, 1987–1992, had a total budget of US\$21 676 000 for five years (under 1 billion US\$ if applied to Africa). Resources were not the limiting factor in Uganda, and President Museveni mocked ministers who suffered from 'AIDISM' or reliance on foreign aid to combat AIDS. Uganda shows the possibility of an African success within the capability of African countries and using their unique resources, with or without global funds however welcome they were in Uganda.

Is there a basis for global HIV prevention policy? There are common elements which characterised all the successes against HIV, which have been transferable in widely different situations. They have touched on universal elements to the response based on an African success. At the same time, they involved a local and individual process of political and social mobilisation, contact and care, communication and risk avoidance. Treatment and other interventions need to be added to this basic response. Treatment may also boost prevention (though there is conflicting evidence) but prevention has certainly transformed the cost-effectiveness and logistics of treatment in Uganda, where you have to treat 5% rather than 15% of your population. The best example of scaling HIV prevention to the population level

comes from Africa, but each country needs to translate its own response, not follow a blueprint. There is evidence of this wider response from many populations in Africa and as Uganda shows, if built on it can fundamentally impact the epidemic, now.

We hope that the *African Journal of AIDS Research*, will promote such an African response and discussion, which by reflecting on an African success, will bring policy closer to the experiences of the continent. We have provided international comparisons to suggest that Uganda represents much more than an African success. It shows how HIV prevention can be scaled to the population level. The early 1990s was a period of optimism in HIV prevention (Low-Beer & Stoneburner, 2003 in press). We had national successes in two continents in Uganda and Thailand, though with fewer resources and technologies. Now there is a period of similar optimism, but we need to learn better the lessons of an African success, which have quite general relevance. There is an African basis for HIV prevention with strong supporting evidence from other varied contexts. While we debate its characteristics and relevance, we must also not forget that if it can be translated to other situations it provides a 'social vaccine' (Stoneburner & Low-Beer, 2000; Low-Beer & Stoneburner, 2001) more powerful than any of the programmes or bio-medical approaches proposed from outside.

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