Published in final edited form as:

Sex Transm Dis. 2008 November ; 35(11): 960–965. doi:10.1097/OLQ.0b013e3181824f4d.

Internet and Email Use Among STD Clinic Patients

Karen E. Mark, MD, MPH^{1,2}, Anna Wald, MD, MPH^{1,2,3,4}, Linda Drolette, BS³, and Matthew R. Golden, MD, MPH^{1,4,5}

¹Department of Medicine, University of Washington, Seattle, Washington

²Vaccine and Infectious Diseases Institute, Fred Hutchinson Cancer Research Center, Seattle, Washington

³Department of Laboratory Medicine, University of Washington, Seattle, Washington

⁴Department of Epidemiology, University of Washington, Seattle, Washington

⁵Public Health Seattle & King County, Seattle, Washington

Abstract

Background—Little data exist on Internet and email use among STD clinic patients for research and clinical care communication.

Methods—An anonymous cross-sectional survey of STD clinic patients aged ≥ 18 years in Seattle, Washington, March 13–22, 2006.

Results—Of 489 study period patients, 251 (51%) completed the questionnaire. Participants had a median age of 30 (range 18–66) years and were 69% male, 56% White, 19% African-American, 9% Hispanic, and 7% Asian/Pacific Islander. 75% had some post-secondary education but half reported an annual income of $<US\$15,000$. Of 251 participants, 200 (80%) reported using the Internet from a private location at least once a week, 190 (76%) had their own email that they check at least 3 times a week, and 144 (57%) were willing to receive an email reminding them to come back for a follow-up appointment if diagnosed with an STD. MSM were more likely than women and heterosexual men to be regular Internet and email users (92% versus 70%, $p = 0.001$) and to have met a sex partner over the Internet during the past year (69% versus 11%, $p < 0.001$). Higher educational level and income, but not age or gender, were also associated with Internet and email use, as was racial/ethnic background (86% of Whites, 48% of African-Americans, 73% of Hispanics, 100% of Asians/Pacific Islanders, and 57% of others, $p < 0.001$).

Conclusions—Internet and email use are common and acceptable to many STD clinic patients for research and clinical purposes.

Keywords

Internet; sexually transmitted diseases; health communication; electronic mail

Introduction

Although much has been written about the role of the Internet in the spread of STDs^{1–9}, relatively less has been written about the Internet in general, or email in particular, as a tool in the prevention of STDs^{7, 10–14}. Concerns of persons considering using the Internet for health information include the quality of information available online, privacy concerns, and access

to the Internet^{12, 15}. Although Internet access is present in 62% of US households, access is less common in the households of persons with a high school education or less, Black, Hispanic, and Native American/Alaska Native households, and households with an annual income of less than \$35,000¹⁶. Little published data have examined Internet access among STD clinic attendees, who tend to have lower levels of education and income and be more racially diverse than the general population^{17–19}. High levels of Internet and email access and acceptability among STD clinic attendees would suggest that these modalities could be used more extensively to provide public health and clinical follow-up services to this population as well as to conduct STD-related research among participants recruited from STD clinics.

Materials and Methods

From March 13–22, 2006, all patients ≥ 18 years of age attending the Public Health Seattle & King County (PHSKC) STD Clinic, located in Seattle, Washington, were invited to participate in an anonymous, self-administered questionnaire. The 2 page paper questionnaire consisted of 16 multiple choice questions and a question asking participant age. Clinicians handed patients the questionnaire while the patient waited in a private room for laboratory testing to be completed. To assure anonymity, participants sealed their completed questionnaire in an envelope prior to returning it to the clinician. The University of Washington Institutional Review Board determined that the questionnaire was exempt from research human subjects review.

Statistical analyses

Data analysis was done using Intercooled Stata 9.1 (College Station, TX). We defined men who have sex with men (MSM) as men who reported sex with men only or sex with both men and women, and defined women who have sex with women (WSW) as women who reported sex with women only or with both men and women, in the last 12 months. Participants could check multiple boxes describing their race/ethnicity. For analysis, persons who reported being Hispanic, regardless of other boxes checked, were reported as Hispanic. All others who checked multiple boxes were reported as “Other”. Proportions were calculated as the number of positive responses divided by the number of persons responding to each question. We performed bivariate tests of association using Fisher’s Exact Test and Pearson chi-square tests and used logistic regression to define multivariate predictors of Internet and email use among participants. Because 100% of 16 Asian/Pacific Islanders reported regular Internet and email access, they were grouped with Whites, of whom 86% reported regular Internet and email access, in the logistic regression analysis.

Results

Four hundred eighty-nine patients 18 years of age or older entered the STD clinic during the study period, of whom 251 (51%) completed the questionnaire. Questionnaire participants were similar to the entire clinic population in age, sex, race/ethnicity, sexual orientation, and number of sex partners in the previous 12 months (Table 1). Participants had a median age of 30 (range 18–66) years, were 69% male, and 56% White (Table 1). Although 75% reported at least some post-secondary education, half reported an annual income of less than \$15,000 per year.

Two hundred (80%) participants reported using the Internet from a private location at least once per week, 151 (60%) from home, 38 (15%) from another private location, and 11 (4%) from both home and another private location (Table 2). Fifty-seven (24%) participants reported meeting a sex partner over the Internet during the past 12 months. MSM were more likely than women and heterosexual men to have met a sex partner over the Internet during the past year [35 of 51 (69%) MSM, 13 of 98 (13%) heterosexual men, and 6 of 74 (8%) women, $p < 0.001$].

Of all respondents, 144 (59%) reported that if they tested positive for an STD today it would be okay for the clinic to send an email reminding them to come back for a follow-up appointment, and 70 (28%) reported that they would be interested in receiving a newsletter via email related to health issues. These percentages remained virtually unchanged when restricted to the 190 (76%) participants who reported having their own email account that they check at least 3 times per week [124 (65%) participants reported they would be willing to receive a follow-up appointment email and 54 (28%) were interested in receiving a newsletter via email].

Of the 190 (76%) participants who reported having their own email account that they check at least 3 times per week, 183 (96%) had a personal email account, 24 (13%) a work email account, and 18 (9%) an email account through school. (Twenty-nine people had 2 email accounts and 3 had all 3 types of email account.) Of these 190 persons, 101 (53%) reported that they would feel comfortable getting “reminder” emails about a sexual health research study, 75 (39%) would not want to get such emails, and 13 (7%) reported that they would never choose to participate in a sexual health research study. Participants were told that “reminder” emails would not contain confidential information or say anything about STDs or health, but would instead say things like, “Please call X phone number to make your 3 month study appointment.”

The survey also asked the 200 persons who reported regular Internet access if they would feel comfortable going to a secure (password-protected) confidential website to enter information, such as day of last sexual intercourse and whether or not a condom was used, for a sexual health research study. Of 197 persons who responded to this question, 113 (57%) answered “Yes,” 57 (29%) answered “No, I would not be comfortable providing that information through the Internet, but I would be willing to provide that information for a study using a paper questionnaire,” and 27 (14%) answered that they would never choose to be in a research study that required providing such information.

One hundred eighty-four (74%) participants reported both Internet use from a private location at least once per week and having their own email that they check at least 3 times per week. Higher educational level and income were significantly associated with the combined endpoint of regular Internet and email use, as was being MSM (Table 3). African-Americans were approximately half as likely, and persons of other race/ethnicity approximately a third as likely, to regularly use the Internet and email than Whites and Asian/Pacific Islanders. Regular Internet and email use was similar among Hispanics and Whites and Asian/Pacific Islanders. Age and sex were not predictive of Internet and email use. In a multivariate model adjusting for sexual orientation, race/ethnicity, educational level, and income, higher levels of education and income remained significantly associated with regular Internet and email use, and African Americans and persons of other race/ethnicity remained significantly less likely to regularly use the Internet and email than Whites and Asian/Pacific Islanders. However, the association between sexual orientation and Internet and email use was no longer present after adjusting for other predictors.

Discussion

Numerous studies have found that using the Internet to find sex partners is common among MSM^{1–5, 7–9}, and several have associated syphilis or HIV acquisition in that population with use of the Internet^{1, 8, 20}. On the other hand, a recent analysis found that heterosexuals who used the Internet to find partners were at lower risk for STDs than other heterosexual STD clinic patients²¹, highlighting the complexity of how the Internet may affect STD risk and transmission dynamics. Little information is available regarding Internet and email use among STD clinic patients and the potential utility of using both to improve clinical care and facilitate STD-related research^{17–19}. The Internet has been used to arrange for syphilis testing and provide test results^{10, 14}, to follow-up on partners of reported syphilis cases¹³, to provide test

results to all clients of an STD clinic²², and to collect sexual diary information for a genital human papilloma virus research study²³. We found that Internet and email use were common and acceptable to many STD clinic patients for clinical and research purposes, in spite of the low household income of the population. However, we also found that regular Internet and email use was more common with increasing levels of education and household income and among MSM as compared with all others, and less common among African Americans and persons of other race/ethnicity, who were predominantly bi- or multiracial persons.

Although our data suggest that Internet and email use are extremely common among STD clinic patients and that many patients are willing to use electronic communication for clinical, public health, or research purposes, they also suggest that relying exclusively on electronic communication would exclude some populations at high risk for STDs. Interestingly, disparities in telephone access also exist, with lack of either land line or cell phone telephone access more common among persons of Black or Hispanic race/ethnicity, lower educational attainment, and lower income^{24, 25}. However, these disparities affect fewer people since 95–98% of US households have either land line or cell phone telephone access^{24, 25}, compared with 62% of US households having Internet access¹⁶. Other groups are using text messaging for communication of sexual health information^{26, 27}, although similar disparities in cell phone access also exist²⁵.

Internet use among our patients is higher than that reported in most previous studies. In 1999, 40% of San Francisco STD clinic patients reported having Internet access at home and, of these persons, 84% had accessed the Internet in the past 6 months¹⁷. In 2000–2001, 46% of Denver Metro Health STD clinic patients had Internet access, of these 73% at home¹⁸, while in 2002–2003, 77% of patients at a genitourinary medicine (GUM) clinic in Plymouth, U.K. and 90% of patients at a GUM clinic in London, U.K. had Internet access¹⁹. In 2006, 63% of MSM seen in a Seattle, Washington public HIV clinic reported home Internet access²⁸. Thus our 2006 finding of 80% of Seattle STD clinic patients having regular Internet access, with 64% of all patients having regular Internet access at home, is higher than estimates from U.S. studies conducted 1999–2001, but similar to more recent U.K studies, possibly reflecting an overall trend toward more widespread Internet access nationally and internationally²⁹.

Although three quarters of our population reported regular Internet and email access, only about half reported that they would be comfortable getting reminder emails containing appointment information related to clinical care or research and only 28% reported being interested in receiving a health e-newsletter. Some of the reluctance may be specifically related to Internet confidentiality since among those with regular Internet access, 29% replied that they would be willing to provide detailed sexual behavior data for a research study on a paper questionnaire but not via a secure website. These data indicate that issues related to confidentiality will need to be addressed explicitly before implementation of Internet or email-based communication modalities for clinical care or research, to maximize patient acceptability.

Our study has several limitations. Because our participants came from one STD clinic, our results may not be generalizable to other geographic areas. Certainly, patient populations do differ among STD clinics. For example, STD clinics on the west coast of the United States have a higher proportion of MSM patients and a lower proportion of African American patients than those in the southern United States^{30–32}. However, we have specifically examined Internet and email access by subgroup to allow others to apply our findings to different populations. United States census data indicate that household Internet access is highest in the west and lowest in the south, with the south trailing the west by about 7 percentage points¹⁶. Secondly, our questionnaire response rate of 51% could have introduced bias if questionnaire participants were different from non-participants in use of electronic communication modalities. However, we believe that response bias is unlikely both because questionnaire

participants were similar to non-participants in all ways measured (Table 1) and because, anecdotally, some non-response was due to the clinic intermittently running out of questionnaires during the study period. Finally, the results of our logistic regression analysis need to be interpreted cautiously, since our combined endpoint of regular Internet and email use does not meet the common definition of a rare endpoint³³. As a result, although the method can be used to adjust for confounding as we have done, the odds ratios significantly overestimate risk ratios and should not be interpreted as reflecting relative risks.

Our study indicates that a majority of STD clinic patients have regular Internet and email access, and that many are willing to use these communication modalities for clinical care and research purposes. These modalities could be useful in improving communication with patients regarding follow-up care and could save time for clinics and patients. As a result, we believe offering patients electronic communication options is appropriate, feasible, and should be a goal. However, significant barriers may inhibit these efforts. Although many physicians use email to communicate with patients³⁴, and both the American Medical Association and the American Medical Informatics Association have issued guidelines defining safeguards related to the privacy of email and indicating that electronic communications are acceptable^{35, 36}, the security of email communication may still be a barrier in many practice settings and health departments. For example, PHSKC does not at present permit clinicians to routinely send patients emails, even with prior patient consent. The extent to which privacy concerns limit public health and clinical activities elsewhere is unknown. Our findings suggest that most STD clinic patients have access to email and the Internet, and that many are interested in using electronic communication for clinical and research purposes. Future public health and research activities should seek to diminish barriers to use of electronic communication and to evaluate how these communications can improve clinical care, prevention efforts, and clinical research.

Acknowledgments

Financial support: Supported by NIH/NIAID grants T32 AI07044, K23 AI071257, and K24 AI071113.

References

1. Klausner JD, Wolf W, Fischer-Ponce L, Zolt I, Katz MH. Tracing a syphilis outbreak through cyberspace. *JAMA* 2000;284:447–449. [PubMed: 10904507]
2. McFarlane M, Bull SS, Rietmeijer CA. The Internet as a newly emerging risk environment for sexually transmitted diseases. *JAMA* 2000;284:443–446. [PubMed: 10904506]
3. Internet use and early syphilis infection among men who have sex with men--San Francisco, California, 1999–2003. *MMWR Morb Mortal Wkly Rep* 2003;52:1229–1232. [PubMed: 14681596]
4. Ashton M, Sopwith W, Clark P, McKelvey D, Lighton L, Mandal D. An outbreak no longer: factors contributing to the return of syphilis in Greater Manchester. *Sex Transm Infect* 2003;79:291–293. [PubMed: 12902577]
5. Kim AA, Kent C, McFarland W, Klausner JD. Cruising on the Internet highway. *J Acquir Immune Defic Syndr* 2001;28:89–93. [PubMed: 11579282]
6. McFarlane M, Bull SS, Rietmeijer CA. Young adults on the Internet: Risk behaviors for sexually transmitted diseases and HIV-1. *J Adolesc Health* 2002;31:11–16. [PubMed: 12090960]
7. Wong W, Chaw JK, Kent CK, Klausner JD. Risk factors for early syphilis among gay and bisexual men seen in an STD clinic: San Francisco, 2002–2003. *Sex Transm Dis* 2005;32:458–463. [PubMed: 15976605]
8. Jayaraman GC, Read RR, Singh A. Characteristics of individuals with male-to-male and heterosexually acquired infectious syphilis during an outbreak in Calgary, Alberta, Canada. *Sex Transm Dis* 2003;30:315–319. [PubMed: 12671551]
9. Russell CJ, Golub SA, Cohen DE, Mayer KH. Urine-based asymptomatic urethral gonorrhea and chlamydia screening and sexual risk-taking behavior in men who have sex with men in greater Boston. *AIDS Patient Care STDS* 2007;21:205–211. [PubMed: 17428188]

10. Klausner JD, Levine DK, Kent CK. Internet-based site-specific interventions for syphilis prevention among gay and bisexual men. *AIDS Care* 2004;16:964–970. [PubMed: 15511728]
11. Mimiaga MJ, Fair AD, Tetu AM, et al. Acceptability of an Internet-based partner notification system for sexually transmitted infection exposure among men who have sex with men. *Am J Public Health* 2008;98:1009–1011. [PubMed: 17901442]
12. Bull SS, McFarlane M, King D. Barriers to STD/HIV prevention on the Internet. *Health Educ Res* 2001;16:661–670. [PubMed: 11780706]
13. Using the Internet for partner notification of sexually transmitted diseases--Los Angeles County, California, 2003. *MMWR Morb Mortal Wkly Rep* 2004;53:129–131. [PubMed: 14981362]
14. Levine DK, Scott KC, Klausner JD. Online syphilis testing--confidential and convenient. *Sex Transm Dis* 2005;32:139–141. [PubMed: 15668622]
15. Winker MA, Flanagan A, Chi-Lum B, et al. Guidelines for medical and health information sites on the Internet: Principles governing AMA web sites. *JAMA* 2000;283:1600–1606. [PubMed: 10735398]
16. Networked Nation. Broadband In America 2007. Washington, D.C.: National Telecommunications and Information Administration, United States Department of Commerce; 2008. p. 58-59.
17. Klausner JD. Websites and STD services. *Sex Transm Dis* 1999;26:548. [PubMed: 10534211]
18. Rietmeijer CA, Bull SS, McFarlane M, Patnaik JL, Douglas JM Jr. Risks and benefits of the Internet for populations at risk for sexually transmitted infections (STIs): Results of an STI clinic survey. *Sex Transm Dis* 2003;30:15–19. [PubMed: 12514436]
19. Malu MK, Challenor R, Theobald N, Barton SE. Seeking and engaging in Internet sex: A survey of patients attending genitourinary medicine clinics in Plymouth and in London. *Int J STD AIDS* 2004;15:720–724. [PubMed: 15537455]
20. Thiede H, Jenkins RA, Carey JW, et al. Determinants of recent HIV infection among Seattle-area men who have sex with men. *Am J Public Health* 2008;29:29.
21. Al-Tayyib A, Rietmeijer C. Finding Sex Partners On-Line: What's the Risk for STI? Might There Be a Benefit? National STD Prevention Conference, Chicago, Illinois. 2008
22. Kohn RP, Williams D, Klausner JD. Getting STD test results over the Internet: San Francisco, 2005. National STD Prevention Conference. 2006
23. Baer A, Saroiu S, Koutsky LA. Obtaining sensitive data through the Web: an example of design and methods. *Epidemiology* 2002;13:640–645. [PubMed: 12410004]
24. Blumberg SJ, Luke JV, Cynamon ML. Telephone coverage and health survey estimates: evaluating the need for concern about wireless substitution. *Am J Public Health* 2006;96:926–931. [PubMed: 16571707]Epub 2006 Mar 29
25. Tucker C, Brick JM, Meekins B. Household telephone service and usage patterns in the United States in 2004: Implications for telephone samples. *Public Opinion Quarterly* 2007;71:3–22.
26. Levine D, McCright J, Dobkin L, Woodruff AJ, Klausner JD. SEXINFO: a sexual health text messaging service for San Francisco youth. *Am J Public Health* 2008;98:393–395. [PubMed: 18235068]Epub 2008 Jan 30
27. Teenagers to get safe sex texts. *BBC News* 2004;Vol. 2008
28. Golden MR, Wood RW, Buskin SE, Fleming M, Harrington RD. Ongoing risk behavior among persons with HIV in medical care. *AIDS Behav* 2007;11:726–735. [PubMed: 17497217]Epub 2007 May 12
29. Day J, Janus A, J D. Computer and Internet Use in the United States: 2003: U.S. Department of Commerce, Economics and Statistics Administration. U.S. Census Bureau 2005:P23–P208.
30. Fox KK, del Rio C, Holmes KK, et al. Gonorrhea in the HIV era: a reversal in trends among men who have sex with men. *Am J Public Health* 2001;91:959–964. [PubMed: 11392941]
31. Sizemore JM Jr, Sanders WM, Lackey PC, Ennis DM, Hook EW 3rd. Comparison of STD burden and risk among men with and without regular doctors attending a southern urban STD clinic. *Sex Transm Dis* 2003;30:512–515. [PubMed: 12782953]
32. Kurth AE, Martin DP, Golden MR, et al. A comparison between audio computer-assisted self-interviews and clinician interviews for obtaining the sexual history. *Sex Transm Dis* 2004;31:719–726. [PubMed: 15608586]

33. Rothman, K.; Greenland, S. Modern Epidemiology. Philadelphia: Lippincott-Raven Publishers; 1998. p. 244
34. Brooks RG, Menachemi N. Physicians' use of email with patients: factors influencing electronic communication and adherence to best practices. J Med Internet Res 2006;8:e2. [PubMed: 16585026]
35. Robertson J. Guidelines for physician-patient electronic communications: American Medical Association. website
<http://www.amaassn.org/offcampus.lib.washington.edu/ama/pub/category/2386.html>, 2001
36. Kane B, Sands DZ. Guidelines for the clinical use of electronic mail with patients. The AMIA Internet Working Group, Task Force on Guidelines for the Use of Clinic-Patient Electronic Mail. J Am Med Inform Assoc 1998;5:104–111. [PubMed: 9452989]

Table 1
Demographic characteristics of questionnaire participants and all STD clinic patients seen during questionnaire period, Seattle, Washington STD Clinic Internet/Email Questionnaire, 2006.

Characteristic	Questionnaire participants (n = 251)		All STD clinic patients seen during questionnaire period (n = 489)	
	n	(%)	n	(%)
Age *				
18–24 years old	61	(25)	111	(23)
25–29 years old	54	(22)	108	(22)
30–39 years old	75	(31)	139	(28)
40+ years old	55	(22)	131	(27)
Sex *				
Male	171	(69)	363	(74)
Female	77	(31)	126	(26)
Sexual orientation *				
Heterosexual	161	(72)	313	(68)
MSM	59	(26)	143	(31)
WSW	4	(2)	1	(0.2)
Race/ethnicity *				
African American	46	(19)	106	(22)
Asian/Pacific Islander	16	(7)	35	(7)
Hispanic	22	(9)	45	(9)
White	132	(56)	268	(57)
Other †	21	(9)	20	(4)
Number of vaginal/anal sex partners in prior 12 mos *				
0	20	(8)	16	(4)
1	60	(25)	81	(22)
2	49	(20)	85	(23)
3	37	(15)	58	(16)
4 or more	74	(31)	133	(36)
Education level *				
Less than 12th grade	13	(5)	NA	NA
High school diploma or GED	48	(20)	NA	NA
Some college or technical school	103	(43)	NA	NA
4 year college diploma or more	77	(32)	NA	NA
Annual household income *				
Less than \$15,000	118	(50)	NA	NA
\$15,001–\$30,000	55	(23)	NA	NA
\$30,001–\$50,000	28	(12)	NA	NA
Over \$50,000	36	(15)	NA	NA
Marital status *				
Single	195	(79)	NA	NA
Living with a partner	34	(14)	NA	NA

Characteristic	Questionnaire participants (n = 251)		All STD clinic patients seen during questionnaire period (n = 489)	
	n	(%)	n	(%)
Married	17	(7)	NA	NA
HIV positive (by self-report) *	12	(5)	NA	NA
HSV-2 positive (by self-report) *	28	(12)	NA	NA

* For questionnaire participants, age missing for 6 persons, sex or persons, sexual orientation for 27 persons, race/ethnicity for 14 persons, number of sex partners for 11 persons, educational level for 10 persons, income for 14 persons, marital status for 5 persons, HIV status for 12 persons, and HSV-2 serostatus for 18 persons. For all STD clinic patients, age missing for 0 persons, sex for 0 persons, sexual orientation for 32 persons, race/ethnicity for 15 persons, and number of sex partners for 116 persons.

† "Other" race/ethnicity includes, among questionnaire respondents, 15 non-Hispanic bi- or multiracial persons (of whom 78% were part White, 57% part Native American, 50% part African American, and 43% part Asian/Pacific Islander), 1 non-Hispanic Native American, and 5 persons of other race/ethnicity.

MSM = Men who have sex with men (among questionnaire respondents, includes 51 who reported sex with men only and 8 who reported sex with both men and women in the past 12 months).

WSW = Women who have sex with women (among questionnaire respondents, includes 1 who reported sex with women only and 3 who reported sex with both men and women in the past 12 months).

NA = Not available.

Table 2

Internet and email use and acceptability for research and clinical care purposes, Seattle, Washington STD Clinic Internet/Email Questionnaire, 2006.

Outcome	n	(%)
Use the Internet from a private location at least once per week *	200	(80)
Met a sex partner over the Internet during last 12 months *	57	(24)
Have own email that check at least 3 times per week	190	(76)
Use the Internet from a private location at least once per week AND have own email that check at least 3 times per week *	184	(74)
Comfortable getting "reminder" emails for a sexual health research study †	101	(53)
Comfortable going to secure website to enter date of last sex and whether or not a condom was used for a research study **		
Yes	113	(57)
No, but would provide the information via a paper questionnaire	57	(29)
No, wouldn't chose to be in a study at all that required such information	27	(14)
If tested positive for an STD today, okay for clinic to send an email reminding you to come back for a follow-up appointment (not a study)? *	144	(59)
Interested in receiving a non-study email newsletter related to health issues *	70	(28)

* Internet use missing for 1 person, met a partner over the Internet for 11 persons, email for 2 persons, Internet and email for 1 person, follow-up email if tested positive for STD missing for 5 persons, and health newsletter missing for 4 persons.

† Of 190 persons who reported having their own email account which they check at least 3 times a week

** Of 200 persons reporting Internet access, minus 3 persons who skipped the question.

Table 3
Predictors of Internet and email use among participants, Seattle, Washington STD Clinic Internet/Email Questionnaire, 2006.

Characteristic	With Internet and email use				
	n	(%)	Crude OR	95% CI	Adjusted OR* (95% CI)
Age					
18–24 years old	46	(75)	ref		
25–29 years old	39	(72)	0.9	(0.4, 2.0)	
30–39 years old	57	(76)	1.0	(0.5, 2.3)	
40+ years old	38	(70)	0.8	(0.3, 1.8)	
Sex					
Male	126	(74)	ref		
Female	57	(74)	1.0	(0.5, 1.8)	
Sexual orientation					
MSM	54	(90)	4.2	(1.7, 10.2)	1.5 (0.5, 4.3)
All others	130	(68)	ref		
Race/ethnicity					
African American	22	(48)	0.1	(0.1, 0.3)	0.2 (0.1, 0.5)
Other	12	(57)	0.2	(0.1, 0.5)	0.3 (0.1, 0.9)
Hispanic	16	(73)	0.4	(0.1, 1.1)	0.4 (0.1, 1.4)
White or Asian/Pacific Islander	128	(87)	ref		
Education level					
High school diploma/GED or less	30	(49)	ref		
Some college or technical school	79	(77)	3.4	(1.7, 6.7)	3.3 (1.5, 7.0)
4 year college diploma or more	70	(92)	12.1	(4.6, 32.0)	5.2 (1.9, 13.9)
Income					
Less than \$15,000 per year	70	(59)	ref		
\$15,001–\$30,000 per year	46	(85)	3.9	(1.7, 9.1)	2.3 (0.8, 6.4)
\$30,001–\$50,000 per year	25	(89)	5.7	(1.6, 20.1)	3.1 (0.7, 13.1)
Over \$50,000 per year	35	(97)	24.0	(3.2, 182.0)	8.2 (1.0, 65.9)

* Adjusted for sexual orientation, race/ethnicity, educational level, and income.

MSM = Men who have sex with men

GED = General Educational Development