

UCLA

UCLA Previously Published Works

Title

Potential Impact and Acceptability of Internet Partner Notification for Men Who Have Sex with Men and Transgender Women Recently Diagnosed with STD in Lima, Peru

Permalink

<https://escholarship.org/uc/item/55k4591m>

Journal

Sexually transmitted diseases, 41(1)

ISSN

1537-4521

Authors

Clark, Jesse L
Segura, Eddy R
Perez-Brumer, Amaya G
[et al.](#)

Publication Date

2014

Peer reviewed

**1 Potential Impact and Acceptability of Internet Partner Notification for Men Who Have Sex
2 with Men and Transgender Women Recently Diagnosed with STD in Lima, Peru**

3Jesse L Clark, MD, MSc¹, Eddy R Segura, MD, MPH¹, Amaya G Perez-Brumer, MSc¹, Sari L
4Reisner, MA, ScD^{2,3}, Jesus Peinado, MD, MSc⁴, Hector J Salvatierra, MD⁴, Jorge Sanchez, MD,
5MPH⁴, Javier R Lama, MD, MPH⁴

- 6 1. UCLA Geffen School of Medicine, Department of Medicine, Division of Infectious
7 Diseases and Center for World Health, Los Angeles, CA
8 2. The Fenway Institute, Boston, MA
9 3. Harvard School of Public Health, Department of Epidemiology, Boston, MA
10 4. Asociacion Civil Impacta Salud y Educacion, Lima, Peru

11

12Corresponding Author:

13Jesse L. Clark, MD, MSc
14Department of Medicine, Division of Infectious Diseases
15UCLA Geffen School of Medicine
1610833 Leconte Avenue, CHS 37-121
17Los Angeles, CA 90095
18Tel: (310) 601-7798
19Fax: (310) 825-3632

20

21Word Count:

22Summary: 29
23Abstract: 49
24Text: 1,510

25

26Statement of Disclosure:

27The authors declare no conflicts of interest.

28

29Sources of Support:

30Support provided by the National Institutes of Health (P30 MH58107, P30 AI028697, UL1
31TR000124, R25 TW009343, and K23 MH08461).

32**Summary**

33Anticipated use of internet partner notification among MSM/TW in Peru recently diagnosed with
34HIV and/or STD is high and likely to impact the frequency of notification in this population.

35

36**Abstract**

37We assessed the potential impact of internet partner notification (PN) among MSM and
38transgender women in Peru recently diagnosed with STD. Use of internet PN was anticipated for
3955.9% of recent partners, including 43.0% of partners not currently expected to be notified, a
4020.6% increase in anticipated notification outcomes.

41

42**Key Words:** Men Who Have Sex With Men; Transgender Women; Partner Notification;
43Sexually Transmitted Disease; Peru

44 Notification of sexual partners following sexually transmitted disease (STD) diagnosis is
45a key component of STD control . Public health systems in Peru and other developing countries
46often lack resources to support provider-based notification and rely on patient-initiated
47practices . New tools to support partner notification by patients are critical to improving STD
48control in developing countries.

49 Internet PN systems have been implemented in the US and other countries but not in
50Latin America. Prior surveys have found high levels of acceptability of internet-based
51notification and operational statistics of web-based notification systems such as www.InSpot.org
52suggest frequent use . However, studies assessing public awareness of inSPOT and actual use of
53the system among STD clinic patients have suggested low levels of penetration into these target
54groups . The only randomized clinical trial data of internet PN among men who have sex with
55men (MSM) found poor uptake of internet PN . We surveyed MSM and transgender women
56(TW) in Lima, Peru recently diagnosed with STD to assess the overall acceptability of internet
57PN systems, identify individual/partnership characteristics associated with likely use of internet
58PN, and estimate the potential impact of an internet-based notification system on PN outcomes
59among MSM/TW in Lima, Peru.

60 We enrolled 397 MSM/TW diagnosed with STD at the Asociación Civil Impacta Salud y
61Educación clinical research unit or the Alberto Barton municipal STD clinic in 2011.
62Enrollment was limited to men or TW reporting a recent male or transgender female sex partner
63diagnosed with HIV, syphilis, genital herpes, genital ulcer disease (GUD), proctitis, and/or
64urethritis within the previous 30 days. Participants were compensated 10 *Nuevos soles* (\$4 USD).
65The study was approved by the bioethics committees of UCLA and Asociación Civil Impacta
66Salud y Educación.

67 Participants completed a survey addressing demographics, HIV/STD history, PN
68attitudes, and recent sexual partner characteristics. Likert scales addressed general attitudes
69about PN, notification norms among their peers and partners, likelihood of notifying their three
70most recent partners, and anticipated method of notifying each partner (in person, by telephone,
71by email, by SMS, other). Additional questions surveyed the acceptability and likely use of an
72internet PN system (“a free website where you could send an anonymous message informing
73someone they may have been exposed to an STD”) in general; with specific partner types (Main
74Partners [“Someone you have a stable or long-term relationship with”], Casual Partners
75[“Someone you have had sex with once or more, but don’t have a stable or long-term
76relationship”], and Commercial Partners [“Someone you have sex with in exchange for money,
77food or other items”]); and with each of their three most recent partners. Since anonymous
78partners by definition cannot be contacted or notified (“Someone you have had sex with but
79don’t know their full name or how to contact them”), anonymous partners were excluded from
80partner-specific analyses. The incremental increase in anticipated notification resulting from
81introduction of internet PN was estimated by subtracting the fraction of non-anonymous partners
82likely to be notified under existing conditions from the total fraction of partners likely to be
83notified if internet PN were available.

84 Logistic regression models were fit to assess factors associated with acceptability of
85internet PN in general and for use specifically with main, casual, and commercial partners (if
86applicable). Bivariate logistic regression models were fit using Stata 11.0 (Stata Corporation,
87College Station, TX) to assess the association of likely use of internet PN with age, education
88level, sexual identity, sexual role, number of partners in the previous three months, diagnosis
89(HIV only, HIV and another STD, or other STD only) and perceived importance of notifying

90main and casual partners. Odds ratios with 95% confidence intervals were calculated with likely
91use of internet PN as the dependent variable. Factors found to be significant associations on
92unadjusted bivariate analysis ($p < 0.1$) and *a priori* confounders were incorporated into an
93adjusted multivariable logistic regression model.

94 To assess partner-specific attitudes and anticipated notification behavior, we used
95generalized estimating equations (GEE) to analyze likely notification behavior and potential use
96of internet PN with each of the participant's three most recent partners. Given that participants
97could report up to three partnerships, GEE were used to adjust for clustering by participant,
98assuming an unstructured covariance. GEE models included partner- and participant-level
99characteristics including partner type and gender as well as participant age, sexual identity, and
100HIV/STD diagnosis. Partnerships missing data for key variables were excluded from the model.
101No statistically significant patterns of missing partnership data were observed.

102 We enrolled 397 MSM and TW recently diagnosed with HIV and/or STD, the majority of
103whom had been recently diagnosed with syphilis (52.6%) and/or HIV infection (47.4%).
104Acceptability of a hypothetical internet-based notification system was high, with 59.2%
105anticipating overall use, and 57.6% likely to use internet notification for a main partner, 54.6%
106for a casual partner, and 23.2% for a commercial partner. Detailed characteristics of 1,065
107recent partners were provided by 397 participants: 345 Main partners, 444 Casual partners, 132
108Anonymous partners, 128 Commercial sex clients, and 16 Commercial sex workers. Participants
109anticipated notifying 48.2% of non-anonymous recent partners under existing conditions (74.2%
110of Main partners, 45.3% of Casual partners, and 20.1% of Commercial partners).

111 Multivariable analysis addressed factors associated with likely use of internet PN (Table
1121). Participants who considered notification of main and/or casual partners important were also

113more likely to anticipate use of internet PN (Adjusted Odds Ratio = 6.46 [95% CI = 1.63, 25.6]
114and 1.91 [95% CI = 1.09, 3.36], respectively).

115 In GEE analysis, internet notification was most likely to be used for primary (Relative
116Risk [RR] = 1.20 [95% CI = 1.05, 1.37]) and transgender female partners (RR = 1.20 [95% CI =
1171.04, 1.63]), and least likely with casual partners. There were no significant differences
118observed in anticipated use of internet PN between participants diagnosed with HIV compared
119with other STDs.

120 Partner-specific patterns of anticipated use showed substantial increases in frequency of
121potential internet notification with commercial and casual partners and a more modest effect
122among primary partners (Table 2). Availability of a hypothetical internet-based notification
123system resulted in a 20.6% overall increase in the frequency of anticipated notification for recent
124partners (from 52.1% to 72.7% of partners reported). The absolute difference in anticipated
125notification following introduction of an internet notification system was much higher among
126casual (24.3% difference) and commercial (25.0% difference) partners compared with main
127partners (13.9% difference).

128 Internet-based PN has the potential to improve outcomes and transform the practice of
129patient-initiated partner notification among MSM and TW in Lima, Peru. The acceptability of a
130free, anonymous internet PN system was high among MSM and TW recently diagnosed with
131HIV and/or STD, with participants reporting likely use with 55.9% of recent, notifiable partners.
132More importantly, participants stated that if internet-based PN were available, they would be
133likely to use it with 43.0% of the non-anonymous partners that they were not planning to notify
134under current conditions, an absolute increase in anticipated PN of 20.6%.

135 Anticipated use of internet notification was more likely for primary than casual or
136commercial partners. However, frequency of projected use of internet systems for informing
137main partners (63.7% of partners) was lower than the baseline level of anticipated notification
138for these partners (74.2%). In contrast, anticipated use of electronic PN for casual and
139commercial partners exceeded their baseline frequency of likely notification by approximately
14025% in both subgroups, suggesting that the introduction of free, anonymous internet PN could
141significantly improve outcomes in these high-risk sexual networks.

142 It is important to note that, since our analysis is based on anticipated notification behavior
143rather than actual PN outcomes, participants are likely to have overestimated their likelihood of
144notifying recent partners and of using internet systems for notification. Previous studies have
145found significant differences between acceptability or anticipated use of internet PN and
146observed impact on notification practices within MSM/TW communities . In addition, our
147survey presented a hypothetical internet-based system rather than a website prototype, requiring
148participants to anticipate possible advantages or disadvantages over traditional notification tools.
149Recent research from the U.S. and Europe has provided examples of how internet-based systems
150can be modified and integrated with existing PN counseling or contact tracing services to
151improve outcomes associated with use of new notification tools . Future studies should address
152the impact of internet-based systems on actual PN outcomes as well as strategies to optimize
153design and implementation of new partner notification technologies in resource-limited settings.

154 Our study demonstrates that internet-based notification could have a substantial impact
155on PN among MSM/TW in Peru. Introduction of a hypothetical web-based PN system was
156projected to result in substantial increases in casual and commercial partner notification among
157MSM/TW recently diagnosed with HIV and/or STD. The dramatic increase in anticipated

158notification of secondary partners suggests that the introduction of a free, anonymous internet-
159based system for PN could provide an alternative channel for communication within partnerships
160unstructured by pre-existing social or romantic ties. Future research is needed to evaluate the
161acceptability and actual use of internet-based notification systems, and their impact on PN
162outcomes among MSM/TW in developing countries.

163Works Cited

1641. Golden MR, Manhart LE. Innovative approaches to the prevention and control of
165bacterial sexually transmitted infections. *Infect Dis Clin North Am.* 2005;19(2):513-40.
1662. Hogben M. Partner notification for sexually transmitted diseases. *Clin Infect Dis.* 2007;44
167Suppl 3:S160-74.
1683. Mathews C, Coetzee D. Partner notification for the control of sexually transmitted
169infections. *BMJ.* 2007;334(7589):323.
1704. Hawkes S, Mabey D, Mayaud P. Partner notification for the control of sexually
171transmitted infections. *BMJ.* 2003;327(7416):633-4.
1725. Golden MR. Editorial: HIV partner notification: a neglected prevention intervention. *Sex*
173*Transm Dis.* 2002;29(8):472-5.
1746. Valles X, Carnicer-Pont D, Casabona J. Estudios de contactos para infecciones de
175transmision sexual: una actividad descuidada? *Gac Sanit.* 2011;25(3):224-32.
1767. Wang AL, Peng RR, Tucker JD, Cohen MS, Chen XS. Partner notification uptake for
177sexually transmitted infections in China: a systematic literature review. *Sex Transm Infect.*
1782012;88(5):386-93.
1798. Faxedid E, Tembo G, Ndulo J, Krantz I. Individual counseling of patients with sexually
180transmitted diseases. A way to improve partner notification in a Zambian setting? *Sex Transm*
181*Dis.* 1996;23(4):289-92.
1829. Mimiaga MJ, Fair AD, Tetu AM, Novak DS, Vanderwarker R, Bertrand T, et al.
183Acceptability of an Internet-based partner notification system for sexually transmitted infection
184exposure among men who have sex with men. *Am J Public Health.* 2007.
18510. Mimiaga MJ, Tetu AM, Gortmaker S, Koenen KC, Fair AD, Novak DS, et al. HIV and
186STD Status Among MSM and Attitudes About Internet Partner Notification for STD Exposure.
187*Sex Transm Dis.* 2007.

18811. Bilardi JE, Fairley CK, Hopkins CA, Hocking JS, Temple-Smith MJ, Bowden FJ, et al.
189Experiences and outcomes of partner notification among men and women recently diagnosed
190with chlamydia and their views on innovative resources aimed at improving notification rates.
191Sex Transm Dis. 2010;37(4):253-8.
19212. Kachur R, Adelson S, Firenze K, Herrera M. Reaching patients and their partners
193through mobile: text messaging for case management and partner notification. Sex Transm Dis.
1942011;38(2):149-50.
19513. Bilardi JE, Fairley CK, Hopkins CA, Hocking JS, Sze JK, Chen MY. Let Them Know:
196evaluation of an online partner notification service for chlamydia that offers E-mail and SMS
197messaging. Sex Transm Dis. 2010;37(9):563-5.
19814. Levine D, Woodruff AJ, Mocello AR, Lebrija J, Klausner JD. inSPOT: the first online STD
199partner notification system using electronic postcards. PLoS Med. 2008;5(10):e213.
20015. Plant A, Rotblatt H, Montoya JA, Rudy ET, Kerndt PR. Evaluation of inSPOTLA.org: an
201Internet partner notification service. Sex Transm Dis. 2012;39(5):341-5.
20216. Rietmeijer CA, Westergaard B, Mickiewicz TA, Richardson D, Ling S, Sapp T, et al.
203Evaluation of an online partner notification program. Sex Transm Dis. 2011;38(5):359-64.
20417. Kerani RP, Fleming M, DeYoung B, Golden MR. A randomized, controlled trial of
205inSPOT and patient-delivered partner therapy for gonorrhea and chlamydial infection among
206men who have sex with men. Sex Transm Dis. 2011;38(10):941-6.
20718. Rietmeijer CA. Using social media for partners services in adolescents. Sex Transm
208Infect. 2013;89(S1):A12.
20919. Bernstein KT. Assessing the added value of internet partner services for syphilis and
210HIV. Sex Transm Infect. 2013;89(S1):A40.
21120. van Rooijen MS, Vriens P, Gotz H, Heijman T, Voeten H, Koekenbier R. Acceptance of
212an onling partner notification tool for STI, called Suggest-a-Test. Sex Transm Infect.
2132013;89(S1):A335.

Table 1. Crude and Adjusted Logistic Regression of Participant Characteristics Associated with Likely Use of an Internet Partner Notification System Among Men Who Have Sex with Men (MSM) and Transgender Women (TW) Recently Diagnosed with HIV/STD; Lima, Peru 2011

		Unadjusted		Adjusted	
		OR	95% CI	OR	95% CI
Age (Years)		1.01	(0.99, 1.04)	1.02	(0.99, 1.04)
Education (Secondary School Graduate)		1.23	(0.74, 2.05)	1.06	(0.59, 1.92)
Sexual Identity	Heterosexual	Ref		--	
	Bisexual	0.73	(0.24, 2.29)	--	
	Homosexual	0.48	(0.17, 1.36)	--	
	Transgender	0.63	(0.19, 2.02)	--	
Number of Sexual Partners (3 Months)		1.00	(0.99, 1.01)	1.01	(0.99, 1.02)
HIV/STD Diagnosis	HIV Only	Ref		--	
	HIV and Other STD	1.16	(0.62, 2.18)	1.10	(0.56, 2.17)
	Other STD Only	1.30	(0.73, 2.30)	1.08	(0.60, 2.09)
Considers Notification of Main Partners Important		8.17**	(2.65, 25.2)	6.46**	(1.63, 25.6)
Considers Notification of Casual Partners Important		2.5**	(1.52, 4.12)	1.91*	(1.09, 3.36)

*p<0.05

**p<0.01

Table 2. Potential Impact of Internet Systems on Notification of Recent Partners Among Men Who Have Sex with Men (MSM) and Transgender Women (TW) Recently Diagnosed with HIV/STD; Lima, Peru 2011

	Main Partners (N=345)	Casual Partners (N=444)	Commercial Sex Partners (N=144)	All Partners* (N=933)
Recent Partners Likely to Be Notified with Existing PN Resources	74.2%(256/345)	45.3%(201/444)	20.1%(29/144)	52.1%(486/933)
Recent Partners Likely to Be Notified with Internet PN (All Partners)	63.7%(220/345)	54.5%(242/444)	41.7%(60/144)	55.9%(522/933)
Recent Partners Likely to Be Notified with Internet PN (Only Partners Unlikely to Be Notified with Existing Resources)	53.9%(48/89)	44.4%(108/243)	31.3%(36/115)	43.0%(192/447)
Recent Partners Likely to Be Notified with Traditional and/ or Internet PN Resources	88.1%(304/345)	69.6%(309/444)	45.1%(65/144)	72.7%(678/933)

217 * Anonymous partners excluded

218

219