

INTERROGATING A STATISTIC: THE HIV PREVALENCE RATE IN PNG¹

Dr. Elizabeth Reid AO FASSA

Statistical Leadership Seminar
Australian Bureau of Statistics
Canberra 18 March 2008

Introduction

This presentation interrogates the recent estimate of HIV prevalence in PNG. The 2007 Estimation Report on the HIV Epidemic in PNG effectively halved the HIV prevalence rate for 2005 from 2.00 per cent to 1.02 per cent of the adult population aged 15 to 49. The revised estimate for 2006 is 1.28 per cent and for 2007 1.61 per cent².

These figures seem counter-intuitive in a context where other HIV prevalence estimates have ranged from 2 to 3 per cent up to 5 or 10 per cent and where Australian Government and other papers have talked of the HIV epidemic in PNG as an emergency and a crisis³.

HIV prevalence rates in PNG

The first thing to note about the figures for HIV prevalence in PNG is the implicit claim for accuracy in the citation of the two decimal places and in the specification of the estimated number of people infected.

The rates for 2005 to 2007 are 1.02, 1.28 and 1.61 per cent of adults aged 15 to 49 respectively. The number of people estimated to be living with HIV in 2006 is 46,275.

However, HIV data collection and analysis systems in PNG are seriously flawed, even though the Report states that improved data and better methodologies were used for the 2007 estimates⁴.

Data reporting forms are inadequately filled in. For 2006, age was not noted on one-third of the reporting forms⁵, gender reporting was similarly

¹ An earlier version of this paper, entitled "Modernity, Tradition and Development in PNG: The HIV Epidemic", was given to the Australian Public Service Senior Executive Service Breakfast Series, Canberra, 7 December 2007

² The 2007 Estimation Report on the HIV Epidemic in PNG, Government of PNG, August 2007, p.25.

³ See for example, "The HIV/AIDS Crisis in Papua New Guinea", Miranda Darling Tobias, The Centre for Independent Studies Issue Analysis No. 81, 8 February 2007.

⁴ Ibid, p.27

⁵ Ibid, p.iv

inadequate, and the mode of HIV transmission was not recorded on two-thirds of the forms⁶.

The routine, sentinel and behavioural HIV surveillance systems have major problems of coverage and data accuracy⁷. To take only one example, the claim that “starting in 2007, the prevalence among the rural population will become higher than the urban population”⁸ could well be a statistical artefact.

Before 2005, there were only a small handful of rural sentinel surveillance sites and even for 2005 and 2006 there were only 9, compared with up to 19 urban sites. Yet, eighty five per cent of the population lives in rural areas.

We have no grounds here for determining whether, as from 2007, the prevalence in rural areas is becoming higher than that in urban areas, or whether the change in the balance of urban/rural prevalence is a result of changes in the surveillance coverage.

Further, HIV data is collected in a setting where data systems for making sense of them are themselves inadequate. For example, civil registration data is not systematically collected. Only a small proportion of the births in the population are registered, although this is now increasing where birth registration has been made a condition for school enrolment. The figure is lower for deaths and marriages. Thus civil registration data on the number of deaths or the cause of deaths is not available. Patterns of illness and death - who is dying and from what - are not recorded and so cannot be used to make sense of HIV surveillance data.

There is no national research data specific to HIV prevalence and incidence and the few local studies that have been carried out have methodological limitations.

According to the 2007 Estimation Report, an international assessment made by UNAIDS, using criteria of frequency and timeliness, consistency, appropriateness, and coverage, classifies the PNG surveillance system as poor and non-functioning⁹.

Hence, given the acknowledged and serious limitations of the data collection systems, it would have been more honest to round off these figures.

Numbers and percentages

HIV figures are often given in absolute numbers, the numbers of people recorded as being infected or estimated to be so.

⁶ Ibid, p.9

⁷ Ibid, Section II, pp.6-16

⁸ Ibid, p.iv

⁹ Ibid, p.24

Thus, the PNG Report states that 18,484 people were recorded as HIV infected by the end of 2006 and 46,275 people were estimated to be living with HIV for the same period.

However, the HIV epidemic cannot be understood in absolute numbers, in PNG or elsewhere. Until recent revisions of the HIV prevalence rate in India, it was thought that South Africa and India had roughly the same number of people HIV infected. In India, this number constituted about 1 per cent of the adult population; in South Africa it is about 20 per cent or more of the adult population. Absolute numbers of HIV infected only make sense if the bottom denominator is known.

Further, in situations where there are serious concerns about the quality of the data, it might be better to give rounded national ranges rather than point measures, rounded or otherwise.

However, it is prevalence figures, that is, the percentage of the adult population infected with HIV, that are critical for understanding the HIV epidemic in a particular context, for HIV service planning and for economic and developmental risk analysis.

What is needed in PNG is a figure for the HIV prevalence rate in the population which is grounded in reality. Is the 2007 estimate of 1.61 per cent of adults in the age group 15 to 49 such a figure?

The natural history of HIV epidemics

The first recorded cases of HIV in PNG, one man, one woman, were in 1987. The NACS/NDOH prevalence estimate is a shorthand way of saying that, in 20 years since then, the epidemic has expanded to directly affect a cumulative total of 1.6 per cent of the adult population.

Epidemics, like the virus when it enters a person's body, have what might be called a natural history. Once the epidemic enters a population, it expands, sometimes slowly, sometimes quickly. It may plateau for a while or longer. It may slow down. It may not. It may slow down and then start increasing again. It may reach saturation.

The prevalence estimate for PNG would indicate a slow rate of spread compared for example with almost all countries in sub-Saharan Africa.

The first recorded case of HIV in sub-Saharan Africa was diagnosed in 1982 in Uganda, five years earlier than in PNG. One thing that is known is that, in sub-Saharan Africa, almost all countries with generalised epidemics have prevalence rates higher than PNG, some as high as 20 or 25 per cent or more of their adult populations.

Hence the epidemic diffused rapidly through these populations although the rates and patterns of dispersal varied. In some countries in sub-Saharan

Africa, the epidemic spread very quickly at the start. Uganda, Zambia, Malawi, and the Democratic Republic of the Congo are examples. In other countries the initial spread was slower. South Africa, Swaziland, Botswana and Lesotho are examples. However, in these countries, the spread was measured but relentless.

By now, in most cases, infection rates in the slower starting countries are higher than in the countries of rapid initial spread. Infection rates reached 20 per cent or more in some of these countries, whilst 10 per cent is the approximate average for the other countries.

However, you might say, why choose Africa as a comparator? Thus, the estimated prevalence rate in PNG is higher than all other Pacific Island countries, and higher also than India.

Let us consider India. The first reported case in India was in 1986, a year before PNG. Until recently, the national HIV prevalence rate, based on the sentinel surveillance of antenatal centres, was estimated at 0.9 per cent.

In 2007, the National AIDS Control Office (NACO) revised this estimation to 0.36 per cent. Some months later the results of the first community based household bio-survey carried out by the National Family Health Survey 3 (sample size: 102,000) concluded: "HIV prevalence in the general population aged 15 to 49 is approximately 0.3 per cent and cannot be higher than 0.4 per cent under any reasonable assumptions"¹⁰.

Two different surveys, two different methodologies, two different results.

This competition in prevalence rates in a country has become increasingly common since USAID began funding small bio-surveys within the population-based Demographic and Health Surveys (DHS). Some countries, Ethiopia for example, reconcile the two estimates to establish one single point estimate¹¹. Others choose one estimate or the other although there seems to be a trend towards choosing the DHS estimate. This estimate is usually lower than that obtained from sentinel surveillance.

Whichever figure one chooses for India, India may provide an example of a generalised epidemic of similar duration to that in PNG with a lower national prevalence rate. However, not all agree that the epidemic in India is a generalised epidemic, not just because the national prevalence is below the definitional requirement of 1 per cent of the adult population, but they would claim that it is a 'risk group' driven epidemic, rather than a generalised epidemic.

¹⁰ "HIV Measurement Process and Prevalence". National Family Health Survey 3 2005-2006 Seminar Presentation ppt. <http://www.nfhsindia.org/seminar.html>

¹¹ **Federal Democratic Republic of Ethiopia: Report on Progress towards Implementation of the UN Declaration of Commitment on HIV/AIDS.** Federal HIV/AIDS Prevention and Control Office, 24 January 2008, p.16-18

What then is a generalised epidemic? And what determines how quickly an epidemic diffuses through a population?

A generalised epidemic

Generalised epidemics are contrasted with concentrated epidemics which are concentrated in certain places or among certain groups or populations. It is possible to understand the claim that an epidemic is generalised in a number of ways.

Firstly, the term can be understood geographically, that is, that an epidemic has spread throughout a geographic area, rather than being limited to certain groups or areas within it.

Secondly, generalised epidemics, like contained epidemics, can be understood through the social norms, values and practices that drive or constrain the epidemic. In contained epidemics, the sexual (or drug using) networks are relatively impermeable. The virus passes predominantly between and amongst the people within the group.

In the case of generalised epidemics, the network of sexual connections is open, reaching beyond an area or group. The network usually involves both women and men. Open sexual networks disperse the epidemic in swirls and flows across topologies of relationships and movement.

Another conceptualisation of a generalised epidemic is linked to 'risk group' based analyses. In these accounts, generalised epidemics are often described as epidemics where "HIV is *mostly* in the general population"¹².

Epidemiological conceptions of risk group driven epidemics

Locution such as 'being mainly in the general population' arise from an epidemiological conceptualisation of the epidemic as having its origins in what have been variously described as 'risk groups', 'risk behaviours' and/or 'risk settings'. Thus a description of epidemic dynamics drawn from this conceptualisation might go:

The dynamic of the epidemic follows a predictable course. A rapid increase occurs in the most vulnerable group eg. the FSWs [female sex workers] and IDUs [intravenous drug users] as the first step. It spreads via the 'bridge population' of the clients of female sex workers (such as truck drivers, labour migrants, the uniformed services, business men, students, and partners of injecting drug

¹² For example: Edward Green, Harvard School of Public Health, quoted in Erin Roach, AIDS in Africa: Behaviour change leads to HIV decline. Baptist Press. Posted Nov 30, 2007. <http://www.bpnews.net/bpnews.asp?ID=26930> . Accessed 6 December 2007.

users). HIV/AIDS spreads from this bridge population to the general population including the wives and partners of the clients.¹³

Similar locutions appear in the 2007 Estimation Report on the HIV Epidemic in PNG, which speaks, for example, of “behaviours and other characteristics within the general population and groups at higher risk”¹⁴.

In this model of epidemic dynamics, generalised epidemics begin in risk groups, sometimes called vulnerable groups, and result in generalised epidemics if they are not contained in the generating groups.

This is a transnational conceptualisation of the epidemic in that it permeates the discourses of international HIV-related institutions and of the global response to the epidemic.

The impact on members of risk groups

While epidemiologists may be comfortable with such analyses, the consequences can be quite serious. Here I am not challenging the accuracy as descriptions of the dynamics of certain epidemics. Rather, I am saying that their use can have repercussions that are harmful in themselves and which may contribute to further spread of the epidemic.

Locutions such as “mostly in the general population” and “the general population and groups at higher risk” imply that the members of these groups are not in the ‘general population’.

Further they bring with them assumptions about the members of these groups. The most harmful assumption is that the members of these groups are the ‘core transmitters’, the drivers of the epidemic: it is they and those with whom they interact, the ‘bridging populations’, who bring the epidemic into the ‘general population’.

This contributes to the further censoring and condemnation of already marginalised and stigmatised groups. It locates the responsibility for an epidemic within a risk group. Women especially are named and blamed as spreaders of the epidemic.

Risk group labelling also dehumanises, reducing complex human beings to a feature of interest to an epidemiologist: sex worker, drug user, etc. It denies to those concerned the humanity of people in the general population. Risk group analyses have also instilled a paralysing fear into the hearts of the wives and families of the truck drivers, uniformed services, fishermen and other categories that have featured in the risk group based bill boards, advertisements and other promotional material.

¹³ Nepal Millennium Development Goals: Progress Report 2005, UNDP Nepal, 2005. p.51

¹⁴ Op cit. p.16.

These conceptualisations of the epidemic have been accompanied by the assumption that if such groups are the drivers of the epidemic, interventions that target them, that single them out for attention, are the best way of slowing down the epidemic. They have become the 'target groups' for prevention strategies, in particular, for targeted interventions.

What evidence do we have that it is these people who are the drivers of the epidemic?

Evidence for risk group analyses

In generalised epidemics, the 'risk groups' named include sex workers, truck drivers, fishermen, the uniformed services, mobile men with money, and more. It should be noted that most of these are occupational categories, categories constructed to capture a set of epidemiological assumptions about the behaviour that fuels the epidemic and who practices that behaviour.

The reasoning might go. People who move around have sex when they are away from home. The categories of mobile people are truck drivers and fishermen, for example. Hence truck drivers and fishermen are risk groups for the epidemic. The evidence is mounting that these 'groups' are not the drivers of generalised epidemics, that the behaviours that spread the epidemic are either not particular to these groups or else occur just as much or more elsewhere.

For example, in data gathered in Lesotho in 2004-2005, where about 25 per cent of the adult population is estimated to be HIV infected, less than 2 per cent of men reported paying for sex in the previous year. On the other hand, 29 per cent reported having had multiple partners during that time¹⁵.

Data from the Indian 2005-2006 National Family Health Survey 3¹⁶ indicate that men who never leave their homes for long periods of time are just as likely to have multiple sexual partners as men who are mobile.

HIV infection rates can be higher among women who are not sex workers than among women in sex work. There have been examples of this from the start of the global epidemic, from Mexico City and Connecticut, for example. Support also comes from studies in Sydney which show that the

¹⁵ Ministry of Health and Social Welfare Lesotho, Bureau of Statistics Lesotho, ORC Macro. Lesotho demographic and health survey 2004-2005, quoted in James D Shelton. Ten myths and one truth about generalised HIV epidemics. *The Lancet* 2007; 370:1809-1811.

¹⁶ <http://www.nfhsindia.org/index.html>; quoted in **Solution Exchange: Action Group for Local Community Response to HIV**. Samraksha. Karnataka. November 2007. At <http://www.solutionexchange-un.net.in/aids/resource/res-01-270208-01.pdf>, p.12.

rate of STI infection among women in sex work is lower than for other women¹⁷.

Findings such as these question the accuracy as well as the explanatory usefulness of 'risk group' conceptualisations of the epidemic. In the Lesotho study, much more sexual activity was taking place outside of the 'risk group' and in the Indian study, men outside of the 'risk group' had the same patterns of mobility. Further it cannot be assumed, as we will see in the case of PNG, that women who work as sex workers have more sexual partners on average than other women.

Social consequences of using risk group analyses

One of the most serious social consequences of using a risk group analyses is the displacement of the immediacy of the epidemic. For as long as an epidemic is described as centred in such groups, it can be seen by those who do not see themselves as occupying these categories as something that does not affect them. It is a problem with Them, not us. This is a form of denial and a repudiation of responsible behaviour. It is also a psychological condition that feeds the epidemic.

Risk groups analyses also give a transgressive tinge to sex within the epidemic. Risk-group sex is constructed as extra-marital and considered by many as morally lax or worse. The epidemic is understood to be about what men, or women, do outside of marriage rather than about what men, or women, do within marriage.

As a direct consequence, transmission within marriage has been neglected, in the discourse of the epidemic and in prevention strategies, since it is sex outside of marriage rather than marital sex that is conceptually identified as driving the epidemic.

Because of this, many men, and women, find it difficult to admit, or even to realise, that their actions pose a threat to their spouses. This in turn has resulted in the infection of many wives, in particular. UNAIDS has estimated that ninety per cent of women with HIV were infected by their husbands or steady partners.

In turn, its consequences are seen in the increasing numbers of children left without parents by the epidemic and in the terrible trauma that children with infected parents suffer.

'Risk groups' and the epidemic in PNG

There is not evidence to support a conceptualisation of the epidemic in PNG as driven by risk groups, that is, to support claims that the epidemic started in, or has been significantly driven by, these groups or settings.

¹⁷ Alison Murray. *Pink Fits: Sex, Subcultures, and Discourses in the Asia-Pacific*. Victoria: Monash University Press, 2001. p.113.

Early HIV-related contact tracing data, particularly that collected by Sr. Rose Bernard Groth SND, indicated open sexual networks, involving a range of actors, rural and urban, and various forms of transactional, survival, commercial, occasional and marital sex.

The findings, available nationally¹⁸, showed quite dense and geographically dispersed sexual networks. They were gendered connections with both men and women involved in the diffusion of the epidemic. The tangle of the network so created spread back and forth through towns, villages and mining areas, from the highlands to the coast and back, and across differences of ethnicity, of locality, of gender, and of status.

The nodes of these networks do not in themselves constitute risk groups or risk settings as those terms are used in ‘risk group’ analyses of the epidemic. They are just the intersections of people’s daily lives.

Furthermore, sexual transactions in PNG are resistant to simple, binary classifications, for example, commercial or non-commercial. Commercial sex work is often further divided into street-based, brothel-based, hotel-based, home-based, etc. sex work. More recently and programmatically interestingly, the categories of open, partially open and hidden sex work have been developed¹⁹.

Again, these do not seem to capture the complex reality of sexual interactions in the PNG context.

The discourse of ‘risk groups’ in PNG

Risk groups and risk settings may not be the drivers of the epidemic in PNG but they feature significantly in the *discourse* in PNG about the epidemic. At the very start of the epidemic, the locutions used were drawn from the international discourse on the epidemic. This was inevitable given that national departments of health drew extensively on technical advice from the World Health Organisation.

WHO, UNAIDS, and other international organisations and bilateral donors developed their understanding of generalised epidemics from contained epidemics. In this way, ‘risk group’ conceptualisations of generalised epidemics emerged.

The 1987 PNG National Department of Health Circular reporting the first cases of HIV infection identified the woman as a “prostitute” from

¹⁸ For example, they were presented to the First National Medium Term Plan Strategies to Action Workshop, Port Moresby, 3-7 August 1998.

¹⁹ See for example the work of Samraksha in Karnataka State, India:
http://samuha.gn.apc.org/html/hiv_aids2.html

Madang²⁰. Its leading recommendation was to avoid having “sex with people who have AIDS or might have AIDS, such as promiscuous people in urban areas.”

These locutions of prostitution and promiscuity were picked up by some of the few organisations who were then responding to the epidemic. The HIV materials of one of the active church organisations referred to ‘*pamuk meris*’ or prostitutes, and used the verb ‘*pamuk*’, the activity of being sexually loose, which applies to both men and women²¹. However these references were soon removed from their literature as people reflected on their actual experience on the ground. They did not ring true to the realities of PNG.

Sex and the epidemic

So what is known about sexuality and sexual interactions in PNG?

Traditionally in PNG there was a multiplicity of forms of sexual exchange. These included hospitality sex, sex in exchange for food, ritual sex, sex for protection, sex for trade goods, sex in warfare, sex in exchange for labour in gardens, and others²². This diversity of transactional and survival sexual exchanges has carried over into modernity, along with occasional sex, sex for pleasure and consensual and non-consensual marital sex.

Commercial sexual transactions, as understood in locutions such as “commercial sex workers”, are relatively recent phenomena in PNG. Forms of commercial sex include payday sex on the fringes of mines, plantations and businesses, and ‘wet lunch’ or lunch time sex near offices and businesses. Women in wage employment may sell sex to supplement their low wages or at times of need, for school fees or medical bills. Unemployed young women in the settlements may sell sex for similar reasons.

Brothel-based commercial sex is a relatively recent occurrence and its establishment, initially in Port Moresby and Mount Hagan, and later expansion has been linked to money laundering by the logging and other industries.

This multiplicity of sexual exchanges occurs throughout the country. Certain forms may be localised, *pasinja meris*²³, passenger women, amongst

²⁰ Circular No 112/87 of July 7 1987 from the Office of the Secretary for Health, National Department for Health, Subject: AIDS in PNG.

²¹ Personal communication, Katherine Lepani

²² Research data on culture, modernity and sexuality is summarised in Carol Jenkins. ‘HIV/AIDS, Culture, and Sexuality in Papua New Guinea’. In **Cultures and Contexts Matter: Understanding and Preventing HIV in the Pacific**. Asian Development Bank. Philippines. 2007. pp. 5 - 69

²³ See, for example, Holly Wardlow. ‘Anger, Economy and Female Agency: Problematizing “Prostitution” and “Sex Work” among the Huli of Papua New Guinea’. *Signs: Journal of Culture and Society*, 2004, Vol 29, no.4, pp. 1017-1040.

the Huli of Southern Highlands Province, for example, but the phenomenon is ubiquitous, rather than a predominantly urban or risk setting occurrence. Furthermore, the ADB study shows that women involved in transactional or survival sex may have as many partners as women who identify as full time commercial sex workers²⁴.

Thus, the claim that the epidemic is generalised in PNG is a claim about it being diffused throughout the country. But it is also a claim that it spreads through extensive and diverse sexual networks that capture a multiplicity of forms of sexual interactions. These may be consensual or involuntary, acts of necessity or desire or force, and predominantly but not solely between men and women.

How does this throw light on the interrogation of the HIV prevalence estimate? Importantly, it shows the potential for spread that exists if protected or safe sex is not practiced in these sexual networks. However, it does not shed light on how far the epidemic has spread into the networks.

Multiple partners and generalised epidemics

The conceptualisation of the epidemic in terms of risk groups or settings, and as essentially transgressive or extra-marital, has led to an assumption that the sexual encounters which drive the epidemic are mainly transient encounters with multiple and different partners: one client after another; one truck stop after another. The model is that of serial monogamy in fast forward.

This assumption is now being questioned. Data from Africa does indicate that the epidemic diffuses more quickly where people have multiple partners but more rapid spread occurs where these partners are regular or concurrent sexual partners, as distinct from multiple partners which are seriatim.

To understand this, one needs to understand the dynamics of viral presence in the body. There is a short period of time after a person first becomes infected, probably two weeks or more, during which the virus quickly replicates in the body as the immune system struggles to respond. It is during this period, when viral load is high, that HIV transmission is highly likely to occur.

The probability that a person will infect another person, sexually or perinatally, including through breast feeding, during this period is very high. The likelihood of infection during this period increases also where STIs are endemic and if sex is non-consensual or brutal.

Where there are concurrent sexual partners, many or all could be infected in a relatively short period of time. Where these partners have other steady partners, they in turn are highly likely to infect them in turn during their

²⁴ Op. cit. p.53.

period of high infectivity. Where the sexual partners are sequential and so come one after the other, only the partner(s) who is involved sexually during this short period of high infectivity has a significant chance of being infected.

On average, Africans have no more sexual partners over a life time than people elsewhere, but they are more likely to have a small number of long-term partners at the same time²⁵.

Many people in PNG, both rural and urban, have a plurality of sexual partners. What is not clear is the extent to which these partners are seriatim or concurrent. Research on rural men's extramarital sexuality indicates two patterns: sex while away from home²⁶, which could approximate seriatim partnership, and sex with single, divorced or separated women in their own or nearby villages²⁷ which could be closer to concurrent partnership.

Certain cultural practices increase the likelihood of concurrent infection. For example, both rural and urban men engage in group sex and group rape, practices which put men at risk from each other when one or more men in the group are newly infected. There is a critical need for greater knowledge of patterns of sexual partnering in PNG.

A clustering epidemic

The claim that an epidemic is generalised is not a claim for evenness of distribution. A marked feature of generalised HIV epidemics has been their propensity to cluster, be that in families, in geographic areas, in occupations, by age and gender, etc.

This is as true at the national level as it is locally. Thus in surveillance data in India, the prevalence estimates range from 0.07 per cent in Uttar Pradesh to 1.13 in Manipur, with four states (Andhra Pradesh, Karnataka, Maharashtra and Nagaland) around 1 per cent of the adult population.

The clustering may mirror patterns of economic activity or wealth accumulation, in villages or in towns. For example, in September 2006, at a WHO meeting, the then Minister for Health and Minister assisting the Prime Minister on HIV/AIDS, reported as confirmed that, at Porgera gold mine, HIV infection rates of 12 per cent of the workforce had been recorded and that

²⁵ Helen Epstein citing studies by WHO and others. *Battling AIDS in Africa: The HIV Superhighway*. Washington Post, November 25, 2007, Page B01.

²⁶ For example, Holly Wardlow. 'Men's Extramarital Sexuality in Rural Papua New Guinea'. *American Journal of Public Health*; Jun 2007; Vol 97, No. 6, pp.1006-1014.

²⁷ **Cultures and Contexts Matter: Understanding and Preventing HIV in the Pacific**. Asian Development Bank. Philippines. 2007. p.48.

and in other areas rates as high as 15 percent had been recorded²⁸. Recent data from Porgera indicate that the infection rate in people coming to be tested in the hospital in Porgera is about 10 per cent.

The clustering may occur in certain cultural settings or around certain cultural values or practices. For example, as traditionally happened in parts of PNG, if people in a village had sexual contact only with each other or with people in the locality, the epidemic would be clustered in the village and its surrounding area.

Clustering occurs in certain occupations, including teachers and health care workers²⁹. Wealthy elites standardly have higher infection rates than other groups, including the poor. The clustering may be local, reflecting local flows of people, knowledge and practices, and/or more localised sexual networks.

It can be rural clustering, where, for example, some villages or clans may be more seriously affected than others. Thus there are local narratives emerging around Lake Kopyago in Southern Highlands Province where people say of a village or clan: “HIV is full up over there”³⁰. In so saying, they are acknowledging uneven distribution. There are similar narratives in Port Moresby: “Nine Mile is full up”.

Chaos theory tells us to expect clustering to occur without easily predictable causal factors. We can witness chaos in the spread of epidemics as unpredictable and unregularised complexities or clusters occur. In a generalised epidemic urban and rural clustering does occur. These clusters may be created out of chaos or they may be sites where the drivers of an epidemic converge. The drivers vary from place to place.

A gendered epidemic

The HIV epidemic is always clustered in young women, for reasons that are both biological and social. In this respect, the epidemic in PNG reflects generalised epidemics in Africa and elsewhere: the data show a clustering in women in the 20 to 29 year old age group³¹. For men, it occurs later in the 25 to 39 age group.

An interesting exception to this is India where the prevalence in young women is as low as for young men. This is a rare phenomenon and needs a social explanation.

²⁸ <http://www.thebody.com/content/news/art38597.html>, reporting an Associated Press article by Ray Lilley, 18 September 2006.

²⁹ For one story, see John Kian. *AIDS: My Brother's Story*. Pearson Longman. Melbourne. 2004.

³⁰ Personal communication, Nicole Haley.

³¹ Op cit., p.8.

Physiological vulnerability occurs in all young women up to their mid-twenties when their genital tracts mature. It is this in particular which leads to infection rates up to six or more times higher in young women than in young men. Hence since the physiological vulnerability is constant, the extent of exposure to the possibility of infection must be lower in young women in India.

The 2007 Estimation Report on the HIV Epidemic in PNG indicates a significantly gendered epidemic³². More women than men are estimated to be living with HIV infection: 58.5 per cent are women in 2007. Furthermore, more women than men are estimated to become newly infected in 2007: 59.7 per cent of new infections are in women.

The extent of feminisation of the epidemic claimed in these data is high and unusual. Interestingly has been not been widely remarked on since the release of the report. It may, or may not, be a statistical artefact. The main source for sentinel surveillance is the testing of pregnant women in a limited number of health centres. This leads to a greater number of women being tested than men.

Thus the feminised nature of the epidemic may also be a statistical artefact. Unfortunately, it reinforces the narratives of blame in which women figure so prominently.

Temporal clustering and elections

As outlined above, the rate of HIV infection in communities varies according to whether people tend to have serial partners or a number of regular steady partners³³. The situation in PNG during the elections differs from either of these scenarios. Research shows that, in many places, especially in the Highlands, this is a period of significantly heightened sexual activity for both men and women.

There are increased flows of money in communities as votes are bought. Candidates set up campaign houses where sexual activities, gambling, drinking and in general heightened social activity take place. Campaign workers enter into marriages in order to get whole family or clan lines to vote for his candidate. Married couples dissolve their marriages for the duration of the election period so that each can go their own way. The marriages are reformed after the elections without recrimination. One study estimates that men and women may have on average seven different sexual partners during this period³⁴.

³² Op cit., p.29.

³³ See also, Helen Epstein. **The Invisible Cure: Africa, the West and the Fight against AIDS**. New York: Farrar, Straus and Giroux, 2007

³⁴ Philip Gibbs and Marie Mondu. 'The Context of HIV Transmission during the 2007 Elections in the Enga Province, Papua New Guinea'. SSGM Research Paper. Australian National University, February 2008. Forthcoming.

These factors could lead to a considerable amplification of the epidemic. If people were to become newly infected during this time period, they could pass the infection on to a number of their sexual partners who would themselves move into a period of increased infectiousness and so too in turn transmit the infection to their sexual partners.

This would cause a temporal clustering in new infections which would continue during the course of infection, somewhat similar to a chicken being ingested by a python.

The programmatic response in PNG

In 2003 a High Risk Setting Strategy (HRSS) was introduced as the central prevention strategy of the PNG national response to the epidemic. The goal of the HRSS is “to facilitate and sustain behaviour change to minimize HIV/AIDS and STI transmission and increase awareness in high risk settings in PNG”. The HRSS is described as an emergency response designed to focus efforts on bringing about behaviour change in settings throughout the country where HIV transmission is known to be high or likely to be high.

The HRSS identifies the following five prioritized high risk settings:

- Settings where people negotiate for sex: young women engaging in unsafe sex, young men engaging in unsafe sex, priority settings (nightclubs)
- Highlands Highway and ports of Lae and Madang
- Disciplinary Forces: police, defence, CIS, and security firms
- Private Industries: mining and petroleum sites, fisheries and canneries sites, construction sites, palm oil sites
- Youth at Risk in the National Capital District: unemployed youth in settlements, in-school youth, youth in uniform, youth involved in sex trade.

There are a number of observations that can be made about the strategy. Firstly, there are sites where there is much more sexual activity than others. A prevention portfolio must include a focus on these. Our analysis so far has pointed out that the networks of transmission are open and extended and that there is clustering as well as dispersion. It is cost effective to include sites of clustering in a portfolio of prevention strategies. There does however remain a question of how best to work in these sites. The range of options includes but is not limited to targeted interventions.

Secondly the discourse of ‘high risk settings’ can lead to stigmatisation and blaming of those in those settings, in particular, female sex workers, settlement dwellers, and unemployed youth. It can also cause a backlash

amongst those living in areas identified for interventions under the strategy as they resist being called a high risk setting or, by inference, a high risk group.

However the key criticism of this approach is that there are many drivers of the epidemic that are not caught up in this conceptualisation. It reflects a limited understanding of the epidemic dynamics in PNG. The problem lies in the reliance on this strategy as the basic prevention strategy.

It also raises a critical programmatic question: how does one work most effectively in settings where the epidemic is clustered? The assumption behind the HRSS and other risk group/setting based analyses is that people sexually active in these groups/settings need to be targeted for prevention messages and technology. The effectiveness of these strategies, in PNG and elsewhere, has yet to be documented.

Driving forces of generalised epidemics

The openness and density of the sexual networks in PNG create conditions within which the epidemic could be rapidly diffused. Are there other possible driving forces?

Research into generalised epidemics has shown that certain social and economic factors or forces are associated with high rates of HIV infection. These include:

- Significant violence towards women, whatever forms the violence takes
- Significant socio-economic stratification, which is an indicator of inequitable development, and
- Weak social capital.

These factors may be referred to as the driving forces of the epidemic. Let me briefly elaborate on them. Research has shown that women who are the victims of violence, any form of violence, have a significantly higher likelihood of being HIV infected than other women.

Societies in which there are significant disparities between the rich and the poor have high rates of HIV infection in both the rich and the poor, standardly even higher in the rich and educated than among the poor. Effective response to the epidemic and its driving forces require collective rather than individual action. This in turn requires trust and mutual respect.

These factors are interrelated. Equitable development requires trust and a sense of the common good, what is often referred to as strong social capital. Trust and respect between men and women allay tendencies to violence, disempowerment or subjugation.

Not all of these factors apply to all high prevalence countries. However their identification constitutes a beginning of an understanding of the epidemic in terms of the socio-cultural structures that shape and constrain forms of individual and collective agency.

This is especially important in understanding the epidemic in PNG where various arrangements of cultural practices, social relationships and historical processes move people to act. Personhood and agency follow cultural logics and values and social action comes about in specific socio-cultural contexts.

All of the factors which influence the pattern and speed of spread of the epidemic are present in PNG. Women have a significant lifetime chance of being raped or pack raped. PNG has the greatest socio-economic disparity in the Asian and Pacific regions as measured by the Gini coefficient.

Binding or group social capital is present in PNG society in clan, house line and *wantok* groups. However, bridging social capital, social capital between such groups, is weak and stocks of trust and respect low. There is little sense of the common good beyond kin groups. This reinforces the contention that the potential for extensive and rapid spread of the epidemic exist.

Does this lead us to expect an HIV prevalence rate higher than the 1.61 per cent estimated?

What do I personally think?

The methods used to estimate HIV prevalence are clearly inadequate.

When I first thought about this statistic, I felt it was counterintuitive. This may well have been because other national prevalence figures that get used are so much higher and yet still seem, to me and others, to be in the realm of the possible.

And this latter is the crux of the matter. We cannot see this epidemic. We can only see and study the psychological, cultural, social, economic, political and other factors that could be driving it. From this we can come to know the potential for spread. It is worryingly high in PNG. The conditions are in place for rapid and extensive spread, whether or not it has already occurred.

I ask myself are there factors constraining the spread and here I suffer a failure of the imagination. We speculated that the stricter chaperoning of young girls in India might contribute to the low rate of infections in young girls. India is unique in the HIV world for having prevalence peak in women in the same age range as for men, rather than 10 to 15 years earlier.

But no such social, cultural or other constraining influences come to mind for PNG.

National data do not reflect local situations. The epidemic in PNG is clearly a clustered epidemic. Many people speculate that infection rates are high in Western Highlands Province. This is no doubt so. One month recently 30 out of the 140 people who came to be tested in one centre in Mt Hagan were found to be infected: over 21 per cent of attendees.

Nonetheless I suspect that there are other areas where infection rates are high. Lake Kopiago is one of the most isolated and cut off areas in PNG and yet people have worked out that some families and villages are seriously affected. Some testing results bear this out. In Mingende, just outside of Kundiawa in Chimbu Province, the figures at a counselling and testing centre for the same month were 20 out of 120: 17 per cent of attendees for that month.

I personally think that rates could be high in Gulf Province one of the most developmentally deprived parts of PNG. Gulf women, especially Kerima women, are known for their beauty. They are frequently raped, married early, abandoned, hassled, and more.

But more than that. When working with the staff of an NGO health centre in Port Moresby, which cares for people living with HIV, they told me that when a Highlands person is diagnosed, they are usually taken in and cared for by their families, either in Moresby or back in the Highlands.

Gulf people on the other hand are often rejected by their families and left in Moresby to die. Only then will the family turn up and only to claim the body for a traditional burial. The virus seems to spread in such societies. However, the ante-natal prevalence data for Kerema, the capital city of the province, was 0 per cent for 2006.

In Moresby, so many families I talk to, settlers and villagers as well as the elite, have someone in their family affected. I have seen this before in Africa and where it happened there surveillance systems were showing much higher prevalence levels.

However, it is statistically possible that there could be quite high pockets of infection and still the national average be 1.61 per cent. This is supported by the fact that the national HIV prevalence data for ante-natal centres collected in the surveillance system is 1.6 per cent. The range, however, is from 0 to 16 per cent for 2007.

But the question needs to be asked, not only about the coverage of the surveillance sites, but also what proportion of women go to health centres during their pregnancy? I have tried to check this out but the various figures I have been given do not seem very robust.

It is also possible that if we tested pregnant women in a greater number of sites we would find similarly high levels of infections as have been found in the high infection pockets.

So where do we stand?

I think that there is an ethical issue in releasing such data. The Report itself says that the “estimates should be considered with caution given the quality and quantity of the data used”³⁵.

Despite this, it revised downwards its previous estimates and issued what to many is a counterintuitive prevalence estimate. In so doing, it could be said that it creates the conditions for complacency: the feeding of denial, the diminishing of already weak political support, the undermining of efforts of the donor community and others to scale up the response and more.

This was recognised at its launch by the Minister of Health and HIV who stated: “The lower national HIV prevalence from previous years does not mean a decrease in the epidemic rather all projected HIV indicators show an increase”³⁶.

The World Bank is negotiating with the Government of PNG to carry out a bio-survey to determine prevalence rates. This will give us a snapshot of what is happening and hopefully will be able to give local prevalence levels as well as national averages. However, even if this comes to fruition, the results will be long in coming.

In the meantime, we have only the official prevalence estimate, data which is not representative of the population, nor does it cohere with some people’s intuitions.

Elizabeth Reid
Visiting Fellow Gender Relations Centre RSPAS
Australian National University
18 March 2008

³⁵ Op. cit. p.24

³⁶ Media release: New Estimates: The Face of the HIV Epidemic in PNG, NACS and NDOH, Port Moresby, 8 August 2007.
data.unaids.org/pub/PressRelease/2007/070808_png_new_data_en.pdf