



The role of perceived risk in general practitioners' decisions to inform partners of HIV-infected patients

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Objectives. To investigate the role of physician and patient characteristics in determining risk perceptions and decision making in a hypothetical case where confidentiality may need to be broken to protect the partner of a patient who is infected with HIV. To identify if risk perceptions mediate the relation between physician and patient characteristics and confidentiality decisions.

Design. Analysis of a sample of 207 Irish general practitioners (GPs) randomly assigned to one of four experimental vignette conditions.

Methods. A single vignette scenario was presented to each GP within which a hypothetical male HIV patient was depicted as unwilling to disclose his HIV status to his partner. The hypothetical patient's use of protection (used, not used) and sexual orientation (heterosexual, homosexual) were varied systematically. GPs then estimated the risk the patient posed to the partner and the likelihood that they would break confidentiality to inform the partner of the patient's HIV status.

Results. Less experienced GPs and those who had broken confidentiality in the past were likely to indicate they would break confidentiality in response to the presented scenario. GPs were more likely to inform the partner when protection was not used during intercourse and when the relationship was heterosexual rather than homosexual. Risk perceptions partially mediated the relationship between the patient's use of protection and confidentiality decision ratings but did not explain the association between GP characteristics or patient sexuality and decision making.

Conclusion. Physician background characteristics and HIV patient sexual practice and orientation are associated with hypothetical partner notification decisions. The perceived risk to the partner only partially explained the relation between patient use of protection and decision making.

Following the development of anti-retroviral medication and the associated increase in longevity expectations, general medical practitioners (GPs) are becoming increasingly

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important in the prevention, screening, continuous care, and monitoring of HIV infection (Burns *et al.*, 2008; Moatti *et al.*, 1995). GPs 'front line' position in HIV patient care has been assisted by a weakening of attitudinal and structural deterrents to GP care such as a decrease in stigmatization of HIV, an increased willingness to treat such patients, and better communication between specialized hospital units and primary care services (Bayer, 1992). However, several potential barriers to GP care remain, including the lack of clarity in regard to complex clinical, ethical, and legal obligations to patients and third parties, which may arise when working with patients with HIV (Melchert & Patterson, 1999).

Confidentiality is a fundamental foundation of medical ethics that promotes trust between health practitioners and patients (Guedj, Munoz Sastre, Mullet, & Sorum, 2006). Confidentiality is particularly important in the case of HIV as public knowledge of a patient's HIV status could lead to an array of negative consequences such as social rejection, financial destitution, and even violence (Paauw & O'Neill, 1990; Whetten-Goldstein, Nguyen, & Sugarman, 2001). Uncertainty regarding confidentiality may deter those at high risk of HIV from seeking out opportunities for testing and those with HIV may not disclose potential concerns for a partner to their GP (Petchey, Farnsworth, & Williams, 2000).

Whilst confidentiality rights are central to medical ethics, it is recognized in many countries that confidentiality may be broken in special cases such as when the patient poses a threat of serious harm to himself or others (Bayer, 1992; Totten, Lamb, & Reeder, 1990). Identifying if and when the behaviour of a HIV patient falls into the category of significant danger to others requires a complex case-by-case analysis. When a conflicting duty to protect exists, GPs must weigh up clinical, ethical, and legislative information in order to make difficult decisions about whether or not to break confidentiality to notify a potentially endangered sexual partner (Hook & Cleveland, 1999).

National medical ethical guidelines in the UK and Ireland have tried to narrow the focus of the decision-making process by specifying that the decision to notify a partner should only be made when that person is placed at 'serious risk' and the patient refuses to consent to disclosure (General Medical Council, 2004; Jones, 2001; The Medical Council, 2004). This decision rule functions primarily to set a bench-mark for the level of risk that must be present for an ethical obligation to disclose to exist. In this way, ethical guidelines place risk at the centre of the decision process making it clear that any factor considered must justifiably influence risk estimates.

Decision-making models that specify and weigh risk factors have been proposed to act as a more detailed guide for health care professionals and others when deciding whether to protect an endangered partner (Chenneville, 2000; Melchert & Patterson, 1999). A central approach of such models is to move towards more objective decision-making criteria by relating specific risk-related behaviours to breaching options. However, in practice establishing exact or even broadly accurate risk levels associated with risk behaviours (e.g., sexual practices, needle sharing) can be difficult as behaviours interact with clinical factors such as the patient's current viral load (Quinn *et al.*, 2000).

Even if accurate objective risk measures were made available, subjective biases may enter the decision through reliance on intuitive reactions to the situation. This is particularly so where the consequence of a decision has substantial affective meaning leading to 'probability neglect' when focus is drawn to a particular outcome rather than the likelihood that outcome will occur (Slovic & Peters, 2006). The judgment of 'serious risk' and the decision that follows are therefore subjective and likely to be due to risk perceptions that are open to biasing influences.

Risk perception is central to a number of social cognitive models of health behaviours including the health belief model (Rosenstock, Strecher, & Becker, 1988), the protection motivation theory (Rogers, 1983), the health action process approach (Schwarzer & Renner, 2000), and the extended parallel process model (Witte, 1992). The self-regulation model (Leventhal, Meyer, & Nerenz, 1980) includes risk perception components that play a key role in determining health behaviour. Risk perception depends upon the perceived susceptibility of the individual to a negative outcome and the severity of the outcome's consequences (Weinstein, 2000). Perceptions of susceptibility are distinct from estimations of the likelihood of a risk occurring as they suggest personal vulnerability or resilience to the potential event. The severity of risk assesses the seriousness or the degree of harm a hazard would cause.

The exact way that ratings of susceptibility and severity combine to produce a risk perception remains to be determined, with both additive (e.g., Witte, 1998) and multiplicative (e.g., Weinstein, 2000) models proposed. However, risk perception goes beyond the individual, and it is a social and cultural construct reflecting values, symbols, history, and ideology (Weinstein, 1989). As Sutton (1999) outlines, other dimensions of risk identified include voluntariness (Do people face this risk voluntarily?), knowledge by the exposed (To what extent are the risks known precisely by the person exposed to the risk?), and control (If you are exposed to the risk, to what extent can you avoid the negative outcome?). Such characteristics have been related to perceptions of risk; however, how clinicians perceive the risk levels of their clients has received less empirical investigation.

Hammond (1996) suggests that health care workers and allied health professionals must tolerate unavoidable uncertainty in diagnosis, prognosis, and therapy. Clinical judgment has even been defined as the exercise of reasoning under uncertainty when caring for patients (Redelmeier, Ferris, Tu, Hux, & Schull, 2001). Such judgments are influenced by scientific evidence, personal experience, and patient factors. In the context of the current study, if risk perceptions are based on ratings of susceptibility and severity, then it is possible that high-risk perception is determined by the enhanced susceptibility of the partner. In addition, unprotected sex may be perceived as placing the partner at severe risk without the partner's knowledge and without giving them a sense of control. Such factors should be related to an increased sense of risk and to subsequent disclosure. More precisely, GPs may perceive the risk to a partner to be enhanced when protection is not used. Judgments distinguishing between homosexual and heterosexual patients are likely to be influenced by the perception of how susceptible or vulnerable the partner is to infection. For instance, a gay male may be perceived as susceptible to an elevated objective risk of HIV transmission (Kalichman, 2000). However, perceptions of risk often have a weak relationship to objective measures of risk (Slovic, Fischhoff, & Lichtenstein, 1982). Emotion may instead contribute to risk perceptions (Slovic & Peters, 2006), for instance, if a heterosexual patient's female partner is perceived generally as vulnerable in contrast to a gay male partner.

Previous research has sought to identify the key risk factors that influence decisions regarding the notification of a partner and non-risk related characteristics that may bias such decisions. Using a vignette methodology in a small sample of trainee psychologists, Palma and Iannelli examined the impact of experimentally manipulating a hypothetical client's risk behaviour on decision making. Confidentiality was more likely to be broken when hypothetical clients did not use protection during intercourse, than when protection was used (Palma & Iannelli, 2002). However, as this study did not measure risk perceptions, it is not clear if the patient's behaviour is influencing decision making

because the risk to the partner is judged to be elevated or because of other judgment biases relating to a HIV patient not using protection during intercourse (e.g., negative attitudes, stereotypes of carelessness, perceived lack of consideration).

A small number of studies have investigated attitudes towards different groups of patients with HIV and how prejudices towards various groups may impact on confidentiality decisions. For instance, psychologists were found to have less positive attitudes towards homosexual and intravenous drug user clients with HIV than heterosexual clients with HIV (Simone & Fulero, 2001). Clinical and counselling psychologists were identified as attributing greater responsibility to homosexuals in short-term relationships for self-protection from the disease (Kozlowski, Rupert, & Crawford, 1998). Together, these studies provide tentative evidence for a biasing role of patient sexuality in confidentiality decision making, though it is currently unclear if partners will be more likely to be contacted in homosexual or heterosexual relationships (McGuire, Nieri, Abbott, Sheridan, & Fisher, 1995; Herek & Capitanio, 1999).

Aims

Our central hypotheses focused on the effect of the hypothetical patient's use of protection and sexuality on GP risk perceptions and confidentiality decisions. We predicted that partners would be perceived to be at greater risk and that confidentiality would be more likely to be broken when intercourse was unprotected rather than protected. We sought to identify the extent to which risk perceptions mediate the relationship between the patient's use of protection and the likelihood the GP would contact the patient's partner. We also aimed to test if patient sexuality influenced GPs decision making and to examine the role of risk estimates in mediating between patient sexuality and the decision to contact the partner. Finally, we sought to establish if there was a link between GP characteristics (demographic factors, background characteristics, measures of experience with HIV) and breaching likelihood and to determine if differential risk perceptions explained any relationships identified.

Methods

Participants

A target sample of 700 GPs was randomly selected from the General Register of Medical Practitioners which includes the names of 2,477 registered GPs in Ireland (The Medical Council, 2003). Each GP selected was contacted with a brief postal survey which was distributed from the School of Psychology at Trinity College Dublin. GPs were provided with a letter that described the survey as a collaborative project with the Psychological Medicine Service in St James's Hospital, Dublin with a view to feeding the results into the service's best practice guidelines. The letter further detailed that research findings from St James's Hospital have been presented to the National Aids Strategy Committee as a representation of the experience, opinions, and current practice amongst practitioners in this area. Each GP was informed of the voluntary and anonymous nature of the survey request, that the survey took less than 5 minutes to complete, and that their participation would be greatly valued. Following this, participants were instructed to 'Please read the following vignette and answer the questions that follow' and to indicate their responses using the scales provided. The surveys were completed without compensation and returned by post. Data were collected from 207 participants, representing a 30% survey

return rate within a month of initial contact. The response rate was within the expected range for GP samples (e.g., Jepson, Asch, Hershey, & Ubel, 2005; McAvoy & Kaner, 1996) as GPs have reported that questionnaires regularly remain uncompleted due to work pressures and paperwork issues (Kaner, Haighton, & McAvoy, 1998).

Materials

Vignettes

Participants were asked to read one vignette and respond to a brief set of questions which followed. The vignette conditions which were created had identical content except for the manipulation of the hypothetical patient's sexual orientation (indicated by naming the partner as either 'John' or 'Paula') and use of protection during intercourse. Each randomly selected GP was linked to a number from 1 to 700 and a random number generator was then used to assign each GP to one of the four vignette conditions (i.e., homosexual patient, protection used; homosexual patient, protection not used; heterosexual patient, protection used; heterosexual patient, protection not used). The clinical vignette presented to participants in this study was adapted from Kozlowski *et al.* (1998; see Appendix). The vignette presents a situation where a male patient attends his GP having been diagnosed with HIV 2 weeks previously. The vignette required that the participant imagine that s/he had been the patient's GP for 10 years. The patient was then described as having been in either a monogamous *heterosexual relationship* or *homosexual relationship* (indicated by naming 'Dave's' partner as either 'Paula' or 'John') for 2 years. In the scenario, the patient indicates to his GP that he does not intend to tell his partner of 2 years that he is HIV positive. He also states that he intends to continue to engage in sexual intercourse with his unknowing partner, and discloses that this intercourse is either *protected* or *unprotected*.

Vignette questionnaire

Having read the single vignette, participants responded to two single-item questions. Participants were firstly asked to indicate 'What level of risk do you think Dave is placing Paula/John at?' on a five-point scale (1 = no risk, 2 = low risk, 3 = moderate risk, 4 = high risk, 5 = severe risk). Participants then responded to the statement 'If it is clear that Dave is not going to inform Paula/John, I feel that I would' by choosing the likelihood that they would maintain or break confidentiality on a five-point scale (1 = definitely maintain confidentiality, 2 = probably breach confidentiality, 3 = don't know, 4 = probably maintain confidentiality, 5 = definitely breach confidentiality).

Demographic and background information

A demographic information sheet was completed by all participants. This assessed basic demographic information about gender, years experience as a GP, and practice locale. It also asked participants to respond to the following questions: 'Have you ever had to break the confidentiality of a client for the protection of a third party' (yes/no), 'Have you ever treated a patient who was HIV positive' (yes/no), 'What level of contact have you with people who were HIV positive during your time in practice' (1 = no contact, 2 = a little contact, 3 = moderate contact, 4 = high contact, 5 = extremely high contact), and 'How informed/knowledgeable do you feel about HIV' (1 = no knowledge, 2 = a little

knowledge, 3 = moderately knowledgeable, 4 = highly knowledgeable, 5 = completely knowledgeable).

Experimental design and statistical analysis

Prior to analysis all variables were checked for normality. The study used a 2×2 completely crossed factorial design with two randomly assigned independent variables: (1) the HIV patient's risk behaviour, either protection always used or protection not used during intercourse and (2) the sexuality of the hypothetical patient with HIV, either heterosexual or homosexual. We specified a four-step multiple regression model where risk perceptions and breaching intentions were estimated as a function of a set of participant demographic and background variables (i.e., gender, practice locale, years experience as a GP, having broken confidentiality in the past; step 1), a set of measures of experience with HIV (step 2), two randomly assigned characteristics of the hypothetical HIV patient (i.e., sexual orientation and use of protection; step 3), and the interaction between patient factors (i.e., sexual orientation \times use of protection; step 4).

Next, we tested to see if the relationships between demographic and background variables and the manipulated patient variables (use of protection and sexuality) and breaching intentions were mediated by risk perceptions. Mediation was specified using the guidelines detailed in Baron and Kenny (1986) where three essential conditions must be met:

- (1) The independent variable must predict the mediator variable (e.g., HIV patient use of protection must predict the level of risk perceived).
- (2) The potential mediating variable must account for substantial variation in the dependent variable (e.g., risk perceptions must be related to breaching intentions).
- (3) Complete mediation is present if controlling for the relationship between the independent and mediating variable (condition 1) and the mediating variable and the dependent variable (condition 2), leads to an extinction of the relationship between the independent variable and the dependent variable (e.g., controlling for the association between the use of protection and risk perceptions and the link between risk perceptions and breaching likelihood, the relationship between use of protection and breaching likelihood is no longer significant).

Partial mediation is deemed to occur when the relationship between the independent and dependent variables is reduced but not to non-significance in the third condition of the analysis. Multiple regression analysis was firstly used to specify the three conditions detailed above. Both unstandardized and standardized coefficients are presented for all regression models.

Results

Characteristics of participants

Of the 207 participants, 126 (61%) were men and 76 (37%) were women and 5 participants (2%) did not report their gender, with an age range from 30 to 80 years (mean = 48.1, $SD = 9.8$). On average, participants had practised as GPs for 19.3 years ($SD = 9.8$). The majority of participants reported that they practised in an urban (61.6%) rather than a rural setting (38.4%). We compared the demographic characteristics of the

participants to a 2005 survey of a random sample of 22% of Irish GPs commissioned by the Irish Council of General Practitioners and Trinity College Dublin in order to establish the characteristics of Irish GPs (O'Dowd, O'Kelly, & O'Kelly, 2006). This survey had an 87% response rate and found that the median age group of GPs was between 50 and 54, 70% were men and 30% women, and 42.5% were classified as working in an urban area, 21.6% as working in a rural area, and 35.9% endorsed a mixed area category. Using the same age ranges cited in O'Dowd *et al.* (2006), we found that the median age of our sample was between 45 and 49. Taken together, when contrasted with the population of GPs in Ireland the participants that responded to the current survey appear somewhat more likely to be female, younger, and potentially from rural areas.

Approximately, a fifth of participants (19.6%) reported having broken confidentiality to protect a third party. Seventy-four per cent of participants had treated a patient who was HIV positive. On average, participants reported having only a little contact with patients who were HIV positive. On a scale of 1 (no contact) to 5 (extremely high contact), the median rating was 2 and the mean rating was 2.21 ($SD = 0.93$). Participants reported feeling moderately knowledgeable about HIV. On a scale of 1 (no knowledge) to 5 (extremely high knowledge), the median rating was 3 and the mean rating was 2.73 ($SD = 0.6$).

Factors predicting likelihood of breaking confidentiality

On average, considering responses across all conditions, participants indicated a tendency towards breaking rather than maintaining confidentiality, scoring a median of 4 and mean of 3.5 ($SD = 1.04$) on the five-point scale used. There was a substantial degree of heterogeneity in intentions to break or maintain confidentiality with 15% of participants indicating they would 'definitely breach confidentiality', 42% that they would 'probably breach confidentiality', 26% that they 'don't know', whilst 12% indicated they would 'probably maintain confidentiality', and 5% would 'definitely maintain confidentiality'. Higher perceptions of risk to the partner were closely related to a greater likelihood of breaking confidentiality ($r = .31, p < .005$) suggesting that safety is closely linked to GP decision making.

An analysis of the association between GP background factors, patient characteristics, and the likelihood of breaking confidentiality is presented in Table 1. This analysis found that participants who had practised longer as GPs indicated they were more likely to maintain confidentiality ($p < .005$). Those who had broken confidentiality in the past for any reason were more likely to do so in reaction to the presented vignette ($p < .01$), as shown in Table 1. Having more experience in treating patients with HIV or a greater level of knowledge or education in the area of HIV treatment did not influence decision making. A two-step cluster analysis of GP background factors (gender, years as a GP, urban/rural area of practice, having broken confidentiality in the past, having treated people with HIV, and contact with and knowledge of HIV) identified five distinct clusters. One cluster predicted a greater likelihood of breaking confidentiality and this cluster was composed solely of all participants who had broken confidentiality in the past (19.6% of the sample). This analysis suggests that this group are distinct and may merit further investigation.

The manipulated patient characteristics had a substantial effect on breaching intentions. As expected, GPs were more likely to indicate they would break confidentiality when protection was not used ($p < .001$), as shown in Table 1 and illustrated in Figure 1a. We found that GPs were more likely to breach confidentiality to protect the partner

Table 1. Summary of four-step linear regression analysis of the ability of demographic, background, GP experience, and patient characteristics to predict the likelihood of breaking confidentiality

Variable	Likelihood of breaking confidentiality			
	B	SE B	β	p value
<i>Step 1</i>				
Years experience	-0.03	.01	-0.25	<.005
Female ^a	-0.29	.17	-0.14	.09
Rural ^b	-0.18	.17	-0.08	.25
Broken confidentiality ^c	0.54	.19	0.21	<.01
<i>Step 2</i>				
Treated HIV	0.07	.22	0.03	.76
Contact with HIV	-0.12	.11	-0.11	.24
Knowledge of HIV	0.08	.14	0.05	.57
<i>Step 3</i>				
Patient is heterosexual ^d	0.44	.15	0.21	<.005
Protection not used ^e	0.58	.14	0.28	<.001
<i>Step 4</i>				
Patient is heterosexual \times protection not used	0.16	.30	0.06	.60

Note. SE, standard error.

^a Base category for analysis is 'male'.

^b Base category is 'urban setting'.

^c Base category is 'never broke confidentiality'.

^d Base category is 'homosexual'.

^e Base category is 'protection used'.

in a heterosexual as opposed to a homosexual relationship ($p < .005$), as illustrated in Figure 1b. There was no interaction between the patient's use of protection and sexuality in predicting breaching decisions.

Risk perceptions as a mediator between physician and patient characteristics and breaching likelihood

Participants believed that the patient with HIV posed a high level of risk to his partner as indicated by a median score of 4 and mean of 3.99 ($SD = 0.83$). The linear regression model exploring relationships of the GP characteristics and background factors that predicted decision making showed that neither the length of time participants had worked as a GP ($p < .61$) nor whether or not they had broken confidentiality in the past ($p < .56$) were related to risk perceptions. This indicated that risk perceptions did not mediate the association between GP demographic and background characteristics and GP decision making. Whether the relationship was homosexual or heterosexual did not influence the perceived risk to the partner ($p = .23$). As patient sexuality fails to fulfil the initial criteria for mediation (the independent variable predicting the mediator) it was not considered for later steps in the analyses.

The patient's use of protection was strongly predictive of risk perceptions ($p < .001$), as shown in Table 2. The relationship between the patient's use of protection and GP risk perceptions provided evidence for condition 1 of the mediation analysis. Risk perceptions also predicted breaching intentions ($b = 0.381$, $SE = .085$, $\beta = 0.31$, $p <$

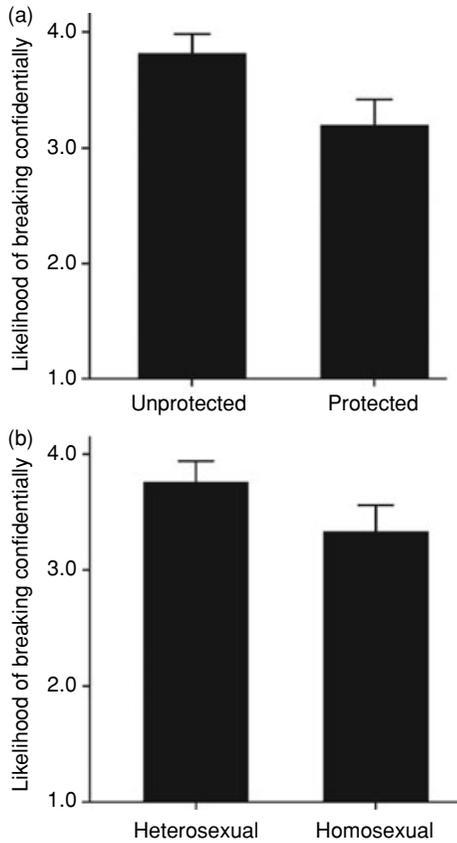


Figure 1. Likelihood that confidentiality will be broken as a function of (a) patient use of protection during intercourse and (b) patient sexual orientation.

.001) satisfying the second condition for mediation. This relationship was robust to the inclusion of demographic, background, and experience-related factors. When protection use was entered into the model alongside risk perceptions, the relationship between the patients use of protection and likelihood of breaking confidentiality was reduced but not completely attenuated ($b = 0.563$, $SE = .147$, $\beta = 0.27$, $p < .001$, to $b = 0.376$, $SE = .152$, $\beta = 0.18$, $p < .05$), as shown in Table 3. A Sobel test identified that the use of protection exerted a significant indirect effect on breaching likelihood ratings by influencing risk perceptions, $Z = 2.81$, $p < .005$. A bootstrap mediation analysis replicated the finding that risk perceptions are likely to be an important mediator, $Z = 2.56$, $p < .01$ (Preacher & Hayes, 2008). Together, this pattern of results demonstrates that risk perceptions partially mediate the relationship between the patient's use of protection and breaching intentions.

Discussion

We set out to elucidate the role of physician and HIV patient characteristics in confidentiality decision making. Upon discovering that a patient with HIV is placing a sexual partner in danger of infection, the physician needs to choose between seemingly

Table 2. Summary of two-step linear regression analysis of the ability of patient use of protection to predict risk perceptions

Variable	Risk to partner			
	B	SE B	β	p value
<i>Step 1</i>				
Protection not used ^a	0.61	.12	0.36	<.001
<i>Step 2</i>				
Protection not used ^a	0.62	.12	0.37	<.001
Years experience	0.001	.007	0.017	.82
Female ^b	0.17	.14	0.09	.24
Rural ^c	0.07	.13	0.04	.57
Broken confidentiality ^d	-0.12	.15	-0.06	.42
Treated HIV	-0.31	.17	-0.15	.08
Contact with HIV	-0.12	.08	-0.13	.14
Knowledge of HIV	0.06	.11	0.04	.62

Note. SE, standard error.

^a Base category is 'protection used'.

^b Base category for analysis is 'male'.

^c Base category is 'urban setting'.

^d Base category is 'never broke confidentiality'.

opposing duties: to protect the partner and to maintain the confidentiality of the patient. In this study, we hypothesized that risk behaviours and biasing factors would have a substantial influence on decision making. We replicated the finding that the decision to breach confidentiality is sensitive to whether or not a patient is taking measures to protect their partner (Palma & Iannelli, 2002).

As expected, the risk to the HIV patient's partner was estimated to be greater when the patient did not use protection than when protection was used. Mediation analyses revealed that risk perceptions partially explained the relationship between the experimentally manipulated use of protection and the likelihood confidentiality would

Table 3. Summary of regression analysis of the ability of risk perceptions to predict the likelihood of breaking confidentiality adjusting for the patient's use of protection

Variable	Likelihood of breaking confidentiality			
	B	SE B	β	p value
<i>Step 1^a</i>				
Risk perception	0.381	.085	0.311	<.005
<i>Step 2^a</i>				
Risk perception	0.304	.090	0.247	<.005
Protection not used ^b	0.376	.152	0.180	<.05

Note. SE, standard error.

^a Analysis adjusted for years experience, gender, practice locale, having broken confidentiality in the past, and experience with HIV.

^b Base category is 'protection used'.

be broken. Because mediation was partial, this finding demonstrates that non-risk factors (e.g., GP's attitudes towards the patients use of protection) are likely to have influenced decision making.

The simple manipulation of changing the sexuality of the hypothetical patient had a substantial effect on breaching intentions. Kozlowski and colleagues have found that psychotherapists feel a greater responsibility to protect a partner in danger of contracting HIV if the relationship is heterosexual rather than homosexual (Kozlowski *et al.*, 1998). We extended this finding by demonstrating that GPs were more likely to breach confidentiality when the relationship is heterosexual as opposed to homosexual. More remarkably, these effects were unrelated to the level of risk the GP believed the partner to be placed in.

It may be the case that GPs assume that homosexuals should be more aware of the risk of HIV than heterosexuals and therefore assume a greater responsibility for self-protection. It is also possible that GPs feel a greater responsibility to protect a female rather than a male partner. Incorporating vignettes that are gender balanced into future studies (e.g., include a female HIV patient and male partner) and that include lesbian relationships will help determine if the tendency to contact the heterosexual female partner reflects sexual orientation or patient-partner gender differences.

Breaching confidentiality has previously been found to be unacceptable to a small group of French physicians (Guedj *et al.*, 2006). A second study, with a larger random sample of South-Eastern French physicians, showed that under a quarter of GPs agreed that they would disclose a HIV patient's diagnosis to a sexual partner without the patient's consent (Moatti *et al.*, 1995). In contrast, the majority of Irish GPs in the present study were willing to sacrifice the confidentiality rights of the patient with HIV to contact an endangered partner.

It is possible that this trend may reflect differences in wording of questions, content of scenarios, or sampling. However, in France, medical codes favour absolute confidentiality, without exemption for the protection of others. In Ireland, there are special cases, including HIV infection, where it is deemed permissible by medical ethical guidelines to contact an at risk third party without the patient's consent. The existence of special cases may partially explain why the majority of GPs indicated they would contact the partner in the presented scenario. The significant reliance on the judgment of the individual GP in Ireland may be one cause of the large degree of heterogeneity in decision making that was observed in the current study.

We attempted to identify background and demographic characteristics that may systematically influence GPs risk estimates and the likelihood confidentiality would be broken. We found that the physicians who had broken confidentiality in the past (19.6%) were more likely than other participants to breach confidentiality in the presented hypothetical scenario. An additional cluster analysis of GP background factors found that having broken confidentiality in the past was a distinct characteristic that appeared to distinguish GPs with an elevated likelihood of breaking confidentiality. These findings fit well with the psychology literature on the relationship between past and future acts. In this case, past behaviour can contribute to behavioural intentions which mediate between past and future behaviour (Ouellette & Wood, 1998).

Knowledge, contact, and experience in the area of HIV treatment did not influence confidentiality decision making. GPs who had practised medicine longer were more likely to maintain confidentiality than GPs with fewer years of clinical experience. Duration of practice as a GP was unrelated to the risk the partner was thought to be placed at by the patient. It may be the case that those physicians who have been recently educated about

special cases, where third parties can be contacted without patient consent, may view breaching confidentiality to be a legitimate option. GPs with more experience may think of alternative strategies for convincing the patient to take precautions or to inform his partner. For example, the GP may educate the patient in the risks posed to the partner, advise on how best to ensure the virus is not passed on, and help the patient to come to terms with his or her HIV status and fears of rejection or disapproval (Kozlowski *et al.*, 1998).

The current study is further limited in a number of ways. The sample, whilst drawn from a random sample of a national register of GPs, may include a disproportionate number of GPs with an interest in HIV and/or issues of confidentiality. The use of hypothetical vignettes represents a parsimonious and easily administered method of assessing decision making but is limited in that it is difficult to determine if vignette responses reflect clinical decision making with real cases.

A substantial limitation of the study is that we could not draw inferences as to what biases mediate the relationship between GP characteristics or patient sexuality and the likelihood confidentiality would be broken. This study aimed solely to specify the role of risk perceptions and to identify basic factors that contributed to decision making independently of risk estimates. Future research is needed to delineate the psychological processes that explain the relationship between the factors we have identified as important (e.g., years experience as a GP, having broken confidentiality in the past, patient sexuality) and the decision to contact a HIV patient's partner.

Conclusion

Overall, the results of this study indicate that the perceived risk to the HIV-infected patient's partner is a central concern for GPs when making confidentiality decisions. When a HIV patient did not use protection, the GP was more likely to contact the partner and this was partially because GPs perceived the risk to the partner to be higher. However, whilst male to male intercourse has been associated with a higher rate of HIV transmission than male to female intercourse, GPs did not perceive the risk to the partner to be different, and the partner was more likely to be contacted when the relationship was heterosexual rather than homosexual (Palma & Iannelli, 2002). This distinction was not based on risk perceptions and may reflect biasing factors in decision making. Having broken confidentiality in the past, or having few years experience as a GP, was unrelated to risk perceptions yet predicted an increased likelihood of breaching confidentiality. We can therefore conclude that the GP's hypothetical decision whether to breach confidentiality to protect a male HIV patient's partner appears to be partially contingent on risk perceptions but also sensitive to situational factors, past behaviour, and personal characteristics.

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References

- Baron, R. M., & Kenny, D. A. (1986). The moderator-mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology*, 51, 1173-1182. doi:10.1037/0022-3514.51.6.1173

- Bayer, R. (1992). HIV prevention and the two faces of partner notification. *Health Law and Ethics*, 82, 1158–1164.
- Burns, F. M., Johnson, A. M., Nazroo, J., Ainsworth, J., Anderson, J., Fakoya, A., . . . SONHIA Collaboration Group (2008). Missed opportunities for earlier HIV diagnosis within primary and secondary healthcare settings in the UK. *AIDS*, 22, 115–122. doi:10.1097/QAD.0b013e3282f1d4b6
- Chenneville, T. (2000). HIV, confidentiality, and duty to protect: A decision-making model. *Professional Psychology: Research and Practice*, 31, 661–670. doi:10.1037/0735-7028.31.6.661
- General Medical Council (April, 2004). *Confidentiality: Protecting and providing information*. Retrieved from <http://www.gmc-uk.org/guidance/current/library/confidentiality.asp>. #Disclosing information about patients.
- Guedj, M., Munoz Sastre, M. T., Mullet, E., & Sorum, P. C. (2006). Under what conditions is the breaking of confidentiality acceptable to lay people and health professionals? *Journal of Medical Ethics*, 32, 414–419. doi:10.1136/jme.2005.012195
- Hammond, K. R. (1996). *Human judgment and social policy: Irreducible uncertainty, inevitable error and unavoidable injustice*. New York: Oxford University Press.
- Herek, G. M., & Capitanio, J. P. (1999). AIDS stigma and sexual prejudice. *American Behavioral Scientist*, 42, 1130–1147. doi:10.1177/0002764299042007006
- Hook, M. K., & Cleveland, J. L. (1999). To tell or not to tell: Breaching confidentiality with clients with HIV and AIDS. *Ethics and Behavior*, 9, 365–381. doi:10.1207/s15327019eb0904_6
- Jepson, C., Asch, D. A., Hershey, J. C., & Ubel, P. A. (2005). In a mailed physician survey, questionnaire length had a threshold effect on response rate. *Journal of Clinical Epidemiology*, 58, 103–105. doi:10.1016/j.jclinepi.2004.06.004
- Jones, A. M. (November, 2001). *Confidentiality – ethical considerations in HIV transmission: Guidelines for professionals*. Dublin: Department of Health and Children.
- Kalichman, S. C. (2000). HIV transmission risk behaviors of men and women living with HIV-AIDS: Prevalence, predictors, and emerging clinical interventions. *Clinical Psychology: Science and Practice*, 7, 32–47. doi:10.1093/clipsy/7.1.32
- Kaner, E. F. S., Haighton, C. A., & McAvoy, B. R. (1998). So much post, so busy with practice – so, no time!: A telephone survey of general practitioners' reasons for not participating in postal questionnaire surveys. *British Journal of General Practice*, 48, 1067–1069.
- Kozlowski, N. F., Rupert, P. A., & Crawford, I. (1998). Psychotherapy with HIV-infected clients: Factors influencing notification of third parties. *Psychotherapy*, 35, 105–115. doi:10.1037/h0087725
- Leventhal, H., Meyer, D., & Nerenz, D. (1980). The common sense representation of illness danger. In S. Rachman (Ed.), *Medical psychology*, (Vol. 2, pp. 7–30). New York: Pergamon.
- McAvoy, B. R., & Kaner, E. F. S. (1996). General practice postal surveys: A questionnaire too far? *British Medical Journal*, 313, 732–733.
- McGuire, J., Nieri, D., Abbott, D., Sheridan, K., & Fisher, R. (1995). Do Tarasoff principles apply in AIDS-related psychotherapy? Ethical decision making and the role of therapist homophobia and perceived client dangerousness. *Professional Psychology: Research and Practice*, 26, 608–611. doi:10.1037/0735-7028.26.6.608
- Melchert, T. P., & Patterson, M. M. (1999). Duty to warn and interventions with HIV-positive clients. *Professional Psychology: Research and Practice*, 30, 180–186. doi:10.1037/0735-7028.30.2.180
- Moatti, J. P., Souville, M., Obadia, Y., Morina, M., Sebbah, R., Gamby, T., . . . Gastaut, J. A. (1995). Ethical dilemma in care for HIV infection among French general practitioners. *Health Policy*, 31, 197–210. doi:10.1016/0168-8510(94)00698-E
- O'Dowd, T. C., O'Kelly, M., & O'Kelly, F. (2006). *Structure of general practice in Ireland: 1982–2005*. Dublin: ICGP 62. Retrieved from http://www.medicine.tcd.ie/public_health_primary_careassets/pdf/reports/GP_Structure.pdf

- Ouellette, J. A., & Wood, W. (1998). Habit and intention in everyday life: The multiple processes by which past behavior predicts future behavior. *Psychological Bulletin*, *124*, 54-74. doi:10.1037/0033-2909.124.1.54
- Paauw, D. S., & O'Neill, J. F. (1990). Human immunodeficiency virus and the primary care physician. *Journal of Family Practice*, *31*, 646-650.
- Palma, T. V., & Iannelli, R. J. (2002). Therapeutic reactivity to confidentiality with HIV positive clients: Bias or epidemiology?. *Ethics and Behavior*, *12*, 353-370. doi:10.1207/S15327019EB1204_03
- Petchey, R., Farnsworth, B., & Williams, J. (2000). The last resort would be to go to the GP: Understanding the perceptions and use of general practitioner services among people with HIV/AIDS. *Social Science and Medicine*, *50*, 233-245. doi:10.1016/S0277-9536(99)00278-6
- Preacher, K. J., & Hayes, A. F. (2008). Asymptotic and resampling procedures for assessing and comparing indirect effects in multiple mediator models. *Behavior Research Methods*, *40*, 879-891. doi:10.3758/BRM.40.3.879
- Quinn, T. C., Wawer, M. J., Sewankambo, N., Serwadda, D., Li, C., Wabwire-Mangen, F., . . . Gray, R. H. (2000). Viral load and heterosexual transmission of human immunodeficiency virus Type 1. *New England Journal of Medicine*, *342*, 921-929. doi:10.1056/NEJM200003303421303
- Redelmeier, D. A., Ferris, L. E., Tu, J. V., Hux, J. E., & Schull, M. J. (2001). Problems for clinical judgement: Introducing cognitive psychology as one more basic science. *Canadian Medical Association Journal*, *164*, 358-360.
- Rogers, R. W. (1983). Cognitive and physiological processes in fear appeals and attitude change: A revised theory of protection motivation. In B. L. Cacioppo & L. L. Petty (Eds.), *Social psychophysiology: A sourcebook* (pp. 153-176). London: Guildford.
- Rosenstock, E. M., Strecher, V. J., & Becker, M. H. (1988). Social learning theory and the health belief model. *Health Education Quarterly*, *15*, 175-183.
- Schwarzer, R., & Renner, B. (2000). Social-cognitive predictors of health behavior: Action self-efficacy and coping self-efficacy. *Health Psychology*, *19*, 487-495. doi:10.1037/0278-6133.19.5.487
- Simone, S. J., & Fulero, S. M. (2001). Psychologists' perceptions of their duty to protect uninformed sex partners of HIV-positive clients. *Behavioral Science and the Law*, *19*, 423-436. doi:10.1002/bsl.450
- Slovic, P., Fischhoff, B., & Lichtenstein, S. (1982). Facts versus fears: Understanding perceived risk. In D. Kahneman, P. Slovic, & A. Tversky (Eds.), *Judgement under uncertainty: Heuristics and biases* (pp. 463-489). Cambridge: Cambridge University Press.
- Slovic, P., & Peters, E. (2006). Risk perception and affect. *Current Directions in Psychological Science*, *15*, 322-325. doi:10.1111/j.1467-8721.2006.00461.x
- Sutton, S. (1999). Perception of health risks: A selective review of the psychological literature. *Risk Management: An International Journal*, *1*, 51-59.
- The Medical Council (June, 2003). *General register of medical practitioners*. Dublin: Author.
- The Medical Council (March, 2004). *Guide to ethical conduct and behaviour* (6th ed.). Dublin: Author.
- Totten, G., Lamb, D. H., & Reeder, G. D. (1990). Tamasoff and confidentiality in AIDS-related psychotherapy. *Professional Psychology: Research and Practice*, *21*, 155-160. doi:10.1037/0735-7028.21.3.155
- Weinstein, N. D. (1989). Optimistic biases about personal risks. *Science*, *246*, 1232-1233. doi:10.1126/science.2686031
- Weinstein, N. D. (2000). Perceived probability, perceived severity, and health-protective behavior. *Health Psychology*, *19*, 65-74. doi:10.1037/0278-6133.19.1.65
- Whetten-Goldstein, K., Nguyen, T. Q., & Sugarman, J. (2001). So much for keeping secrets: The importance of considering patients' perspectives on maintaining confidentiality. *AIDS Care*, *13*, 457-466. doi:10.1080/09540120120057987
- Witte, K. (1992). Putting the fear back into fear appeals: The extended parallel process model. *Communication Monographs*, *59*, 329-349. doi:10.1080/03637759209376276

Witte, K. (1998). Fear as motivator, fear as inhibitor: Using the extended parallel process model to explain fear appeal successes and failures. In P. A. Andersen & L. K. Guerrero (Eds.), *Handbook of Communication and Emotion: Research, Theory, Applications and Contexts* (pp. 423–449). San Diego, CA: Academic Press.

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Appendix

Four hypothetical case vignettes were generated through the manipulation of the patients risk behaviour and sexual orientation (italics indicate manipulated sections)

Dave is a 31-year-old male and you have been his GP for 10 years. He has been in a monogamous, committed relationship with *Paula/John*, for the last 2 years. Dave comes to an appointment one day extremely shaken. He reports that he was diagnosed HIV positive 2 weeks prior to the appointment, but has been too upset to disclose this to you until now. He is almost certain that he contracted HIV during a period of time when he was sexually promiscuous before this relationship began. He has decided that he will not tell *Paula/John* that he is infected with HIV. He has also stated that he will continue to engage in *unprotected/protected* sexual intercourse with *her/him*, as he does not want *her/him* to become suspicious of any change in his behaviour. You try to persuade him to inform *Paula/John* of his HIV status, but he insists that it is more important that someone helps him during this difficult time than anything else.