

## ORIGINAL ARTICLE

## Physicians' opinions about partner notification methods: case reporting, patient referral, and provider referral

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**Background:** The United States has relied upon partner notification strategies to help break the chain of infection and re-infection for sexually transmitted diseases (STD). Physicians are a vital link in the system of STD control, but little is known of physician opinions about partner notification strategies.

**Methods:** We collected opinions about partner notification from a national probability sample of physicians in specialties diagnosing STDs. Physicians responded to 17 questions about three relevant forms of STD partner notification: patient based referral, provider based referral, and case reporting.

**Results:** Exploratory factor analyses showed that responses for each form of partner notification could be grouped into four categories: perceived practice norms, infection control, patient relationships, and time/money. Multivariate analyses of the factors showed that physicians endorsed patient based referral most favourably and provider based referral least favourably.

**Conclusion:** Physicians' opinions about partner notification strategies appear to reflect objective reality in some areas, but not in others. Strategies that improve the fit between physicians' opinions and effective notification are needed: some are discussed here.

In the United States, many sexually transmitted diseases (STDs) continue to represent a significant disease burden and public health challenge.<sup>1</sup> In part, the problem is sustained because many infected people remain untreated and even unaware of their infections. Partner notification is a public health strategy that, by successfully notifying partners of people diagnosed with STDs that they have been exposed to an infectious disease and encouraging them to seek medical evaluation, disrupts the cycle of infection and re-infection. Techniques aimed at convincing the infected person to notify sex partners of their exposure fall under the rubric of "patient referral." Mechanisms through which a professional (usually a disease intervention specialist: DIS) interviews the infected person to elicit names of sex partners and then notifies those partners are called "provider referral." In both instances, referral means that someone (a provider, an infected person) is referring sex partners to some place to get evaluated and treated. Finally, case reporting by physicians to health departments can set in motion either form of partner notification.

There is substantial variance among studies of the effectiveness of partner notification strategies, but meta-analytical studies suggest that provider referral in the public sector identifies the most infected individuals.<sup>2,3</sup> However, STDs are not treated exclusively, or even predominantly, in the public sector.<sup>4</sup> Consequently, more of the onus for partner notification falls upon the private sector than is generally reflected in the research literature. By uncovering aspects of partner notification that private, as well as public, physicians consider barriers and by comparing their responses across the three different partner notification strategies, we may uncover reasons why deficiencies exist and inform interventions aiming to increase the usefulness of partner notification techniques.

## METHODS

### Participants and procedure

We sampled 7300 physicians in five specialties (obstetrics/gynaecology, internal medicine, general/family practice, emergency medicine, paediatrics) from the American

Medical Association's Physician's Master File. Physicians in these five specialties treat 85% of all STDs in the United States.<sup>5,6</sup> Eligibility criteria were that the physicians spend at least 50% of their time in direct patient care and that they saw patients between the ages of 13 and 60 years. Surveys, cover letters, and \$15.00 were delivered via Federal Express, with reminder postcards following, if needed. The final response rate was 70.2% (4223 surveys).

### Materials

We solicited 17 opinions about types of partner notification, with content for those questions drawn from focus group interviews with physicians. Responses to each item, assessed on five point Likert scales (1 = "strongly disagree," 2 = "disagree," 3 = "neutral," 4 = "agree," 5 = "strongly agree"), follow from each of three stems, representing case reporting, patient referral, and provider referral. The full stems were:

- Reporting patients to the health department for follow up... (case reporting, CR)
- Encouraging your STD patients to contact their partner(s) themselves... (patient referral, PaR)
- Collecting the names of partner(s) of STD patients and contacting them directly... (provider referral, PrR)

For example, a physician responding to the first item in table 1 with the first stem indicated some level of agreement with the full statement: "Reporting patients to the Health Department for follow up complies with the standard of care in my clinic."

### Analysis plan

We aimed to (1) describe the range of physician opinions with respect to partner notification practices, (2) present a parsimonious account of such variables, and (3) outline how endorsement of opinions might vary with the type of partner notification practice. Item means and standard deviations sufficed for the first aim. For the second, we turned to exploratory factor analysis (EFA) to help us group related opinions into a smaller number of factors, each of which

**Table 1** Means and standard deviations for item responses by type of notification

	Case reporting		Patient referral		Provider referral	
	Mean	SD	Mean	SD	Mean	SD
(1) Complies with clinic standard of care	3.61	0.9	3.77	0.9	2.74	0.9
(2) What most of my colleagues do	3.25	1.0	3.47	0.8	2.46	0.9
(3) Expected by my health department	3.69	0.9	3.56	0.8	2.79	1.0
(4) Valued in my clinic setting	3.37	1.0	3.81	0.8	2.81	0.9
(5) I don't feel comfortable	2.54	1.2	2.08	0.9	3.48	1.1
(6) I don't feel well trained	2.51	1.1	2.28	0.9	3.09	1.0
(7) Causes my patients not to return	2.67	1.0	2.29	0.8	3.12	1.0
(8) Gets the patient upset with me	3.01	1.0	2.29	0.8	3.38	1.0
(9) Not my responsibility	2.27	1.0	1.97	0.8	3.14	1.0
(10) Help prevent spread of STD	4.16	0.9	4.08	0.8	3.66	1.0
(11) Fulfil my "duty to warn"	3.81	0.9	3.67	0.9	3.40	1.0
(12) Protects my patients from re-infection	3.58	1.1	3.66	1.0	3.42	1.0
(13) Opportunity for prevention education	4.01	0.8	4.13	0.7	3.72	0.8
(14) Helps patients change their risk behaviour	3.18	1.1	3.42	1.0	3.11	1.0
(15) Take too much of my time	2.82	1.1	2.12	0.9	3.73	1.0
(16) Take too much staff time	2.80	1.2	2.18	0.9	3.72	1.0
(17) An activity I won't get paid for	3.57	1.1	3.28	1.1	3.72	1.0

N varies between 3844 and 4006, depending on skipped responses. Response scale: 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = strongly agree.

comprised several items. Interpretable factors comprising multiple items have the advantage of conveying clear meaning with a single score. To discern whether physicians differed in how they endorsed partner notification strategies we ran a repeated measures multivariate analysis of variance (MANOVA) with univariate follow up tests, using the different types of partner notification (case reporting, patient referral, provider referral) as a repeated measures grouping variable, and physician scores on scales derived from the EFA as the outcome variables. Where relevant items were recoded such that agreement implies endorsement.

## RESULTS

### Sample

Demographically, the physician sample is representative of physicians in the United States. Physicians' mean age was 46.2 years (SD 10.3), with 2953 (70.9%) male respondents and 1214 (29.1%) female respondents. Physicians had been practising for a mean of 17.8 years (SD 10.5), spending an average of 42.7 hours per week (SD 16.7) in direct patient care. Most physicians saw a variety of patients, but estimated the majority of patients (62.6%) were female. Approximately two out of three physicians were in a primary care office, with most of the remainder working in a hospital environment (including emergency rooms, urgent care hospital clinics, and ambulatory care facilities). Most physicians (86.7%) have diagnosed at least one STD in the previous year, and most (87.1–88.1%) indicated they diagnosed each of the most common bacterial STDs, chlamydial infections, and gonorrhoea. Further information is available in the paper by St Lawrence *et al.*<sup>7</sup>

### Physician opinions concerning partner notification strategies

Physician responses to the 17 individual questions are contained within table 1. The smallest mean difference between any two comparisons is 0.07 points (CR versus PrR on question 14), and this difference is significant at  $p < 0.001$ . This significance level is maintained in the face of a Bonferroni adjustment for the 42 possible comparisons so, in short, scores on the variables all differ statistically from one another.

Depending on the STD, 38.5–49.6% of physicians always reported patient names to health departments. The corresponding figures for "usually" were 11.2–11.9%, with 28.3–36.3% never reporting cases. Most (80.8–83.8%) always asked their patients to notify their partners (usually = 12.5–14.4%; never = 1.4–1.5%). However, only 4.1–4.4% of physicians always practised provider referral (usually = 3.9–4.3%; never = 71.6–71.8%).

Over half the physicians (57.3%) agreed or strongly agreed that case reporting to health departments complied with their clinics' standards of care and that doing so fulfilled any duty to warn (70.5%). Physicians also viewed case reporting as a relatively effective means of controlling STD, with 81.5% agreeing or strongly agreeing that case reporting presented an opportunity for prevention education, and 40.7% agreeing or strongly agreeing that case reporting helped patients change their risk behaviours (versus 27.6% disagreeing or strongly disagreeing) and helped prevent the spread of STD (82.7%). Physicians were neutral about whether case reporting consumed too much of their time ( $M = 2.82$ ) or their staffs' time ( $M = 2.80$ ).

Physicians were about as sanguine about the effects of patient referral. More physicians (70.1%) agreed or strongly agreed that patient referral complied with their clinics' standards of care, although somewhat fewer (67.4%) considered that doing so fulfilled a duty to warn. Physicians also viewed patient referral as about as effective as case reporting at controlling STD. Similar percentages of respondents agreed or strongly agreed that patient referral presented an opportunity for prevention education (89.7%), helped patients change their risk behaviours (51.9%), and helped prevent the spread of STDs (83.5%). Physicians, on the whole, disagreed with the idea that patient referral would be too time consuming for them ( $M = 2.12$ ) or their staff ( $M = 2.18$ ).

More physicians disagreed (41.4%) than agreed (18.9%) that provider referral met their clinics' standards of care, although a majority (51.0% agreed/strongly agreed) felt that provider referral fulfilled a duty to warn. Although physicians agreed that provider referral was of some benefit in controlling STDs, fewer physicians than in either of the above two conditions considered provider referral an opportunity for prevention education (69.7% agreed/strongly

agreed), a help to changing patient risk behaviour (37.7%), or a help to preventing the spread of STDs (66.7%). Moreover, physicians were much more likely to feel that provider referral would be overly time consuming for both themselves ( $M = 3.73$ ) and their staff ( $M = 3.72$ ).

**Exploratory factor analyses (EFA)**

We subjected the 17 items to three principal components analyses (one for each PN strategy), which yielded four factors (components) for each (table 2). We then rotated the factors, using the varimax procedure to improve interpretability.

The four factors together accounted for 62% of the total variance among the 17 items for case reporting (CR), 57.5% for patient referral (PaR), and 64.4% of the variance for provider referral (PrR). These percentages are similar enough to one another to suggest that results represent physicians' responses to the 17 items equivalently for each type of partner notification strategy. Factor I represented physician norms for good service ("norms"), factor II, the importance of maintaining good relations with patients ("patient relations"), factor III, the importance of STD control ("infection control"), and factor IV, the effects of time and money ("time/money").

Item factor correlations (that is, factor loadings) are contained in table 2, with the largest loading for each item marked in bold. On almost every occasion, each item loaded onto the same factor for each of the three forms of referral. Of the 51 conceptually important loadings listed in table 2 (those in bold), only five loaded naturally onto different factors. The only two anomalous loadings of any magnitude were time concerns (both physician and staff time), which, for PaR, loaded more strongly onto factor II than for factor IV. The alternative to using the PaR loadings for factor IV, however, is to use the loadings of both CR and PrR for factor II, which is more empirically problematic and conceptually less interpretable.

**Scaling factors and differences among physicians by type of notification strategy**

To compare physician attitudes formally on each factor by type of strategy, we created scales from each factor, summing items loading most strongly onto each factor into a single score (for example, factor I became a four item scale). Because items loaded onto the same factors for each type of strategy, we scaled the same items for each factor and thus made direct comparisons in a MANOVA framework. All but one scale had acceptable reliability according to conventional criteria. The  $\alpha$  of 0.58 for PaR factor IV, (table 2) was lower, but we included factor IV in subsequent analyses.

In table 3, high means represent more favourable opinions about the scale content. A repeated measures MANOVA yielded a significant multivariate main effect for type of question,  $F(2, 3767) = 941.83, p < 0.001, R = 0.52$ . This main effect showed that physicians had different opinions on the four scales depending on the type of partner notification strategy. Subsequent univariate ANOVA testing for differences by type of question for each scale individually revealed significant differences by type of partner notification strategy for each scale (see table 3). Furthermore, contrast testing among the groups revealed significant differences at each level of each outcome variable, all at  $p < 0.001$  (a Bonferroni correction yields a criterion p value of 0.004). Provider referral was uniformly rated least favourably and patient referral most favourably by physicians for each of the four factors.

**DISCUSSION**

Physician opinions about partner notification strategies are reducible to four areas, regardless of the particular notification strategy. Of the strategies, physicians think least of provider referral and think most of patient referral. In the remainder of this discussion, we assess these findings in terms of how they fit actual practice conditions (insofar as there are objective conditions), and then discuss how they might inform changes in partner notification practices.

**Table 2** Factors describing physician opinions to partner notification

	Factor I			Factor II			Factor III			Factor IV		
	"Norms"			"Patient relations"			"Infection control"			"Time/money"		
	CR	PaR	PrR	CR	PaR	PrR	CR	PaR	PrR	CR	PaR	PrR
% of variance	18.1	13.7	17.1	17.6	21.6	15.3	15.6	15.4	17.0	10.7	6.8	14.1
Reliability ( $\alpha$ )	0.86	0.74	0.83	0.83	0.79	0.79	0.75	0.74	0.80	0.67	0.58	0.82
Complies with clinic standard of care	<b>0.794</b>	<b>0.571</b>	<b>0.736</b>	-0.206	-0.135	-0.124	0.279	0.391	0.259	-0.060	-0.218	-0.141
What most of my colleagues do	<b>0.785</b>	<b>0.736</b>	<b>0.786</b>	-0.187	-0.189	-0.140	0.185	0.100	0.010	-0.109	-0.015	-0.135
Expected by my health department	<b>0.792</b>	<b>0.743</b>	<b>0.775</b>	-0.170	-0.096	-0.038	0.169	0.096	-0.083	-0.037	0.164	-0.093
Valued in my clinic setting	<b>0.646</b>	<b>0.673</b>	<b>0.777</b>	-0.229	-0.295	-0.176	0.343	0.320	0.250	-0.145	-0.001	-0.146
I don't feel comfortable	-0.273	-0.216	-0.256	<b>0.772</b>	<b>0.671</b>	<b>0.690</b>	-0.082	-0.070	-0.071	0.124	0.171	0.257
I don't feel well trained	-0.197	-0.208	-0.189	<b>0.717</b>	<b>0.592</b>	<b>0.576</b>	-0.012	-0.032	0.010	0.112	0.298	0.194
Causes my patients not to return	-0.130	-0.126	-0.013	<b>0.819</b>	<b>0.630</b>	<b>0.858</b>	-0.140	-0.097	-0.117	0.129	0.399	0.088
Gets the patient upset with me	-0.108	-0.051	-0.070	<b>0.776</b>	<b>0.666</b>	<b>0.865</b>	-0.123	0.024	-0.065	0.156	0.380	0.139
Not my responsibility	-0.421	-0.235	-0.479	<b>0.404</b>	<b>0.593</b>	<b>0.335</b>	-0.250	-0.219	-0.236	0.348	-0.085	0.352
Help prevent spread of STD	0.206	0.182	0.064	-0.203	-0.101	-0.046	<b>0.676</b>	<b>0.711</b>	<b>0.776</b>	-0.025	-0.044	0.001
Fulfil my "duty to warn"	0.339	0.409	0.288	-0.156	0.056	-0.020	<b>0.493</b>	<b>0.387</b>	<b>0.570</b>	0.146	-0.334	0.164
Protects my patients from re-infection	0.091	0.149	0.069	-0.103	-0.013	-0.021	<b>0.764</b>	<b>0.778</b>	<b>0.804</b>	-0.074	-0.118	-0.104
Opportunity for prevention education	0.213	0.249	0.160	-0.129	-0.234	-0.108	<b>0.679</b>	<b>0.622</b>	<b>0.739</b>	-0.058	-0.030	0.010
Helps patients change their risk behaviour	0.131	-0.049	0.130	0.015	-0.079	-0.063	<b>0.723</b>	<b>0.759</b>	<b>0.736</b>	-0.164	-0.024	-0.151
Takes too much of my time	-0.330	-0.047	-0.177	0.308	0.845	0.176	0.005	-0.159	-0.034	<b>0.777</b>	<b>-0.232</b>	<b>0.901</b>
Takes too much staff time	-0.320	-0.035	-0.173	0.327	0.844	0.187	-0.001	-0.149	-0.045	<b>0.772</b>	<b>-0.236</b>	<b>0.896</b>
An activity I won't get paid for	0.157	0.081	-0.116	0.021	0.136	0.214	-0.135	-0.114	-0.054	<b>0.573</b>	<b>0.644</b>	<b>0.627</b>

N = 3844. CR = case reporting; PaR = patient referral; PrR = provider referral. Percentage of variance refers to the proportion of variance accounted for by each factor (I-IV) for each variable (CR, PaR, PrR). Reliability refers to coefficient  $\alpha$  (internal consistency) for each of the bold items defining the four factors (I-IV) across the three variables (CR, PaR, PrR).

**Table 3** Repeated measures multivariate analysis of variance of four scales

Scale	Range	Multivariate $F(8, 15366) = 941.83, p < 0.001$ .				$R^2(\text{sample}) = 0.267$ $R^2(\text{population}) = 0.266$			
		Case reporting		Patient referral		Provider referral		Univariate F	
		M	SD	M	SD	M	SD	df = 2, 7686	p Value
Norms	4–20	13.73	3.32	14.43	2.76	10.66	3.09	2191.55	<0.001
Patient relations	5–25	16.94	4.15	18.99	3.26	13.71	3.79	2997.94	<0.001
Infection control	5–25	18.62	3.51	18.86	3.25	17.18	3.69	527.78	<0.001
Time/money	3–15	8.75	2.68	10.36	2.20	6.79	2.61	3303.21	<0.001

N = 3844. Within rows, simple contrasts revealed that all means differ significantly from one another at  $p < 0.001$  (critical p value with a Bonferroni correction = 0.0042). The multiple correlation for the MANOVA = 0.518 (moderate size). High means indicate relatively high endorsement of the partner notification strategy. For example, a high mean for "time/money" on PaR relative to PrR indicates providers thought patient referral would be less troublesome relative to PrR in terms of time and money.

On one factor, time and money, physicians' opinions reflect objective conditions. Provider referral is more time consuming and consequently more expensive in terms of immediate costs, especially because neither doctors nor their staff are likely to be compensated. Provider referral may be more cost effective than other methods, but, at the time of choosing a partner notification method, the physician is faced with upfront costs, not the extended benefits.

Objective practice norms for partner notification are not easy to establish, largely because physicians are infrequently surveyed on the topic. Therefore, this paper essentially defines those norms and the factor represents them by definition. But do these specific norms reflect more general norms of service to patients? We look first at the relative scale scores on the factor "infection control." Physicians opined that patient referral was in fact a superior means of controlling STD to the other two methods, as shown in table 3. Although the difference in ratings was not very large, provider referral, when practised properly in the public sector, is substantially more effective at infection control.<sup>2,3</sup> We cannot make the same assertion about provider referral as practised by private physicians because there are no US data, but the principle of a professional contributing to STD control by collecting sex partner information and notifying partners is established.

Do physicians feel provider referral is less effective than patient referral because they specifically feel unable to practise this strategy? Comparing provider referral to case reporting and patient referral, the item means in table 1 do reflect relative discomfort and a sense of being untrained. These items are also found in factor II, "patient relations." Physicians may rightly suspect that poor training and discomfort would produce an exchange that would upset patients and cause them not to return. There is also the question of physicians' perceptions that provider referral is inherently offputting to patients. This latter perception, however, may not be true. Although patients can be upset by the prospect of their sex partners being told of their exposure to an STD, patients generally agree that referring partners is necessary.<sup>8,9</sup> These findings do not necessarily mean that such patients want their doctors to tell their sex partners—although Golden *et al*<sup>10</sup> present evidence that at least some patients have no objections—but it does establish that patients accept that someone has to do so.

The three different forms of partner notification are linked by the extent to which the diagnosing physician has to maintain contact with patients and their partners over the sensitive topic of sexual behaviour. With patient referral, the topic can be dismissed in a sentence or two; with provider referral, there is the matter of a more extensive interview. Many physicians are uncomfortable talking about sexual behaviour,<sup>11,12</sup> especially with opposite sex patients,<sup>13</sup> as well as some of the most at-risk patients—adolescents and young adults.<sup>14</sup> Consequently, the source of some of the imagined

distress to the patient-physician relationship may be actually caused by physician discomfort with talking about sex. Consistent with this interpretation of the scales are the results in table 1 showing that physicians felt least comfortable with and least trained to perform provider referral. What is missing from this equation is the extent to which patients genuinely dislike talking to physicians about their sexual behaviours and who are their sex partners. Some evidence suggests that patients are comfortable doing so if their physician is also comfortable.<sup>15</sup>

Perhaps if physicians were more comfortable talking to their patients about sex, especially to those patients with multiple partners, physicians would feel more comfortable with added steps such as eliciting partners' names, and perhaps even with contacting those partners. However, the barriers to provider referral in the United States almost certainly go beyond discomfort and lack of training and need examination of other options, including more effective combinations of the resources of physician practices and health departments. One avenue is to simply work on achieving an optimal case reporting system from all physicians to public sector health departments. Physicians could collect information needed to locate and contact partners and either report it to health departments or even pass it on directly to DIS. DIS and other health department staff in most jurisdictions have heavy workloads and locating information could help alleviate DIS workloads. Alternatively, physicians might also introduce a contract system for patients who wish to contact their partners themselves, as some prefer,<sup>16</sup> who would then have to agree to do so within an appropriate time frame. This triage approach essentially starts the partner notification process with physicians and transfers difficult cases to health departments or directly to DIS.

Note that embedded within both concepts are the principles of ready contact between physicians and health departments and a full and accurate sexual history from the patient. In the interests of informed consent, the fact that sexual behaviour and partner information could be forwarded to a health department would have to be disclosed to patients. Responses from this survey and previous data suggest that many physicians need training and practice in order to discuss sexual behaviour with their patients, but that they are not averse to moving beyond patient referral alone in principle.<sup>17</sup>

The tasks involved are large, but the end points have some advantages over the current system in the United States. Firstly, it involves the physicians who treat STD in partner notification. Precisely what interventions should be implemented is open to debate and evaluation, but the substantial STD morbidity in the United States suggests the burden of notification needs to be shared beyond DIS, but without relying solely on either patient or provider referral. Secondly, the necessary discussions between physician and patient

embed the discussion of sexual behaviour where it should be: an integral part of routine health care and something that can be taught and learned.<sup>11-18</sup> Early evidence that this task can be accomplished is found in Seattle, where King County private physicians collaborate in a joint partner notification and partner delivered medication system.<sup>19</sup> Finally, a reasonable policy goal for any hybrid system would be to spread costs as much as possible over the large and heterogeneous US healthcare system, including ensuring that any parties (for example, private physicians) who bear upfront costs are compensated for those costs.

In conclusion, results suggest relative antipathy towards provider based referral, with some reasons cohering with evidence based conclusions and some in conflict. These data not only describe the nature of these opinions, but also suggest some avenues for exploring improvements to STD partner notification.

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