TRACKING CHANGING SEXUAL BEHAVIOURS AMONG GAY & BI-SEXUAL MEN

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Project SIGMA tracked the changing sexual behaviour of gay and bi-sexual men in the UK by enticing participants to complete interviews about their sexual activities and general attitudes to safe sex, to keep monthly diaries of their sexual activities, and, in some cases, to provide a blood or saliva sample. As a stigmatised group, gay and bi-sexual men, particularly those who are young and/or from ethnic minority groups, as well as those who have not connected with the wider gay scene, proves challenging. This paper outlines the main complications experienced during Project SIGMA and the strategies adopted to address them. Particular attention is given to random walk sampling, confidentiality, building confidence with respondents, and persuading participants to keep diaries. A small number of men agreed to keep diaries over a considerable period. This paper also considers issues arising from the long-term collection of sexual behaviour data from this group.

Key words: hidden populations, diary research, longitudinal research, social networks, safe sex, HIV, AIDS

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Treating and preventing HIV and AIDS remains a high priority on the health agenda of most countries. This paper addresses the experiences of a series of research projects conducted in the United Kingdom under the research programme called Project SIGMA (*S*ocio-sexual *I*nvestigations of *G*ay *M*en and *A*IDS), funded by the Medical Research Council and the Department of Health (UK). Project SIGMA strove to uncover the sexual behaviour of men who have sex with men in the UK with an aims of identifying the extent of sexual behaviours which involve high and moderate risks of HIV transmission among such men, the sub-groups who engage in more risky behaviours, and the extent to which sexual behaviour has been changing in this community. These aims raised three complex methodological challenges: (1) sampling the community of men who have sex with men; (2) identifying the degree of moderate and high risk sexual behaviour; and (3) tracking changes in sexual behaviour over time. This paper addresses how we met these challenges both to contribute to the methodological debates and to enable others to learn from our mistakes.

1 SAMPLING THE COMMUNITY OF MEN WHO HAVE SEX WITH MEN

Project SIGMA, which began in 1982 and systematically collected data through the 1990s, examined the sexual behaviour of men who have sex with men. Effectively, this longitudinal study looked into the intimate affairs of gay and bi-sexual men as well as {ostensibly} straight men experimenting with same sex activities. Not all men who participated in the study self identify as gay or bi-sexual. Project SIGMA undertook five waves of data collection between 1986 and 1993. These waves involved the recruitment of respondents in London and Cardiff through advertisements in the gay press, visits to gay clubs, pubs and cruising grounds, and through voluntary organisations. The researchers made further contact with members of the social networks of the men identified in these initial outreaches. Recruited participants were interviewed, then asked to keep a one month diary of sexual activity following that interview.

Respondents received reply-paid (FREEPOST) envelopes for the return of the diaries. The Project collected over 2000 month-long sexual diaries (Coxon 1992, 1995, 1996).[2]

The study sought to track the occurrence of all forms of sexual behaviour and to identify circumstances in which high and moderate risk of transmission of HIV occurs. The population we sought to study is, in many ways, more hidden than the self-identified gay and bi-sexual population. Those men who are unsure of their sexuality or who are simply experimenting in youth are less likely to be reached through the gay press and gay venues. In the case of both young men and men from some ethnic minority communities, pressure from family members and the social networks of the family to avoid contact with anything which might be associated with gay men can be considerable. We return to the issue of contacting young men and men from ethnic minority communities later in this paper. First, we address the general sampling considerations of this study.

1.1 Snowball Sampling Informed by Sexual Networks

Many studies of gay men pay lip service to using snowball sampling methods, though not all follow through in a fully systematic way, and few give attention to the concepts, notions, and methodologies of network analysis. In this case, interest in sexual networks proved essential, as the population in which we were interested is sexually interlinked. The lone man who masturbates privately while looking at pictures of other men or fantasising about other men but who does not actually have sexual contact with other people is at no risk of HIV transmission. Consequently, while some men we would identify would be more isolated than others, no individual would be fully isolated. Moreover, to adopt the strategy of snowballing, one must assume that identified respondents have social contacts and are able to nominate others in their

[2] The hand-written natural-language diaries (in anonymised micro-fiche form) are archived in the Contemporary Medical Archives Centre of the Wellcome Institute , London, and accessible to bona fide researchers. The diaries are also encoded into a database format, where each record represents a sexual session. Special-purpose software, Sexual Diary Analysis (SDA) extracts information and counts from the records.

own social networks. Consequently, there is sound theoretical ground for combining the approaches.

Figure 1. Illustration Of Network Tracing

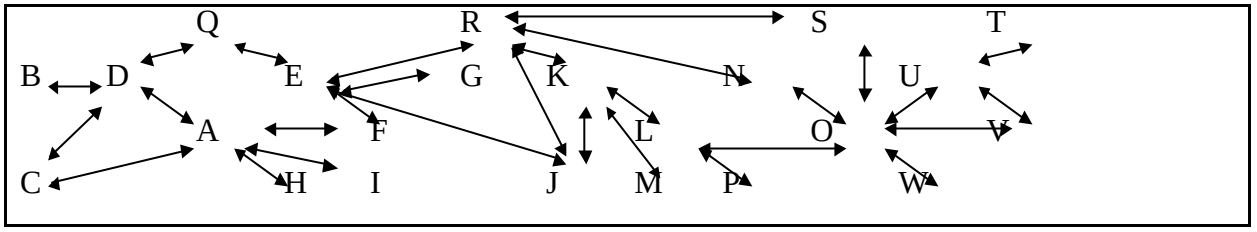
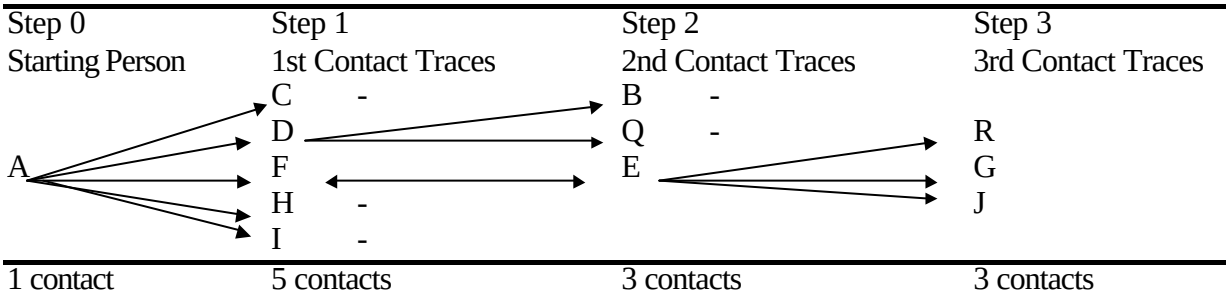


Figure 2. Sociogram Of Network Tracing



The question, then, is how to acquire systematic and largely unbiased information about a large network (in this case of men who have sex with men) whose parameters are unknown. Rapoport (1953, 1957) developed techniques for estimating the "gross statistical properties" of large neural networks whose boundaries were not known by measuring the degree to which links in the network were symmetric and/or transitive, and, thus, lead to close-knitted clusters of contacts (as opposed to being essentially random) which permitted efficient transmission through the network. Rapoport extended these same techniques to social networks of unknown size (1953). Fararo and Sunshine (1964) demonstrated that these techniques also worked with the study of social contacts between young offenders. The networking technique has since been widely refined and applied to studies of social networks of known size, but Rapoport's original application to networks of unknown size is more appropriate in this case. The technique involves identifying a number of nodes within the network, then tracing the number of contacts between each node and other nodes. The researcher then moves to the other nodes and counts the new contacts from these secondarily identified nodes and previously unidentified nodes. Figures 1 and 2 provide an illustration. If one started with node A, one would find first step contacts to nodes C,

D, H, I, and F. The connections between C and A and between C and D would not be counted as new tracings, as nodes A and D had already been identified. From node D, one would count as new tracings the connections to nodes B and Q, and from node F one would count the trace to node E. From node E, one would then count as new tracings the links to nodes R, G, and J (but not to F), and so forth. At each step in the tracing procedure, one identifies both the proportion of new nodes well as the cumulative proportion of nodes. This process is similar to another used in social science research and labelled by Coleman (1958) as "relational analysis", by Coleman et. al. (1966 - where doctors were asked to nominate the names of colleagues to whom they passed on information about new drugs) as "snowballing", and by Biernacki and Waldorf (1981) as "chain referral". If carried out in a logical and systematic way, the tracing technique improves the quality of snowball sampling from convenience sampling to a method which allows the possibility of estimating the population size.

1.2 The Tracing Methodology In Project SIGMA

Once a diarist was recruited by Project SIGMA, he was asked to identify the number of other men he knew who were in the same age and main relationship category,[3] and to provide some demographic details of these other men. Nevertheless, the Project was not able to fully implement the desired tracing sample approach. The researchers found that respondents were unwilling to participate in the study if they feared that they might put themselves or their contacts in danger of identification or worse by revealing details which hostile parties could use for destructive purposes. In part, Project SIGMA was able to allay these fears as all principal investigators and a majority of the Project staff were themselves gay or bisexual men, giving the research team

[3] The age categories used were under 21 (the age of consent to sex between men in England and Wales during the years of the project), 21-39 (the age group in which men would have grown up when consenting gay sex was legal in England and Wales) and older than 39, when men would have reached their teens when sex between men was illegal. The relationship categories were primarily in a closed relationship, primarily in an open relationship including both casual partners and at least one regular partner, and having only casual partners.

related vested interests in preventing the misuse of the information the Project sought to collect. The Project also had to ensure that the confidentiality of respondents and their contacts would be protected for both ethical reasons and to satisfy confidentiality requirements of the funding agencies. In consequence, two decisions were taken: (1) to assure respondents that no records of the names or addresses of any contact he identified would be recorded in any document or file of the Project; and (2) to ask diarists to approach the contacts they had identified to inquiry whether these contacts would be willing to participate in the study (Coxon 1995). Thus, while a number of men did approach the Project, having first been approached by another SIGMA diarist, there was no direct way to link the new diarist to the previous contact.

This is not to say that tracing was not possible. Using the descriptive data provided about each partner, the dates and locations where activities transpired, and the general course of the sexual encounters, it was possible to trace some partners with certainty, especially in the smaller and more close-knit community in Cardiff. A certain amount of flexibility had to be applied, as diarists rarely gave exactly the same level of detail about the encounter, or in some cases the same details about date and timing or nature of the partnership (Jason could consider Jim a regular partner, while Jim considers Jason to be a casual partner). Hence, partners were matched if another single diary had a close fit, rather than an exact fit (Coxon 1995). In some cases, it was not possible to distinguish partners from a small lists of candidate diaries. Even so, the closer the match of the dates during which the men completed the diaries, the more partner matches we were able to identify.

The Project also found that men who kept diaries after being approached by other diarists tended to be less "out" about their sexual behaviour than the respondents initially contacted through the gay press, pubs and clubs, cruising grounds and charities, and in this respect, some success was achieved in contacting the wider community of men who have sex with men (Coxon 1995). At the bottom line, however, SIGMA produced a pseudo-snowball sample of a comparable quality to those collected by similar studies (Coxon 1995).

The overall approach in this project nonetheless suffered from four shortcomings, which other projects would be wise to avoid (Coxon 1995).

(1) First, SIGMA found that many diarists were closely connected to other men who were *not* of the same age group and/or relationship type, reducing the efficacy of the later tracing.

(2) Second, the researchers did not develop clear procedures for identifying when the respondent had provided a "sufficient" number of contacts. Instead, this judgement was left to the interviewer and respondents themselves. A more systematic approach would yield more stable results from which to estimate the size of the network.

(3) Third, the blanket bar to recording specific identifying details to trace networks produced tracing problems. While the questions of confidentiality and protecting the respondents need to inform discussion of alternative approaches, it may well be possible to revise the procedures to allow for some more direct tracing to occur with the consent of all involved parties. In fact, many diarists did supply names and precise contact details[4] – this particular research simply made no use of this information.

(4) Fourth, SIGMA tended to achieve contact chain lengths of three individuals, where as we estimated that median chain lengths of four would have been necessary to estimate the size of the total populations, and chains of greater length would have been required to adequately estimate the size of the occasional members of the community who may have links via only one man (Davies 1986).

1.3 Studying The Behaviour Of Young Men And Men From Ethnic Minority Groups

A handful of the main Project Sigma diarists were under the age of 21 or members of minority ethnic groups. In 1995 and 1996, a special effort was made to contact and interview men who have sex with men from these two categories. Both groups are subject to even greater pressure than most white and older gay and bi-sexual men in Britain.

While the courts and national government have pressed for changes to laws and policies which have discriminated against adult gay and bi-sexual men, official legal sanction continues to restrict schools from providing supportive environments for young gay men and lesbians. The

[4] Many diarists happily supplied names, but also indicated that they did not want some named partners to find out that these particular diarists had named them (the partners) while talking with the researchers. Ultimately we adopted the strategy of asking for contacts to be identified by *initials* or by first name only.

primary legislation in this case, Section 28 of the Local Government Act, prohibits schools from engaging in any action which could be construed as "promoting" a homosexual, or "pretended family lifestyle". Attempts by the national government to remove this legislation in England and Wales and by the Scottish Parliament to remove similar legislation in the Scottish education system in 1999 and 2000 prompted widespread and vocal anti-gay backlash, culminating in a privately financed survey in Scotland which, in spite of its highly suspect methods and low response rate, claimed to find that over 70% of Scots favoured keeping the ban on the "promotion" of homosexuality in schools (Carrell 2000). In such a climate, it is little wonder that young gay men feel pressured to remain closeted.

Men from the Black and Asian communities in the UK likewise face pressure from within their ethnic groups to at least maintain a public appearance of heterosexuality (Bailey 1997). Though little direct research in the UK has investigated British minority community attitudes to homosexuality, evidence from the United States suggests that anti-gay sentiment can be particularly intense in these two communities (Bailey 1997).

To reach men from these communities, the Essex-based SIGMA researchers initially contacted former SIGMA diarists to start new snowball samples. The researchers aimed to contact 100 young gay and bi-sexual men, 50 black gay and bi-sexual men, and 50 Asian gay and bi-sexual men. To supplement the original sample, respondents were recruited through civic agencies and voluntary organisations which provide assistance to young people or to the Black or Asian communities in the UK and through GUM clinics in London. In addition, a review of the gay press revealed that a small but regular section of the personal ads aim at people from minority ethnic groups, so advertisements for respondents were also placed in the gay press. To enable respondents to feel secure in talking about their sexual activities, young white interviewers, and black and Asian interviewers were recruited from the civic and voluntary agencies where the advertisements for respondents were placed. These two sub-groups were not asked to keep diaries.

In the end, 78 men aged 25 and younger, and 95 men from minority ethnic groups (43 Asian, 33 Black, and 19 of mixed race) were interviewed. In response to an open-ended question relating to their perceptions of their sexuality, 27 of the young gay men indicated that they perceived that gay people enjoy more freedom and room to be creative than the majority of straight people. 23 of the young men indicated that they perceived that gay men formed stronger

friendship bonds than straight men, and 22 felt that gay people have more fun and lead healthier lifestyles than straight people. All of the younger men reported feeling comfortable with their sexuality, and 77% indicated that most or all of their friends and family knew that they were gay. These findings likely indicate that a sampling problem arose in the study of the young gay men, though it would be nice to think that social conditions had changed to the degree that genuinely would allow young people the latitude to be themselves without social sanctions. Half of these men either reported having only a regular sexual partner (19) or not having a current sexual partner (21). 14 reported having only casual sexual liaisons, while 23 saw both regular and casual partners.

The findings suggested that black, Asian and mixed race gay and bi-sexual men have distinctive experiences. While over 90% of the black men felt attracted exclusively to other men, ¼ of the Asian men and 15% of the men of mixed race reported feeling primarily attracted to women (Fisher 1997). Over 1/3 of Asian men felt uncomfortable with their sexuality, and 27.9% indicated that they would take a treatment to make themselves straight if one were available (Fisher 1997). Not surprisingly, 65% of the Asian men reported that they primarily identified their status as a member of an ethnic minority group. Black men were most likely to primarily feel black or to identify with both statuses equally, while men of mixed race were most likely to identify as primarily gay or as both gay and from an ethnic minority (Fisher 1997). Many of the black respondents felt their race proved an advantage to finding sexual partners (Fisher 1997). Disturbingly, 16 men in the ethnic minority sub-sample reported being raped by a man as a young boy, and most of these reported that the rapist had been a member of his family. (20 of the 78 young white men also reported being raped as a child, and 9 of them were raped by a male relative).

Over 80% of this ethnic minority sub-sample reported having engaged in anal intercourse (a much higher percentage than found in the wider SIGMA sample) (Fisher 1997, Coxon 1995). $1/5^{th}$ had had unprotected anal intercourse with a regular partner in the last month, and $1/10^{th}$ had had unprotected anal intercourse with a casual partner in the same time frame (Fisher 1997). 54 (57.4%) had required treatment at a clinic for sexually transmitted diseases, and 47 had had to seek such treatment in the last year (Fisher 1997). While 59 men from ethnic minority communities relied on the gay press for information about safer sex, only 24 relied on health professionals for such information, and 38 reported that they did not trust health professionals for

information on HIV. At the very least, the SIGMA findings demonstrate a need to specifically consider the sexual activities of men from ethnic minority groups in sufficient numbers to be able to draw conclusions in studies of the sexual behaviour of men who have sex with men.

2 ESTIMATING THE DEGREE OF RISK IN SEXUAL BEHAVIOUR

While sexual activity is widely acknowledged as a primary method of transmission of the HIV virus, the calculation of risk associated with various sexual behaviours requires explicit details of all activities rather than simply those known to be associated with the highest risk, namely anal and vaginal intercourse to ejaculation in which a condom is not used. Even if semen is deposited on the floor, a risk of transmission occurs if one party has a wound or sore on a foot or hand which comes in contact with the semen at a later point. To identify risk is sexual behaviour, it is therefore necessary to identify all possible points at which bodily fluids might be exchanged. At the same time, research of this nature crosses two public discourses which can provide strong incentives to respondents to provide socially acceptable responses. On the one hand, most respondents are aware that they will be harshly judged by the wider British public if they are exposed as have behaved in a sexually irresponsible manner. On the other hand, men also have an incentive to exaggerate the frequency and duration of sexual exploits.

There are three main ways to collect the explicit details required for such research: direct observation, direct questioning, and diary data collection.[5] One can directly observe intimate

[5] Project SIGMA also collected blood and saliva samples from a majority of respondents. An anonymised coding process was developed so that records matching samples with names and addresses were in physically separate locations and matched by a complex, multi-stage process never recorded in any document and known only to two researchers on the project. Diarists who supplied samples were given the option of being informed of the result. Project researchers who had trained to counsel people while revealing HIV test results advised those respondents who wanted to know the test outcome of their results. A number of diarists chose not to be informed of the outcome of the tests, though many also indicated that they preferred to receive such

activities, as Masters and Johnson (1966) and Humphries (1970) did in the 1960s, or one can use contemporary surveillance equipment. A number of serious problems arise with direct observation. Covert observation denigrates the integrity of the people observed, is illegal in many contexts, and entails high costs and technical impracticalities if one is interested in general behaviours as opposed to behaviours occurring only in a specific type of location, such public toilets. Known observation can influence behaviour, is likely to attract the consent of only a highly select an unrepresentative group, and also entails high costs. In England and Wales (though not Scotland), such observation would be illegal under the 1967 Sexual Offences Act, which prohibits the presence of non-participatory individuals during private homosexual activity.

A second approach involves asking respondents directly if and how often they engage in various sexual activities. Early phases of Project SIGMA employed an "Inventory of Sexual Behaviour" (ISB) battery of sexual activity frequency questions in the main questionnaire. The answers provided to the ISB, however, raised numerous concerns. Replies appeared rounded, vague and approximate, and respondents tended to give different answers if asked the same question at a later interview or even later in the same interview (Coxon 1988; Coxon et. al. 1992). Moreover, when partners were asked the same questions about recent sessions, answers of each party seldom matched (Coxon 1988).

In hindsight, the problems which emerged with the ISB are not surprising in the context of research into the validity and reliability of answers people give to direct questions regarding frequency and duration of other kinds of regular activities on questionnaires. Time diary researchers have compared estimates people gave for a range of activities, from time spent preparing food, shopping or cleaning the house (Gershuny 2000; Vanek 1974), number of times visiting a gym or swimming pool over a month (Chase and Godbey 1983), frequency and duration of personal care activities (Erlich 1987) – and even time spent doing paid work (Gershuny 2000, Robinson and Godbey 1997, Robinson and Gershuny 1994) - with time diary records and logs recording entrance and exit times to gyms and business establishments, and found that people give notoriously inaccurate answers which can range from being off by ¼ hour to under or over reporting behaviours by 100%. If people do not know how long they work, why

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information outside of the NHS context, as they did not trust the security of the information in the NHS.

should we expect them to give accurate answers to questions about the duration and frequency of sexual activities?

Direct questions asking for the number of times which people did a particular activity or the duration for which they usually do the activity elicit the information out of context of the sequence of events in which the respondents normally experience the activity. In the case of sexual behaviour in particular, the context in which acts take place is centrally involved to the meaning of the behaviour for respondents (Coxon 1994). To understand risk behaviour, it is important to distinguish the individuals who enjoy or at least are willing to undertake risk generally from the people who tend to engage in high risk behaviours in certain contexts but not in others. The policy implications for each group are distinct. Moreover, the sequencing of events themselves can impact the likelihood of disease transmission. As an example, the risk of catching hepatitis from a sexual partner is greater if oral sex follows anal intercourse rather than preceding it. Simply knowing that a risky behaviour has taken place therefore is not enough, and neither direct observation nor direct questions asking the frequency and duration of behaviour shed much light on this dimension of sexual behaviour. For these reasons, Project SIGMA shifted to the development of sexual diaries as the primary tool for collecting information about risk behaviour.

2.1 Why Use Sexual Diaries

Diaries form a natural part of human experience, and many people record various aspects of their lives, whether by keeping detailed written accounts of thoughts and feelings, making reminder lists of what needs to be done, or assembling collections pictures. Diaries, as Plummer aptly observes (1983) are "documents of life", as they permit people to record experiences as they understand them and in the context in which the understanding or reinterpretation of an event takes place. Some men keep sexual diaries for private reasons, including keeping a record of conquests or adventures, tracking people who may have passed on or to whom they have transmitted disease, or as an aide-memoire for future masturbation (Coxon 1994). Further, by tracking events in the context of their occurrence and in people's own words, diaries minimise recall bias and misinterpretation compared to other methods (Janson 1990).

Diaries are not unproblematic. Respondent burden is high, and attracting a reasonable response rate can prove challenging (though some diary studies do attract response rates of over 90% (Gershuny 2000; Fisher 2000). When the population sampled is a hidden population, as in the case of men who have sex with men, further selection bias emerges in the recruitment of diarists and initial sampling procedures which cannot be easily corrected by weighting (Coxon 1995). Similarly to other studies of volunteer bias (Rosenthal and Rosnow 1975), in Project SIGMA, more educated, higher social status, more sociable and approval-motivated (and, in this case, more sexually active), and more "out" gay and bi-sexual men completed diaries, though the degree of these effects is difficult to estimate (Coxon 1995). Of those respondents who start diaries, fewer finish. Even so, in the experience of Project SIGMA, the diary emerged as the "preferred (indeed the unique) method for obtaining certain sorts of information about the detail of" the sexual activity of men who have sex with men, though there is no reason to assume that the method should be limited to this context (Coxon 1994, 1996).

2.2 The Mechanics Of The Project SIGMA Diary

The Project SIGMA sexual diaries included four components for each sexual session (defined as one or more sexual acts with the same partner/s over an uninterrupted period of time). These included *(1) Time, Place and Antecedents* (month, day of week and hour, whose accommodation or what other location, and whether drugs or alcohol were used to enhance the experience); *(2) the Participants* (including a description of each of the partners, but not their names or directly identifying details, such as exact address); *(3) the Sequence of Sexual Activities Which Transpired*, and *(4) Accompaniments* (including condoms, lubricants or "toys"). To examine sexual risk behaviour, the sexual activity section collected a basic formula:

WHO does WHAT, TO WHOM, and with WHAT OUTCOME.

A particular emphasis was placed on determining whether ejaculation occurred, and if it did, where the semen went (into which person, onto which person, or elsewhere). This structure of a sexual session bears a striking resemblance to linguistic structures, and interpreting diary entries in this way "gives added insight to the analysis and meaning of sexual behaviour" (Coxon 1994). The "sentences" of each act are recorded from the perspective of the diarist, allowing each act to

be defined as *active* (the diarist did act x to his partner), *passive* (the partner did act x to the diarist), *mutual* (the diarist and his partner did x to each other at the same time), or *self* (the diarist did x to himself). The sentence of each act thus consists of:

MODE (active, passive, mutual, self) +

BEHAVIOUR (anal penetration, masturbation, etc) +

RESULT (ejaculation to specified destination or no ejaculation) +

MODIFIERS (lubricants, toys, poppers).

To train respondents to use this format, interviewers assisted respondents in completing a diary of the respondents' previous week's sexual activities. Following this interview, respondents were given a one month diary for completion and return. The diaries included instructions: (1) to only complete the diary if they were prepared to supply fully honest answers and not to embellish or censor their activities; (2) to record activities as soon as possible afterward, preferably on the same day as the acts took place; (3) and to record a separate account for each session.

2.3 Coding Sexual Diaries

When Project SIGMA started, few analysis programs could cope with the material collected in sexual diaries. The range of software which can analyse textual data has grown dramatically in the last few years, but as this project largely relied on software developed in-house, we now turn to the question of how this project coded the data. The project researchers developed a schema of coding, or "sexual behaviour code" (Coxon 1992), designed to accommodate the following needs:

1) including sufficient detail to capture all common and most rare sexual activities;
2) retaining flexibility for future modification;
3) encryptable to ensure secrecy and confidentiality;
4) comprehensible to subjects and to coders;
5) applicable to coding activities recorded in diaries, discussed in interviews, or directly observed.

This code also had to operate on the assumption that series of continuous motions could be defined as distinct and nearly universally recognised categories. While every individual may have

their own ways of doing sexual acts and while the same person may not do any given act the same way every time, acts tend to have basic common elements – using the hand to stimulate the penis manually is taken as a necessary part of masturbation. To make the process of discussing the sexual activities as comfortable as possible for respondents, the written material from the project used medical terms enclosed in brackets, while the interviewers used the street vernacular when talking to respondents. Thus, a written question like:

Has another man ever {masturbated} you until you {ejaculated}?

is spoken as:

Has another man every wanked you until you came?

As Table 1 below indicates, masturbation featured as the most prominent act in the SIGMA sexual diaries, followed by fellatio and anal intercourse, which collectively account for 93% of reported acts. Problems arise with the classification of some of the less frequent activities. Respondents used the word "massage" to describe activities ranging from merely running fingers over a partner's body, to muscle manipulation, to intercourse between thighs or other non-penetrative intercourse. For this reason, the more exhaustive list of activities that distinguished thigh-fucking from massage was presented to respondents to minimise the possibility for confusion of terms.

Table 2 displays the codes assigned to the modality of each act, and the two-part code assigned to the ejaculation result. A longer list of codes was assigned to the modifiers. The code for each act thus was constructed as the modality code + the behaviour code + the ejaculation outcome code + the ejaculation result code + the modifier code. While some diarists provided long hand accounts, others used the coded account. The code helped to assure anonymity. If another person read the diary entry in code form, they would not recognise what they were reading. This proved particularly important as diaries were mailed back in the post. For those respondents who had performed acts which had questionable legal status in the UK, the code ensured that police or other agencies which might intercept the diary would not be able to easily interpret the diary contents. Diaries returned in code also overcame the possibility that mailed diaries could be interpreted as pornography, and thus be *ipso facto* illegal.

Table 1. The Codes Assigned To Each Sexual Behaviour, And The Percentage Of Total Reported Activity For Which Each Activity Accounts

Behaviour	Code	Percentage of Acts
1. Masturbation (wanking)	W	62%
2. Fellation (sucking)	S	22%
3. Anal Intercourse (fucking)	F	9%
4. Anilingus (rimming)	Ri	3%
5. Body Massage	Ma	1%
6. Digital-anal insertion (fingering)	Fg	1%
7. Anobrachial insertion (fisting)	Fi	<1%
8. Corporal Punishment	Cp	<1%
9. Interfemoral penile insertion (thigh fucking)	Tf	<1%
10. Lindism (water sports)	Ws	<1%
11. Nipple tweaking or nibbling	Tt	<1%

Table 2. The Codes Assigned To Each Mode And Each Result

Mode	Code
Self Diarist	S
Partner	H
Active (diarist does act to partner)	A
Passive (partner does act to diarist)	P
Mutual (diarists do the act to each other)	M
Ejaculation Result	**Code**
The semen ended up in the diarist	M
The semen ended up in the partner	H
The semen ended up in a condom	C
The semen ended up on the partner	O
The semen ended up on the diarist	I
The semen ended up elsewhere (on the floor)	X
No ejaculation	N

2.4 Testing The Validity And Reliability Of The SIGMA Sexual Diaries

The project tested inter-coder reliability by training coders, then asking prospective coders to independently read the same diary, listen to a reading of a diary, and watch two three minute sections of the gay porn video *Gay Weekend II*, then code the actions of what they had read, listened to or observed. Inter-coder agreement was assessed using the Levenshtein distance test

(Sankoff and Kruskal 1983), achieving an adequate score of 0.08. In general, all coders detected the same number of ejaculation results and the same basic sequencing. Variations arose in recording of additional detail, such as deciding whether a hand sliding down the chest to the thigh remained on the penis long enough to count as an act of masturbation in between two acts of rubbing or simply counted as one act of rubbing.

As respondents were interviewed before completing diaries, the relative rates of reported sexual activity given to questionnaire answers were compared with the diary answers (after respondents had returned a diary). To ensure comparison of events in the same reference month, respondents were also sent an unannounced questionnaire asking them to estimate the total frequency of various sexual acts. The rank-order correlation between the aggregate interview estimates and aggregate diary counts lay at a modest level of T=0.77, though the linear correlation was much higher (r=0.93) (Coxon and Coxon 1993). A regression coefficient close to unity is achieved regressing diary counts on interview estimates (b=0.94 with the intercept at 15.5), which we take to mean that respondents generally over-estimate the frequency of their sexual activities in the retrospective recall (Coxon 1994).

The comparison of diary data with corresponding interview data is instructive (see Coxon 1999) , and has consequences for evaluating self-reported sexual behaviour. In brief:

- Questionnaire data on sexual behaviour yields consistently higher average estimates than diary counts;
- Comparing individual difference (diary - questionnaire) scores shows that 55% of questionnaire estimates of acts are higher than diary-counts, 20% are identical and 25% are under-estimates; and that
- Discrepancies are differentially located in different sexual acts. Masturbation and fellatio are systematically over-estimated in questionnaires. Estimates of anal intercourse without using a condom also are regularly inaccurate; though the variation occurs in different directions: insertive active partners under-estimate and receptive partners over-estimate the amount of highest-risk sex.

3 TRACKING CHANGES IN SEXUAL BEHAVIOUR OVER TIME

A major problem with tracking behavioural change by using the method of diaries is that panel attrition is great. In the SIGMA longitudinal study, the number who keep a diary decreased year on year, and less than 30 percent of those who in Wave One kept a month diary agreed to do so by Wave Five. However, in the 1993 special cohort (the "Gay Press" cohort of diarists, who also provided the initial validation data) we encouraged diarists to continue to keep a sexual diary as long as they were prepared to do so. Although the number of diarists tailed off, some men kept them through seven consecutive months, providing excellent estimates of individual stability of sexual behaviour. A few men have been persuaded to keep a diary for yet longer periods, and in some cases this period includes the actual sexual session where HIV transmission happened and after which HIV sero-conversion occurred.

Three intrepid men kept periodic monthly diaries between 1987 and 1995, producing 147 diaries between them. Although these three cases are not typical diarists, their familiarity with the diary process and their enjoyment of completing the diaries in detail resulted in their production of particularly rich and high quality diaries. All three lived in urban areas and were openly "out" gay men. Two held professional jobs and one ran a retail business. One completed diaries during his twenties, while the other two completed their diaries in their seventies. One used the SIGMA code in the SIGMA diary forms, while another hand wrote his accounts long-hand, and the third kept natural language, word-processed diaries.

Table 3 summarises the sexual activities of these three men. Diarist 2 (in his 70s) was far less sexually active than the other two long-term diarists (what is surprising is how active the two older men were!). While Diarist 1 had more sexual sessions per diary, diarist three performed more acts per session. As with the main SIGMA sample, these respondents reported that they most regularly masturbated and engaged in oral sex. Two of these three also frequently engaged in rimming, body massage, fingering, and acts involving nipples.[6] Diarists one and three also tended to occupy the higher risk position in sexual activity. Diarist one was the passive partner in anal intercourse in eight sessions for every one session where he was the active partner, and

[6] These two diarists did not record this activity with clarity, though the coder had the impression that the range of acts covered under this heading varied considerably by partner.

Diarist three was the passive partner in the same act more than twice as often as he was the active partner. Both these diarists also sucked and rimmed partners more than they themselves were sucked or rimmed. Table 4 shows the frequency with which each diarists reported various acts.

Table 3. Summary Sexual Diary Information Of The Long-Term Diarists

	Diarist One	*Diarist Two*	*Diarist Three*
Number of diaries	56	45	46
Total number of sexual sessions	2028	500	991
Mean sexual session per diary	36.21	11.11	21.54
Total number of sexual acts	5112	693	3672
Mean number acts per session	2.52	1.38	3.70

Table 4. Reporting Of Most Frequent Sexual Acts By The Three Long-Term Diarists

Sexual Act	**Diarist One**	**Diarist Two**	**Diarist Three**
Masturbation:			
on own	888 (18.5%)	189 (34.4%)	992 (35.1%)
with others during a session	258 (5.4%)	323 (58.8%)	431 (15.2%)
Fellation:			
active (sucking partner)	1300 (27.1%)	4 (0.7%)	213 (7.5%)
passive (being sucked)	160 (3.3%)	8 (1.5%)	168 (5.9%)
mutual sucking	204 (4.2%)	6 (1.1%)	122 (4.3%)
Anal Intercourse:			
active (inserter)	14 (0.3%)	0 (0.0%)	63 (2.2%)
passive (insertee)	112 (2.3%)	0 (0.0%)	161 (5.7%)
Anilingus (rimming)	622 (13.0%) (4 receptive)	0 (0.0%)	97 (3.4%)
Body Massage	252 (5.2%)	17 (3.1%)	169 (6.0%)
Digital-anal insertion (fingering)	636 (13.2%)	2 (0.4%)	122 (4.3%)
Nipple tweaking or nibbling	356 (7.4%)	0 (0.0%)	292 (10.3%)

Over time, two of the diarists maintained consisted types of sexual relationships. Diarist two saw only casual partners, while diarist one maintained some regular relationships while also seeing casual sexual partners. Diarist three, who engaged in the highest risk practices, moved from seeing only casual partners in early 1988, to seeing regular and casual partners from late

1988 through 1990. He then returned to seeing only casual partners in 1992, then entered a long-term relationship from 1993, while still seeing the odd casual partner on the side.

All three long-term diarists entered the study as HIV-negative respondents. In 1995, Diarist one learned that he had become HIV positive. He then kept two monthly diaries following this diagnosis. Prior to this diagnosis, Diarist one had used condoms in 29.8% of anal intercourse acts. Following the diagnosis, he reported no high risk activity, greatly reduced his number of partners and number of sexual sessions, and only ejaculated following masturbation. His final two diaries included formal, short, and unemotional accounts, contrasting sharply with the rich detail of his previous diaries. Diarist three, who did not use condoms in 91.4% of passive anal intercourse which ended in orgasm (and who used condoms during anal intercourse ending in orgasm with 29.8% of casual and one-off partners), remained HIV negative when he completed his final diary.

4 CONCLUSIONS

The SIGMA project, which spanned twenty-years of data collection, (and continues, though in rather different form as it is no longer funded to carry out longitudinal research), has demonstrated four important lessons from its experience of monitoring gay men's sexual lifestyles.

First, *multi-method approaches are not a luxury, but a necessity*. It is not simply that different methods yield different sorts of information; they also make convergent validation a realistic option – and a necessary one, given the divergences we have experienced. This has involved adapting and developing new methods for new situations, in this case creating the sexual diaries and "life-history" relationship charts, as well as systematically recording of sexual encounters in Public Sex Environments.

Second, we found that, given the right motivation – and not least "the opportunity to play a part in the fight against Aids" as we originally put it – *gay men are prepared to yield remarkably intimate and honest information to social science researchers*, even when that information is sensitive (such as sex involving someone under the current age of consent) or even likely to attract blame (such as incidents of unprotected anal intercourse in sero-discordant

couples). In our case, this trust was undoubtedly helped by openly making it clear fom the start that all the Investigators of the Project were gay and bisexual men. The obverse of this is that we have a responsibility not only to ensure that factual information is made available for bona fide researchers and responsible policy-makers (as in the case of the House of Commons, Social Services Committee) as well as to answer the ill-informed attacks of homophobic lobbies, but also to give back to the gay community what benefits the Project could offer, such as making respondents' HIV antibody status available to them outside of the National Health Service, where many believed that such information was insecure. The Project also provided Hepatitis vaccinations to interested participants without producing formal NHS records.

Third, we found that a *purely medical research environment is not best-adapted to obtaining significant data*. Though funded by the UK Medical Research Council and Department of Health, and we were involved in obtaining blood and saliva samples in naturalistic (non-clinic) settings, our prime focus was on the broadly behavioural and social aspects of gay men's behaviour. In one major site, the (then) GUM clinic had a poor reputation in terms of gay men's concerns, and may respondents were deeply suspicious of the Clinic. This meant that, being independent of it, we could the more easily recruit those who did not attend the Clinic, and also those who were antagonistic to it– and were thus able to provide an early estimate of HIV infection in non-clinic based homosexual populations. This, together with the potential role-conflict of being "safe-sex guardians" (for pre-counselling those who took the HIV antibody test) and later (in the interview) attempting to elicit instances of unsafe sexual behaviour (Coxon 1993), meant that we were seen neither to be guardians of medicalised safe-sex nor to be implicated directly in the clinical set-up. (That said, our Clinical Investigator ensured that the Project complied with medical norms and procedures).

Fourth, and finally, in terms of the subject of this paper, the use of multi-method procedures meant that both the reliability and validity of the measures of sexual activity and risk activity could be directly ESTABLISHED and thus provide assured means of tracing the necessary detail of their sexual behaviour – how many engaged in sexual activities, how much of it was engaged in – and how the two are related in terms of concentration of risk (Coxon and McManus 2000).

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