Acceptability of the Internet-Based Chlamydia Screening Implementation in the Netherlands and Insights Into Nonresponse

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Background: The study assessed the acceptability of internet-based Chlamydia screening using home-testing kits among 16- to 29-year-old participants and nonparticipants in the first year of a Chlamydia Screening Implementation program in the Netherlands.

Methods: Questionnaire surveys were administered to randomly selected participants (acceptability survey) and nonparticipants (nonresponse survey) in 3 regions of the Netherlands where screening was offered. Participants received email invitations to an online survey; nonparticipants received postal questionnaires. Both surveys enquired into opinions on the screening design, reasons for (non-) participation and future willingness to be tested.

Results: The response rate was 63% (3499/5569) in the acceptability survey and 15% (2053/13,724) in the nonresponse survey. Primary motivation for participating in the screening was "for my health" (63%). The main reason for nonresponse given by sexually active nonparticipants was "no perceived risk of infection" (40%). Only 2% reported nonparticipation due to no internet access. Participants found the internet (93%) and home-testing (97%) advantages of the program, regardless of test results. Two-thirds of participants would test again, 92% via the screening program. Half of nonparticipants were appreciative of the program design, while about 1 in 5 did not like internet usage, home-testing, or posting samples.

Conclusions: The screening method was highly acceptable to participants. Nonparticipants in this survey were generally appreciative of the program design. Both groups made informed choices about participation and surveyed low-risk nonparticipants accurately perceived their low-risk status. Although many nonparticipants were not reached by the nonresponse survey, current insights on acceptability and nonresponse are undoubtedly valuable for evaluation of the current program.

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The authors thank all respondents to the survey. Alma van Woudenberg is acknowledged for contribution to survey-design, development of questionnaires and sampling schemes, Joep van Esdonk for help with selection of survey-invitees and Marianne van der Sande for input on study design and revision of the paper. The authors also wish to sincerely thank the anonymous reviewers whose constructive comments were very helpful and improved the manuscript.

Authors K.E.G. was responsible for data analysis and writing the paper. All other authors are part of the CSI Project Group, which is the group involved in the conception and design of the Chlamydia screening. I.V.F.B. and E.L.M.C. developed the methodology of the survey, performed repeated selection of invitees and sent out questionnaires; supervised data analysis and writing. Other authors were involved in the roll-out of the program (including data acquisition) and contributed to drafting and revision of the paper. J.B. and L.L.P. were responsible for the coordination of the screening in the 3 regions; C.J.P.A.H. and E.E.H.G.B., for the screening in South Limburg, H.J.F. and R.H.K. in Amsterdam, and H.M.G. and S.M.V.R. in Rotterdam.

The evaluation of the Chlamydia screening is being carried out by request of the Ministry of Health, Welfare and Sport, and is supported by the STI program at the Centre for Infectious Disease Control (grant V/210261/01/IE "Interventie en Evaluatieonderzoek").

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Received for publication March 9, 2010, and accepted October 28, 2010.
DOI: 10.1097/OLQ.0b013e318204546e

Screening for the sexually transmitted infection (STI) *Chlamydia trachomatis* (chlamydia) aims to detect and treat prevalent cases, prevent sequelae, and control transmission.[1,2] Screening programs are country-dependent and based on the local epidemiology and burden of disease.[3–5] In the Netherlands, 60,000 chlamydial infections are estimated to occur each year.[6] A 2003 pilot study[7,8] helped shape recommendations to trial selective, systematic internet-based chlamydia screening in the Netherlands. The Chlamydia Screening Implementation (CSI) program aims to determine whether and how to roll-out a national chlamydia screening.

The first screening round of the 2-year CSI program was implemented in Amsterdam, Rotterdam, and South-Limburg between April 2008 and March 2009. In urban Amsterdam and Rotterdam, all sexually active individuals were invited to test, whereas in the more rural South-Limburg, where prevalence is lower,[7] people were deemed eligible based on their risk-score in an online prescreening questionnaire.[9,9a] All 16 to 29 year old participants (n = 261,023) identified by municipal registries received postal invitations during the first screening round. Invitation letters containing personal log-in codes granted access to the screening website (available at: http://www.chlamydiatest.nl), through which 20% of invitees requested a swab (default for

women) or urine test packet. Overall, 41,638 individuals (participation rate = 16%) posted samples to the laboratory and viewed test results via the website.[10] The chlamydia positivity rate was 4.2%.[9]

Large-scale systematic, internet-based screening is a novel approach, the success of which depends on the response rate. Evaluation of the feasibility and effectiveness of the program can provide insight to improve the screening process. We investigated the acceptability and usability of the screening method for participants and their motivations for participation. We also aimed to assess major reasons for nonresponse and factors related to nonresponse. This article reports the findings from the first year (first round) of the screening.

MATERIALS AND METHODS

Acceptability Survey

A random sample of 4000 screening participants was selected from the 21,299 (51%) screening participants who provided informed consent and an email address. The sample was selected periodically throughout the first screening round by randomizing client identification numbers of participants who had viewed their results online at least 2 weeks earlier. We oversampled specific groups when we expected the random sample to yield too few individuals to allow for subgroup analysis. These groups were as follows: those invited by general practitioners instead of the municipal health service (small study investigating how receptive people were to different modes of invitation); South-Limburgers (small proportion of screening invitees); Surinamese/Antilleans (known STI risk group with expected low response rate); and chlamydia positives (small group). In total, 5590 screening participants were invited to the acceptability survey by an email, which contained a direct link to an online questionnaire administered through an internet-based program (Questback, Oslo, Norway); reminders were sent after 10 days. The questionnaire enquired into background knowledge, reasons for participation, opinions about the screening and their experiences, and future willingness to test.

Nonresponse Survey

Postal questionnaires (email addresses were not available) were sent every 2 weeks during the screening round to a predetermined number of randomly selected nonparticipants (total = 10,000) who had not responded to the postal invitation or reminder letter in the previous 12 weeks. Specific groups were again oversampled (as above, except chlamydia positives), bringing the total number of postal invitations to 13,976. All nonparticipants were asked their reason for declining the offer of screening. Sexually active nonparticipants answered the whole questionnaire, including topics addressed by the acceptability questionnaire, information on access to the internet, and sexual behavior questions.

Statistical Analysis

The Questback database was downloaded from the password-protected website into Statistical Package for the Social Sciences (SPSS) 17.0. Paper questionnaires for the nonresponse survey were scanned and transported into an SPSS database. Questions with a scaled response were recategorized into 2 groups to capture magnitude of agreement: strongly agreed/agreed versus neutral/disagreed/strongly disagreed. Considering they did not participate in the screening, scaled questions relating to agreement were negatively phrased for nonparticipants. Nonparticipants who (strongly) disagreed were compared with participants who (strongly) agreed. Both databases were linked to demographic data obtained from municipal registries, laboratory data with chlamydia test results, and variables on sexual behavior and education from a questionnaire completed by 83% of acceptability survey participants during screening.

Each individual in the nonresponse and acceptability surveys was assigned a weight to (1) correct for differential selection probabilities introduced by oversampling (sampling weight) and (2) to account for differences in the age/gender profile between the achieved sample and the survey population (nonresponse weight). Weights were calculated by taking the inverse of the probability of an individual ending up in the final sample. The probability was calculated by first creating a matrix with all the different possible strata combinations (including age and sex as well as the oversampled groups) and then dividing the number of survey respondents in each stratum by the total number of screening participants (acceptability study) and nonparticipants (nonresponse survey) in the same stratum. Data analysis was conducted in Stata 10 using the complex survey function to account for the weighting. Weighted estimates of proportions obtained in subgroup analysis of key variables were compared using a 2-sample test of proportions. Explanatory variables associated with future willingness to test at the $P < 0.2$ level in univariate analysis were included in the multivariate logistic regression model. With the exception of Table 1, all proportions presented in this article are weighted population estimates.

RESULTS

Study Population

The response rate was 63% (3508/5590) in the acceptability survey and 15% (2060/13,976) in the nonresponse survey. After linking databases, 3499 acceptability and 2053 nonresponse questionnaires could be analyzed. Acceptability survey participants were predominantly female and Dutch, with similar age distribution to screening participants (Table 1). Nonresponse survey respondents were comparable to screening nonparticipants for major characteristics except oversampled groups. Response rates were highest among young Dutch women (Table 1). In all, 70% of participants and 58% of nonparticipants had higher (postcompulsory) education.

Participants' recollections of who had invited them to the screening (General Practitioner or Municipal Health Service) were discrepant with invitation records; therefore, further analysis related to this question was not done.

Acceptability Survey

Motivation for Participation. Participants, presented with a list of 4 options regarding their motivation for testing, most commonly participated for their own health (Table 2); especially women, chlamydia positives, and those of non-Dutch ethnic background (68% vs. 62% Dutch, $P < 0.001$). A total of 956 (corresponding to a weighted proportion of 28% of participants) participated out of curiosity, 45 (2%) at their partner or family's request, and the remaining 7% for other reasons, two-thirds of whom reported they participated to support the research.

Experience With Home-Testing Kits. Participants were very positive about self-sampling at home: 94% agreed that packaging the sample for posting was easy, 92% agreed

TABLE 1. Demographics and Response Rates of Acceptability and Nonresponse Survey Participants

	Acceptability Survey Participants (N = 3499)			Nonresponse Survey Participants (N = 2053)		
	n (%) of Screening Participants (N = 41,638)	n (%) of Study Population	Response Rate (% of Study Invitees)	n (%) of Screening Nonparticipants (N = 207,124)	n (%) of Study Population	Response Rate (% of Study Invitees)
Sex						
Male	13,020 (31.3)	828 (23.7)	54.8	106,630 (51.5)	842 (41.0)	11.7
Female	28,618 (68.7)	2671 (76.3)	65.8	100,494 (48.5)	1211 (59.0)	18.5
Age*						
16–19	5510 (13.2)	488 (14.0)	61.0	47,821 (23.1)	665 (32.3)	19.8
20–24	15,752 (37.9)	1317 (37.7)	60.0	74,732 (36.1)	642 (31.3)	12.9
25–29	20,355 (48.9)	1692 (48.4)	65.7	84,447 (40.8)	743 (36.2)	13.8
Ethnic background†						
Dutch	26,43 1 (63.8)	2428 (69.4)	65.6	93,698 (45.2)	1178 (57.4)	18.7
Turkish/Moroccan/North African	2360 (5.7)	84 (2.4)	48.0	39,489 (19.1)	213 (10.4)	10.4
Surinamese/Antillean	4367 (10.5)	429 (12.3)	59.9	22,913 (11.1)	250 (12.2)	11.0
Other European	3058 (7.3)	206 (5.9)	58.4	17,718 (8.6)	157 (7.6)	13.5
Other	5422 (13.0)	318 (9.1)	50.8	33,306 (16.1)	233 (11.3)	12.7
Region						
South-Limburg	1450 (3.5)	259 (7.4)	62.0	10,194 (4.9)	504 (24.5)	21.4
Amsterdam	23,827 (57.2)	1846 (52.8)	63.4	109,921 (53.1)	655 (31.9)	11.4
Rotterdam	16,361 (39.3)	1394 (39.8)	61.6	87,009 (42.0)	894 (43.5)	16.1
Invited by						
General Practitioner‡	999 (2.4)	166 (4.7)	67.5	4509 (2.2)	100 (4.9)	11.5
Municipal Health Service	40,639 (97.6)	3333 (95.3)	62.6	202,615 (97.8)	1953 (95.1)	8.2
Test result (n = 41,554)§						
Chlamydia negative	39,796 (95.6)	3238 (92.5)	62.8	—	—	—
Chlamydia positive	1758 (4.2)	261 (7.5)	62.7	—	—	—

Population percentages do not always sum to 100% due to rounding. Nonparticipants excludes noneligble South-Limburgers who completed the prescreening questionnaire.
Populations oversampled in the acceptability and nonresponse surveys: Surinamese and Antillean, South-Limburgers, General Practitioner invitees and chlamydia positives (acceptability study only).
*Denominators vary due to missing data.
†Ethnic background categorized according to national criteria based on the individuals country of birth and the parents' countries of origin.
‡Small parallel study conducted in Amsterdam only.
§Some results were indeterminate/unknown.

TABLE 2. Participants' Motivations for Participation and Experiences With the Internet-Based Aspects of the Screening

	% of Men (N = 828)	% of Women (N = 2671)	*P*	% of Chlamydia Positives (N = 261)	% of Chlamydia Negatives (N = 3238)	*P*
Main reason for participation						
Health	56.9	66.2	<0.001	75.0	62.9	<0.001
Curiosity	32.8	25.3	<0.001	20.7	27.9	<0.001
Other*	10.2	8.6	<0.001	4.3	9.3	<0.001
Receiving results by internet						
Very good	76.8	76.5	0.502	83.7	76.3	<0.001
Good	19.4	19.6	0.551	12.8	19.9	<0.001
Other†	3.8	3.9	0.805	3.5	3.8	0.534
Perception of result waiting time						
Good/acceptable	97.8	97.9	0.644	92.0	98.1	<0.001
Too long	2.1	2.1	0.692	8.0	1.9	<0.001
Reaction to test result						
Shocked/disbelieving	2.6	4.8	<0.001	81.2	1.2	<0.001
Relieved	55.1	61.4	<0.001	18.5	61.1	<0.001
Happy to have participated	85.8	89.3	<0.001	97.8	87.9	<0.001
Concerned about health	10.7	12.6	<0.001	75.9	9.6	<0.001

All percentages reported are weighted to account for the sampling design.
All questions consisted of multiple choice responses from which participants selected the most applicable option. More than one answer was possible for reaction to test result.
*Includes "my partner or my family found it important" (n = 45) and other, open text responses (n = 254).
†Includes "annoying, would have preferred personal contact" (n = 13), "troublesome, not private enough" (n = 27) and other, open text responses (n = 95).

that instructions for use were clear, and 89% agreed that the method was easy to use. Opinions varied little between men and women and different ethnic groups. Nearly all women (96%) participated using the default vaginal swab kit. Turkish women opting for the urine kit more commonly found vaginal swabs "unpleasant" than other urine test kit users (73% vs. 42%, $P < 0.001$). Women found swab kits easier to use than urine kits (94% vs. 85%, $P < 0.001$).

Opinion on the Use of the Internet and Receiving Test Results. Almost all participants (98%) accessed the website without a problem. Table 2 shows the experiences of participants with the internet-based screening method. Altogether, 96% of participants found it "(very) good" to receive results by internet. The other 4% often reported having forgotten their password or would have preferred a telephone call or letter with the results. Despite more often perceiving result waiting time too long (Table 2) and worrisome (40% vs. 10% chlamydia negatives, $P < 0.001$), chlamydia positives were also satisfied with receiving online results (Table 2). Women and men had similar opinions about receipt of results (Table 2). Chlamydia positive participants were frequently shocked or disbelieving of their test result (215/261 = weighted proportion of 81%), yet 98% were happy that they participated (Table 2).

Most participants (93%) shared their results with others. Among people with a steady relationship, 90% told the result to their partners. Chlamydia positives who had a steady partner disclosed their results to their partner as often as chlamydia negatives (89% vs. 90, $P = 0.8$). Although 14% had upsetting conversations, overall 38% reported their partner was understanding, while only 4% said their partner was suspicious or doubted them.

Nonresponse Survey

Reasons for Nonparticipation. Inability to read Dutch prevented 2% of nonresponse survey participants from taking part in the screening. Overall, 27% of reached nonparticipants reported not testing because they had never had sex, the majority of whom (64%) were under 20 years old. The most frequently reported reasons for nonparticipation among sexually active nonparticipants were no self-perceived risk of infection (40%), no time or interest (19%) and having recently tested for chlamydia (16%) (Table 3). Individuals with higher-risk sexual behavior (indicator used: having had 2 or more partners in the last 6 months) less often perceived themselves low risk. The proportion of nonparticipants recently tested or treated for chlamydia was highest in this group (Table 3). Generally, nonparticipants expected to be "high-risk" gave similar responses to other nonparticipants. Men more often reported having no time or interest than women (24% vs. 14%, $P < 0.001$) but were otherwise comparable. Open answer comments (164) most frequently described lost invites, moving, forgetfulness, or pregnancy.

Restricted internet access did not appear to play a major role in nonparticipation (Table 3). Overall, 77% of nonparticipants had internet at home, 13% had access elsewhere, and 10% had no internet access. When asked explicitly, 9% of nonparticipants agreed that lack of privacy to check online results strongly influenced their decision not to participate, this was slightly higher among ethnic minorities (12% vs. 6% Dutch, $P = 0.006$).

Opinion on the Screening Design. In general, the screening invitation was positively received by screening nonparticipants. Only 10% (strongly) agreed the invitation letter was uninviting and 8% that the invitation letter was unclear (Table 3). However, several aspects of the program design were less well received; 26% disliked the idea of posting their sample to the laboratory, 16% disliked the use of the internet and 12% found home-testing an unpleasant concept (Table 3). These feelings were more frequently expressed by demographic and behavioral high-risk groups (Table 3).

TABLE 3. Views of Sexually Active Nonparticipants Including Expected "High-Risk" Groups on the Screening

	% of All Sexually Active Nonparticipants (n = 1263)	% With Non-Dutch Ethnic Background (n = 489)	% Aged 16–19 yr Old (n = 228)	% With Low Education* (n = 487)	% With 2 or More Recent† Sexual Partners (n = 204)
Reported reasons for not participating in the screening					
No perceived risk of infection	40.5	34.3	41.6	36.4	27.7
No time or no interest	18.9	23.7	20.0	26.3	24.4
Recently had a chlamydia test (last 6 mo)	15.9	13.1	11.4	8.7	18.9
No symptoms	4.3	4.4	5.2	4.7	4.1
Treated for chlamydia previously	2.9	3.2	3.5	3.9	5.0
No/limited internet access	2.5	3.2	1.4	3.4	2.6
Didn't understand the invitation	0.7	1.3	2.2	2.1	1.0
Afraid to test/prefer not to know	0.6	1.1	0.5	1.1	0.1
Other‡	13.8	15.7	14.2	13.5	14.9
Opinions on the screening					
The invitation letter did not clearly explain the investigation	7.5	9.9	12.1	10.1	9.5
I found it a disadvantage that I had to participate via the internet	16.4	20.2	26.1	22.8	24.4
I found it unpleasant that I needed to take the test at home	12.1	16.1	15.4	18.1	20.4
I found it unpleasant that I was supposed to post my sample	25.9	32.6	33.4	30.2	37.1

Overall, 1830 nonparticipants accounted for their nonparticipation, of whom 567 individuals reported not being sexually active and are therefore excluded from this table.
Responses to opinions on the screening include those who agreed or strongly agreed with scaled-response statements about the screening procedure versus those who were neutral or (strongly) disagreed.
Denominators vary for opinions on the screening due to missing data, groups are not mutually exclusive.
All percentages reported are weighted to account for the sampling design.
*Primary school only or (enlisted/finished) additional low-grade schooling.
†Two or more sexual partners in the last six months.
‡Includes open text responses, mainly: lost invites, moving, forgetfulness or pregnancy.

Participants' and Nonparticipants' Opinions About the Screening Program

Participants had more often heard about the screening program before receiving the screening invite than nonparticipants (62% vs. 45%). Information sources were mainly friends, school, television, and newspapers. Chlamydia knowledge was high: more than 90% of participants and nonparticipants knew chlamydia is a STI, which can be silently transmitted. Participants were more aware than nonparticipants that condoms prevent infection, that you can become infertile, and that you can get repeated infections. Nonparticipants who perceived themselves not at risk of infection differed from participants; they more frequently had a steady sexual partner (76% vs. 59%), had less often entered a new relationship in the last 2 months (10% vs. 21%) and more commonly had had only 1 sexual partner (if any) in the last 6 months (85% vs. 72%). In all, 60% of participants and 73% of nonparticipants reported a steady sexual partner. Participants more frequently reported a history of STI (34%) than sexually active nonparticipants (9%).

Participants reacted more favorably to the offer of a chlamydia test than nonparticipants, who did not mind being invited but more often found the offer superfluous (Table 4). Participants were more influenced by other people about whether to participate in the screening than nonparticipants. Nonparticipants tended to consult their partners (71% vs. 58% participants), while participants spoke more with friends (62% vs. 49% nonparticipants), reflecting the different personal situations of the 2 groups. Participants were more enthusiastic than nonparticipants about all aspects of the program design; almost all participants agreed that internet usage and self-sampling at home were program strengths, while about half of nonresponders had the same opinion. Nonresponders were least accepting of the request to post the sample (Table 4).

Future Willingness to be Screened

Two-thirds of participants and almost half of nonparticipants would regularly test for chlamydia (Table 4). Of those who were willing or undecided about future chlamydia testing, 92% of participants and 42% of nonparticipants would test in the same manner (via the screening program) (Table 4). Most other nonparticipants would prefer to test with their general practitioner (26%) or at a sexual health clinic (26%). Participants and nonparticipants with 2 or more recent sexual partners had 3 to 4 times higher odds of being interested in future testing than those with one or no recent sexual partner. After adjustment in the multivariate regression model for participants (Table 5), current chlamydia infection, female gender, younger age groups, non-Dutch ethnic background, coming from South Limburg, intermediate or low education level, and 2 or more sexual partners in the last 6 months remained significantly associated with increased willingness to test for chlamydia in the future. Among nonparticipants, past STI, the 20- to 24-year-old age group and non-Dutch ethnic background were significantly associated with increased willingness to test (Table 5). Interaction terms were not included because they did not significantly improve either model.

TABLE 4. Overview of Participants' and Nonparticipants' Opinions About the Screening Program

	Participants (N = 3499) % of Study Population	Nonparticipants N*	Nonparticipants % of Study Population
Reaction to offer of a chlamydia test			
It is great to test in this way	89.0	1288	63.0
I didn't mind being invited	8.2		19.3
I found the offer unnecessary	0.5		10.3
Other	2.3		7.4
Consulted others about the screening			
Discussed the offer with someone	51.5	1172	64.2
Decision to participate influenced by discussion	17.5	1032	7.5
Opinion about the screening procedure†			
Use of the internet was advantageous	93.0	1216	56.0
Self-sampling at home was advantageous	96.9	1206	55.5
There was no problem with being asked to post the sample	91.7	1205	43.9
Opinion about screening in the future			
Willing to be offered a test in the future	66.3	1216	45.6
Willing to test via the screening program in future‡	91.6	873	42.3

All percentages reported are weighted to account for the sampling design.
*Number of nonparticipants who answered the question.
†Participants who agreed/strongly agreed with the affirmative statement; Nonparticipants who disagreed/strongly disagreed with the negatively phrased statement i.e. "use of the internet was a disadvantage of the programme."
‡Among those who said 'yes' or 'don't know' to the offer of a future test.

DISCUSSION

Systematic internet-based CSI in the Netherlands (self-sampling at home and results via the internet) was well-perceived by participants, regardless of test results. This is further corroborated by observing that the majority of participants would test via the program in future. Despite not participating in the screening, and given the limited response of nonparticipants to this survey, two-thirds of nonparticipants reached by the survey were appreciative or neutral about the format, and almost half were open to the prospect of future screening. Participants made informed choices about participation: they were knowledgeable about the screening and chlamydia infection, and primarily participated to benefit their own health. Almost 70% of responding nonparticipants had justified reasons for not participating: not yet sexually active, recently tested for chlamydia, or allegedly not at risk of infection. The accuracy of self-assessed risk perception can be questioned; nevertheless, the self-perceived low risk status of sexually active nonparticipants was, for the majority of cases (87%), supported by their relationship status (long-term, monogamous relationships or no recent sexual contacts), suggesting low-risk nonparticipants may have accurately assessed their risk-status.

The positive attitude of participants and an important proportion of nonparticipants contrast with the low participation rate (16%) in the first screening round.[9,9a,10] The high motivation of South-Limburgers to test again may be a result of their higher-risk status (eligibility criteria). Higher-risk participants and nonparticipants expressed the most desire to test again; however, the majority of screening participants were female, over 20 years old and of Dutch ethnic background. In order to improve participation levels in these groups, it is important to consider how men, adolescents, and other, higher-risk individuals perceived the screening design and why they did not participate. The respondents in our survey with this background were more often "indifferent" toward the screening and more frequently mentioned potential barriers to participation such as internet usage, self-sampling, posting specimens, and the relatively complex information provided. Surprisingly, adolescents were least appreciative of the internet design, possibly because they are the most active internet users, and therefore more suspicious of online services.

The nonresponse survey provides unique insight into the opinions of nonparticipants. Nevertheless, the low response rate of the nonresponse survey is our main study limitation. Due consideration should be given to the potential for selection bias and the consequences thereof. We did not find major differences in demographics between nonresponse survey participants and screening nonparticipants. Nevertheless, selection bias for a more "compliant" group is inevitable. A recent Dutch sexual health survey (response rate, 30%) indicates that the proportion of sexually active 16 to 19 years old in the general population is higher than in the nonresponse survey.[11,12] The nonresponse survey also appears to over represent people with steady partners. This implies that screening nonparticipants with lower risk were more inclined to respond to the nonresponse survey, which may bias the reasons given for nonresponse toward those with a rational reason for not participating. The group without a rational reason, the high-risk nonparticipants, may represent a larger group than our survey suggests, hence their indifferent/negative feelings should be addressed to improve the screening design. Given the inherent difficulty reaching nonparticipants and eliciting their motives for declining screening, the information obtained from both nonparticipants and participants is very useful for evaluation of the screening program and can guide decisions on future control.

In the acceptability study, participants with email addresses and informed consent for further research were selected, potentially introducing selection bias. In order to assess

TABLE 5. Factors Affecting Willingness to be Tested Regularly Among Participants and Nonparticipants

	Participants			Nonparticipants		
	%	Adjusted OR (95% CI)	*P*	%	Adjusted OR (95% CI)	*P*
Chlamydia test result						
Negative/missing	65.6	1.0		N/A	*	
Positive	86.5	2.4 (1.5–3.7)	<0.001			
Ever had an STI[†]						
No	74.1	*		44.2	1.0	
Yes	79.5			61.3	2.2 (1.4–3.7)	0.002
Gender						
Male	60.7	1.0		45.9	1.0	
Female	68.9	1.7 (1.3–2.1)	<0.001	45.2	1.1 (0.8–1.6)	0.406
Age						
25–29 yr	61.9	1.0		40.5	1.0	
20–24 yr	70.4	1.4 (1.2–1.7)	<0.001	51.2	1.4 (1.0–2.0)	0.067
16–19 yr	71.3	1.4 (1.0–1.9)	0.032	48.2	1.1 (0.7–1.8)	0.568
Ethnic background						
Dutch	62.9	1.0		40.0		
Non Dutch	72.3	1.5 (1.2–1.8)	<0.001	51.5	1.5 (1.0–2.0)	0.025
Region						
Rotterdam/Amsterdam	66.1	1.0		46.0	*	
South-Limburg	73.2	1.6 (1.1–2.2)	0.016	38.2		
Education level						
High	63.0	1.0		43.2	1.0	
Intermediate/low	74.3	1.5 (1.2–1.9)	<0.001	50.0	1.3 (0.9–1.8)	0.164
No. sexual partners in last 6 mo[‡]						
None	71.8	1.0		47.5	1.0	
1 steady partner	54.9	0.5 (0.3–0.7)	<0.001	38.4	0.7 (0.4–1.2)	0.204
1 casual partner	75.3	1.3 (0.8–2.4)	0.235	51.6	1.3 (0.6–2.8)	0.497
≥2 partners	84.1	2.2 (1.5–3.4)	<0.001	64.3	2.1 (1.1–4.0)	0.023

All percentages reported are weighted to account for over-sampling and for the sampling design.
Participant model adjusted for test result, gender, age group, ethnic background, region, education level, and number of sexual partners in the last 6 months. Nonparticipant model adjusted for past STI, age group, ethnic background, education level and number of sexual partners in the last 6 months. No interaction terms were used.
*Not included in multivariate model.
[†]Sexually transmitted infection.
[‡]Defined as follows: steady partner, 1 fixed sexual partner in the last 6 months; Casual partner, 1 sexual partner in the last 6 months, not reported to be a fixed sexual partner; ≥2 partners, 2 or more sexual partners in the last six months, one of whom may be a fixed partner.
OR indicates odds ratio; CI, confidence interval.

the whole screening process, acceptability questionnaires were sent after results had been viewed. However, knowledge of chlamydia infection status may have introduced reporting bias, particularly with questions related to receiving results. Another methodological issue is the different phrasing of statements with scaled-responses in the 2 studies. Responses to a negatively phrased statement may not be directly comparable to answers to affirmative statements.

The response rate to the acceptability questionnaire (63%) was higher than that the 50% achieved by an earlier study using telephone interviews to assess acceptability of home-based urine testing.[8] The proportion of participants indicating they would test in future was also more encouraging. The high acceptability of home-based screening among study participants is consistent with previous studies in the Netherlands[8,13–15] and Abroad.[16–18] The response rate to the nonresponse survey was similar to the 11% return rate of nonresponse cards in the pilot study.[7] It remains difficult to increase the response rate given that nonparticipants by nature tend not to respond. In the future, combining focal group discussions or telephone interviews with a postal survey could give more insight into the motivations of specific groups. In line with other findings, men participated less in both studies[7,19,20] and had different motivations to women when they did take part.[21] However, men most commonly reported participating for health reasons, optimistic considering men are not usually as appreciative of screening and are an important target group.[22–24] On the other hand, it is possible that nonparticipating men are motivated less than average by health concerns, and may underestimate their risks.

In conclusion, acceptability and nonresponse surveys showed internet-based chlamydia screening was well perceived among participants and nonparticipants. Both groups appeared to have made informed choices about whether to participate, with lower-risk nonparticipants accurately perceiving their low-risk status. Most participants and a large proportion of

nonparticipants indicated that they would participate in future screening; home-based screening seems to be a good approach. Although there remains a group of nonparticipants not reached by the nonresponse survey, current insights on acceptability and nonresponse will be very valuable in determining the nature of future national screening in the Netherlands. Full evaluation of the implementation program will be conducted after further screening rounds have been completed, including modeling the impact of ongoing screening on population prevalence and a cost-effectiveness evaluation.

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