National Institute for Health and Care Excellence

FINAL

Reducing sexually transmitted infections (STIs)

[C] Effectiveness, acceptability and cost effectiveness of strategies to improve uptake of STI testing

NICE guideline NG221

Evidence reviews underpinning recommendations 1.2.1 to 1.2.9 and research recommendations in the NICE guideline

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Final

National Institute for Health and Care Excellence

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1.1 Review question

What strategies to improve the uptake of STI testing (excluding HIV testing) are effective and cost-effective?

1.1.1 Introduction

Sexually transmitted infections (STIs) can affect personal wellbeing, mental health and relationships and can also lead to serious health problems including pelvic inflammatory disease, ectopic pregnancy or infertility. STI testing, diagnosis and treatment are central to STI prevention strategies. The purpose of this review is to establish which strategies or interventions for increasing the uptake of STI testing are effective and cost effective.

People can use specialist sexual health services without referral or residence requirements. The number of attendances at these services has increased, and service provision varies. Some clinics have closed or reduced their opening hours. Prevention and targeted outreach services have also been cut. Some clinics have fewer consultants or health advisors, and some patients with STI symptoms report finding it more difficult to get appointments within 48 hours.

Examples of innovative services include online access to STI self-sampling kits with results sent by text message, and being able to make test appointments through the web or a phone app. The National Chlamydia Screening Programme has seen a 22% decrease in tests from 2014 to 2018, but an increase in the proportion of people testing positive over the same time period. The aim of this review is to determine the effectiveness and cost-effectiveness of such strategies.

1.1.2 Summary of the protocol

Table 1: PICO inclusion criteria

Eligibility criteria	Content
Population	Sexually active people from age 16. This will include younger people who contact or use sexual health services and are considered to be Gillick competent and satisfies the Fraser guidelines (able to consent)
Interventions	Interventions or strategies that have a stated primary aim of improving the uptake of STI testing (excluding HIV testing), including but not limited to: Healthcare settings • Opportunistic STI testing during healthcare consultations that are not specifically related to sexual health • Opportunistic testing within reproductive health and termination of pregnancy services • STI point of care tests, including rapid turnaround diagnostics • Education based interventions • Email invites for testing • Text messaging invites for testing

Eligibility criteria	Content
	• Changes in service provision and delivery that may improve access to sexual health services and testing accessibility such as reduced waiting times, extended clinic opening hours, walk-in clinics, short notice appointments, appointment booking systems, and whether services meet 'You're Welcome' youth friendly quality criteria. • Testing services delivered in spoke or satellite clinics. • Remote service delivery or telephone and/or video consultations (e.g. Skype, GP at Hand, PushDoctor, Dr Thom) Non healthcare settings • Online testing services • STI self-sampling and/or self-testing kits • Testing services delivered in non-clinical community settings such as voluntary or community organisations or in prisons • Testing services delivered in outreach settings such as bars, clubs, faith-based settings, saunas, sex on premises venues • Social media invites or advertisements for STI testing (including dating apps and 'influencers')
Comparator	• Another intervention • No intervention
Outcomes	Primary outcomes • Uptake of STI testing Secondary outcomes • Safety or adverse effects • Unintended consequences (e.g. availability of STI testing appointments, waiting time for diagnosis and/or treatment) • Awareness of STI testing and testing services • Changing STI diagnosis rate • The number of people at risk who intend to have an STI test • Condom use

For the full review protocol see appendix A.

1.1.3 Methods and process

This evidence review was developed using the methods and process described in Developing NICE guidelines: the manual. Methods specific to this review question are described in the review protocol in appendix A and the methods document.

Declarations of interest

Declarations of interest were recorded according to NICE's conflicts of interest policy.

1.1.4 Effectiveness evidence

1.1.4.1 Included studies

5,673 references were initially identified from the literature search. 113 quantitative papers were ordered in full-text. Of these, 19 quantitative studies met the inclusion criteria for the effectiveness review as outlined in the review protocol.

1.1.4.2 Excluded studies

Details of excluded studies can be found in appendix J along with reasons for their exclusion.

1.1.5 Summary of studies included in the effectiveness evidence

Table 2: Included effectiveness studies

Study	Country	Setting	N	Population	Intervention	Comparator	Follow up	Outcomes
Self-sampling kits								
Klovstad (2013)	Norway	Regional population	41,519	Young people aged 18-25	Home test kit sent by mail	Usual care available at clinics	Within 3 months	Number of STI tests, STIs detected, treatment received
Reagan (2012)	USA	Homes and clinics	200	Men	Home based STI screening	Clinic based STI screening	10-12 weeks	Intervention Acceptability, attitude towards STI testing, STIs detected
Smith (2015)	Australia	Homes and clinics	600	Women, heterosexual men, MSM	The addition of a postal home collection kit to a SMS reminder to re-test	SMS reminder to return to clinic	1-4 months	Number of STI tests, STIs detected
Van den Broek (2012)	The Netherlands	Regional population	421,820	Young people aged 16-29	Postal invitations to use an internet site to request a home test kit	Usual care available at clinics	6 months	Number of STI tests, STIs detected
Wilson (2017, 2019)	UK	Online	2063	Adults	SMS with link to e-STI testing site to request a home test kit	SMS with link to clinic testing	6 weeks	Intervention Acceptability, STI Testing Behaviour, STIs detected, treatment received, engagement with the program, speed of test results

Study	Country	Setting	N	Population	Intervention	Comparator	Follow up	Outcomes
Xu (2011), 2 trials reported in single paper	USA	Homes and clinics	811 and 404	Women	Home test kit mailed to participant's home	A clinic appointment was scheduled for rescreening	3 months	STI Testing Behaviour, rescreening within a 7-week window, STIs detected
Interventions to increase motivation to test								
Booth (2014)	UK	Further education colleges	253	Young people living in deprived areas	A brief intervention based on the theory of planned behaviour and self-identity	Usual chlamydia testing promotion	No follow up	STI Testing Behaviour, number of tests taken, STI testing intention, attitude towards STI testing
Fuller (2015)	UK	Amateur football clubs	153	Men in football clubs	A poster and a standardised brief screening promotion talk given by 1. The team captain 2. A healthcare professional	Poster-only screening promotion	Up to 4 weeks	Number of STI tests, STIs detected
Lim (2012)	Australia	Online and via SMS	994	Young people aged 16-29	Regular sexual health promotion messages via email and SMS	No emails or SMS messages	3 months, 6 months, and 12 months	Intervention Acceptability, STI Testing Behaviour, condom use, STI knowledge, speaking to a health practitioner about STIs

Study	Country	Setting	N	Population	Intervention	Comparator	Follow up	Outcomes
Roth (2015)	USA	Community court	143	female defendants	Gain framed messages and loss framed messages to offer a rapid chlamydia test	Neutral message to offer a rapid chlamydia test	No follow up	Attitude towards STI testing, STI knowledge
Tailored interventions to increase STI testing								
Bauermeister (2015)	USA	Online	104	Young men who have sex with men	Tailored intervention using YMSMs psychosocial data to personalise website content	Non-tailored access to online provider directory page	30 days	Intervention Acceptability, STI Testing Behaviour, changes in sexual behaviour, self efficacy towards STI testing
Kang (2012)	Australia	Online	704	Young people aged 16-25	Personalised emails from a clinician (sexual health nurse or doctor)	Impersonal email sent from the project mailbox	6 months	STI Testing Behaviour, changes in sexual behaviour, attitude towards STI testing, number of STI tests, condom use, STI knowledge
Lustria (2016)	USA	University	1065	Adults	Tailored persuasive website content based on responses to a STD risk assessment	General information about STDs taken from the CDC website	No follow up	Intervention Acceptability, STI Testing Behaviour, STI testing intention, attitude towards STI testing
Mevissen (2011)	Netherlands	Universities and higher vocational	218	Heterosexual young adults	Personalised safe sex advice with a virtual consultant	No intervention	3 months	Condom use STI testing

Study	Country	Setting	N	Population	Intervention	Comparator	Follow up	Outcomes
		training colleges						
Mortimer (2015)	Australia	University	747	Young people aged 18-29	Access to online personally controlled health management system	No access	Varied (October 2013, regardless of recruitment date)	STI Testing Behaviour, STI testing intention, attitude towards STI testing, speaking to a health practitioner about STIs
Financial incentives								
Dolan (2014)	UK	Online	2988	Young people aged 16-24	Five types of incentives to return specimens: 1. reward vouchers of differing values, 2.charity donation, 3. participation in a lottery, 4. choices between a lottery and a voucher, and 5. including vouchers of differing values in the test kit prior to specimen return.	No incentive provided, usual care	30 days	Number of STI tests, specimen return rate
Niza (2014)	UK	University halls of residence	1060	Young people living in student halls	Incentive offered in the form of either a £5 voucher or a £200 lottery	No incentive offered	Not provided	Number of STI tests
Computer assisted interview for increasing uptake of STI testing within sexual health clinics								
Richens (2010)	UK	Sexual health clinics	2351	Adults	1. Computer-assisted self-interview (CASI), using a tablet (touchscreen)	Pen and paper interview (PAPI) with a clinician following the normal clinic practice of completing a	No follow up	STI Testing Behaviour, number of STI tests, STIs detected,

Study	Country	Setting	N	Population	Intervention	Comparator	Follow up	Outcomes
					computer in private. 2. Computer-assisted personal interview (CAPI), patient and clinician viewing the screen together	proforma with the patient (usual care)		referral to health counsellors, identification of contraceptive needs, disclosure of sexual history

See appendix D for full evidence tables.

1.1.6 Summary of the effectiveness evidence

Note: 4 studies (Booth 2014, Kang 2012, Dolan 2014 and Niza 2014) reported some outcomes in a way that could be assessed using GRADE. Evidence statements for these findings are included in section 1.1.11.

Table 3 - Remote self sampling compared to clinic tests for Increasing uptake of STI testing

Remote self sampling compared to clinic tests for Increasing uptake of STI testing

Patient or population: patients with Increasing uptake of STI testing
Settings: non-clinical settings
Intervention: Remote self sampling
Comparison: clinic tests

Outcomes	Absolute risk		Relative effect (95% CI)	No of Participants (studies)	Quality of the evidence (GRADE)
Tests taken number of participants who completed STI testing	**Study population**		**RR 1.93** (1.09 to 3.43)	362901 (6 studies[1,2,3,4,5,6])	⊕⊖⊖⊖ **very low**[7,8, 12]
	88 more per 1000 (from 9 more to 231 more)				
Tests taken - Large population studies number of participants who completed STI testing	**Study population**		**RR 2.46** (0.65 to 9.35)	358823 (2 studies[1,4])	⊕⊖⊖⊖ **very low**[7,9,10, 14]
	134 more per 1000 (from 32 fewer to 766 more)				
Tests taken - Sample studies number of participants who completed STI testing	**Study population**		**RR 1.76** (1.36 to 2.27)	4078 (4 studies[2,3,5,6])	⊕⊖⊖⊖ **very low**[7,11]
	224 per 1000	**395 per 1000** (305 to 509)			
STIs detected number of positive results	**Study population**		**RR 1.71** (1.13 to 2.57)	362901 (6 studies[1,2,3,4,5,6])	⊕⊖⊖⊖ **very low**[7,8,12]
	5 per 1000	**9 per 1000** (6 to 14)			
	Moderate				
	30 per 1000	**51 per 1000** (34 to 77)			
STIs detected - Large population studies number of positive results	**Study population**		**RR 1.79** (0.85 to 3.79)	358823 (2 studies[1,4])	⊕⊖⊖⊖ **very low**[7,9,10, 14]
	5 per 1000	**9 per 1000** (4 to 19)			
	Moderate				
	5 per 1000	**9 per 1000** (4 to 19)			
STIs detected - Sample studies number of positive results	**Study population**		**RR 1.64** (1.04 to 2.6)	4078 (4 studies[2,3,5,6])	⊕⊖⊖⊖ **very low**[7, 11,12]
	24 per 1000	**40 per 1000** (25 to 64)			
	Moderate				
	39 per 1000	**64 per 1000** (41 to 101)			
STIs diagnosed from tests taken number of positive results	**Study population**		**RR 0.84** (0.6 to 1.18)	53648 (6 studies[1,2,3,4,5,6])	⊕⊖⊖⊖ **very low**[7,8,12]
	57 per 1000	**48 per 1000** (34 to 67)			
	Moderate				
	103 per 1000	**87 per 1000** (62 to 122)			

STIs diagnosed from tests taken - Large population studies number of positive results	**Study population**		**RR 0.74** (0.41 to 1.34)	52306 (2 studies[1,4])	⊕⊖⊖⊖ **very low**[7,9,10, 12]
	54 per 1000	**40 per 1000** (22 to 72)			
	Moderate				
	80 per 1000	**59 per 1000** (33 to 107)			
STIs diagnosed from tests taken - Sample studies number of positive results	**Study population**		**RR 0.94** (0.64 to 1.38)	1342 (4 studies[2,3,5,6])	⊕⊖⊖⊖ **very low**[11, 13, 14]
	109 per 1000	**103 per 1000** (70 to 151)			
	Moderate				
	103 per 1000	**97 per 1000** (66 to 142)			

*The basis for the **assumed risk** (e.g. the median control group risk across studies) is provided in footnotes. The **corresponding risk** (and its 95% confidence interval) is based on the assumed risk in the comparison group and the **relative effect** of the intervention (and its 95% CI).

CI: Confidence interval; **RR:** Risk ratio;

GRADE Working Group grades of evidence
High quality: Further research is very unlikely to change our confidence in the estimate of effect.
Moderate quality: Further research is likely to have an important impact on our confidence in the estimate of effect and may change the estimate.
Low quality: Further research is very likely to have an important impact on our confidence in the estimate of effect and is likely to change the estimate.
Very low quality: We are very uncertain about the estimate.

[1] Klovstad 2013
[2] Reagan 2012
[3] Smith 2015
[4] Van den Broek 2012
[5] Wilson 2017 & 2019
[6] Xu 2011
[7] Downgraded twice because of significant heterogeneity (I^2 > 75%)
[8] Downgraded twice for 2 indirectly applicable studies and 3 partially appliable studies
[9] Downgraded twice for 1 study with high risk of bias and 1 study with some concerns
[10] Downgraded twice for 1 indirectly applicable study and 1 partially appliable study
[11] Downgraded once for 2 partially applicable studies and 1 indirectly applicable study
[12] Downgraded once for crossing one MID/lone of no effect
[13] Downgraded once for inconsistency i^2 > 50%
[14] Downgraded twice for crossing two MIDs

Table 4: Motivation for Increasing uptake of STI testing compared to standard promotion

Motivation for Increasing uptake of STI testing compared to standard promotion

Patient or population: patients with Increasing uptake of STI testing
Setting: non-clinical settings
Intervention: Motivation
Comparison: standard promotion

Outcomes	Illustrative comparative risks* (95% CI) Assumed risk **Control**	Corresponding risk **Motivation**	Relative effect (95% CI)	No of Participants (studies)	Quality of the evidence (GRADE)
Tests number of participants who completed STI testing	**Study population**		**RR 1.06** (0.89 to 1.26)	756 (3 studies[1,2,3])	⊕⊖⊖⊖ **very low**[4,5]
	266 per 1000	**282 per 1000** (237 to 336)			
	Moderate				
	615 per 1000	**652 per 1000** (547 to 775)			
Tests - Cluster trials number of participants who	**Study population**		**RR 0.95** (0.71 to 1.28)	154 (1 study[1])	⊕⊖⊖⊖ **very low**[6, 10]
	615 per 1000	**585 per 1000** (437 to 788)			
	Moderate				

completed STI testing	**615 per 1000**	**584 per 1000** (437 to 787)			
Tests - RCTs number of participants who completed STI testing	**Study population**		**RR 1.14** (0.91 to 1.42)	602 (2 studies[2,3])	⊕⊖⊖⊖ **very low**[5,7]
	203 per 1000	**231 per 1000** (185 to 288)			
	Moderate				
	636 per 1000	**725 per 1000** (579 to 903)			
Intention to get tested 7 point scale. Scale from: 1 to 7.	The mean intention to get tested in the control groups was **0**	The mean intention to get tested in the intervention groups was **0.42 higher** (0.84 lower to 0 higher)		253 (1 study[8])	⊕⊕⊕⊖ **moderate**[9]
Attitude towards testing 7 point scale. Scale from: 1 to 7.		The mean attitude towards testing in the intervention groups was **0.42 higher** (0.72 to 0.12 higher)		253 (1 study[8])	⊕⊕⊕⊖ **moderate**[9]
Condom use number of 'always' responses Follow-up: 6 months	**Study population**		**RR 0.71** (0.44 to 1.16)	459 (1 study[2])	⊕⊖⊖⊖ **very low**[5,6]
	124 per 1000	**0 per 1000** (0 to 0)			
	Moderate				
Contact with a sexual health clinician Follow-up: 6 months	**Study population**		**RR 1.16** (0.83 to 1.62)	459 (1 study[2])	⊕⊖⊖⊖ **very low**[5,6]
	211 per 1000	**0 per 1000** (0 to 0)			
	Moderate				

*The basis for the **assumed risk** (e.g. the median control group risk across studies) is provided in footnotes. The **corresponding risk** (and its 95% confidence interval) is based on the assumed risk in the comparison group and the **relative effect** of the intervention (and its 95% CI).

CI: Confidence interval; **RR:** Risk ratio;

GRADE Working Group grades of evidence
High quality: Further research is very unlikely to change our confidence in the estimate of effect.
Moderate quality: Further research is likely to have an important impact on our confidence in the estimate of effect and may change the estimate.
Low quality: Further research is very likely to have an important impact on our confidence in the estimate of effect and is likely to change the estimate.
Very low quality: We are very uncertain about the estimate.

[1] Fuller 2014
[2] Lim 2010
[3] Roth 2015
[4] Downgraded twice for 2 studies with high risk of bias
[5] Downgraded once for crossing one MID/line of no effect
[6] Downgraded twice because all studies are high risk of bias
[7] Downgraded once for one study with high risk of bias
[8] Booth 2014
[9] Downgraded once because study indirectly applicable
[10] Downgraded twice for crossing both MIDs

Table 5: Tailored interventions compared to non-tailored intervention for increasing uptake of STI testing

Tailored interventions compared to non-tailored intervention for increasing uptake of STI testing

Patient or population: patients with Increasing uptake of STI testing
Settings: non-clinical settings
Intervention: Tailoring
Comparison: non-tailored interventions

Outcomes	Illustrative comparative risks* (95% CI)		Relative effect (95% CI)	No of Participants (studies)	Quality of the evidence (GRADE)	Comments
	Assumed risk	Corresponding risk				

	Control	Tailoring			
Tests number of participants who completed STI testing	**Study population**		**RR 1.38** (1.16 to 1.63)	1882 (4 studies[1,2,3,4])	⊕⊖⊖⊖ **very low**[5,6,7]
	195 per 1000	**268 per 1000** (226 to 317)			
	Moderate				
	190 per 1000	**262 per 1000** (220 to 310)			
Intention to get tested mean survey responses Follow-up: 0-3 months		The mean intention to get tested in the intervention groups was **0.34 higher** (0.2 to 0.48 higher)		1177 (2 studies[2,8])	⊕⊕⊖⊖ **low**[9,10]
Intention to get tested number who answered yes Follow-up: 2-6 months	**Study population**		Not estimable	375 (1 study[1])	⊕⊕⊕⊖ **moderate**[11]
	124 per 1000	**0 per 1000** (0 to 0)			
	Moderate				
Attitude towards testing number who answered that testing is relevant Follow-up: 2-6 months	**Study population**		Not estimable	375 (1 study[1])	⊕⊕⊕⊖ **moderate**[11]
	182 per 1000	**0 per 1000** (0 to 0)			
	Moderate				
Attitude towards testing mean survey responses. Scale from: 1 to 5.		The mean attitude towards testing in the intervention groups was **0.4 higher** (0.23 to 0.31 higher)		112 (1 study[8])	⊕⊕⊕⊖ **moderate**[11]
Condom use mean survey responses. Scale from: 0 to 2. Follow-up: 3 months		The mean condom use in the intervention groups was **0.26 higher** (0.04 to 0.56 higher)		78 (1 study[8])	⊕⊕⊕⊖ **moderate**[11]
Contact with sexual health clinician number who answered yes Follow-up: 2-6 months	**Study population**		**RR 1.6** (1.1 to 2.4)	375 (1 study[1])	⊕⊕⊖⊖ **low**[11,12]
	187 per 1000	**299 per 1000** (205 to 448)			
	Moderate				

*The basis for the **assumed risk** (e.g. the median control group risk across studies) is provided in footnotes. The **corresponding risk** (and its 95% confidence interval) is based on the assumed risk in the comparison group and the **relative effect** of the intervention (and its 95% CI).

CI: Confidence interval; **RR:** Risk ratio;

GRADE Working Group grades of evidence
High quality: Further research is very unlikely to change our confidence in the estimate of effect.
Moderate quality: Further research is likely to have an important impact on our confidence in the estimate of effect and may change the estimate.
Low quality: Further research is very likely to have an important impact on our confidence in the estimate of effect and is likely to change the estimate.
Very low quality: We are very uncertain about the estimate.

[1] Mortimer 2014
[2] Lustria 2016
[3] Kang 2012
[4] Bauermeister 2015
[5] Downgraded once for 3 studies with some concerns and 1 study with high risk of bias
[6] Downgraded once for 1 partially applicable study and 1 indirectly applicable study
[7] Downgraded once for confidence intervals that cross the line of no effect
[8] Mevission 2014
[9] Downgraded once because both studies have some concerns for risk of bias
[10] Downgraded once for large confidence intervals that cross the line of no effect
[11] Downgraded once for some concerns about risk of bias
[12] Downgraded once for large confidence intervals

Table 6: Computer assisted interview clinic interventions compared to standard pen and paper interviews for increase in uptake of STI testing

Clinic interventions for Increasing uptake of STI testing

Patient or population: patients with Increasing uptake of STI testing
Settings: clinical
Intervention: Computer assisted interview interventions
Comparison: Standard pen and paper interview

Outcomes	Illustrative comparative risks* (95% CI)		Relative effect (95% CI)	No of Participants (studies)	Quality of the evidence (GRADE)	Comments
	Assumed risk Control	Corresponding risk Clinic interventions				
Number of tests completed number of participants who completed STI testing	**Study population**		**RR 0.99** (0.97 to 1.01)	2319 (1 study[1])	⊕⊕⊖⊖ **low**[2,3]	
	946 per 1000	**937 per 1000** (918 to 956)				
	Moderate					
	946 per 1000	**937 per 1000** (918 to 955)				
Positive results number of participants with positive STI results	**Study population**		**RR 1.05** (0.82 to 1.36)	2319 (1 study)	⊕⊖⊖⊖ **very low**[2,4]	
	100 per 1000	**105 per 1000** (82 to 136)				
	Moderate					
	100 per 1000	**105 per 1000** (82 to 136)				

*The basis for the **assumed risk** (e.g. the median control group risk across studies) is provided in footnotes. The **corresponding risk** (and its 95% confidence interval) is based on the assumed risk in the comparison group and the **relative effect** of the intervention (and its 95% CI).

CI: Confidence interval; **RR:** Risk ratio;

GRADE Working Group grades of evidence
High quality: Further research is very unlikely to change our confidence in the estimate of effect.
Moderate quality: Further research is likely to have an important impact on our confidence in the estimate of effect and may change the estimate.
Low quality: Further research is very likely to have an important impact on our confidence in the estimate of effect and is likely to change the estimate.
Very low quality: We are very uncertain about the estimate.

[1] Richens (2011)
[2] Downgraded once for risk of bias for all studies having some concerns
[3] Downgraded once for confidence intervals crossing the line of no effect
[4] Downgraded twice, once for large confidence intervals and once for confidence intervals crossing the line of no effect

See appendix F for full GRADE Tables.

1.1.7 Economic evidence

A search for published cost-effectiveness evidence was carried out for this review question. In total, 1,600 records were assessed against eligibility criteria. Of these, 1,506 records were assessed as being ineligible based on disease, intervention and study design and 25 records were excluded based on information in the title and abstract. Two reviewers assessed all the records. The level of agreement between the two reviewers was 100%.

The full-text papers of 69 documents were retrieved and assessed. 59 were excluded, for reasons summarised in Appendix G and further detailed in Appendix J.

1.1.7.1 Included studies

Of the 10 included studies, four were assessed as fully meeting the eligibility criteria and underwent a full data extraction. The remaining six studies partially met the inclusion criteria. Data extraction from these remaining six studies was limited to information that could be used to inform the decision problem. Two reviewers assessed all full-text papers. The level of agreement between the two reviewers was 100%.

The study selection process can be found in Appendix G and the economic evidence tables can be found in Appendix H.

1.1.7.2 Excluded studies

59 full text documents were excluded for this guideline. The documents and the reasons for their exclusion are listed in Appendix J.

1.1.8 Summary of included economic evidence

Table 8:

Study	Limitations	Applicability	Other comments	Incremental			Uncertainty
				Costs	Effects	Cost-effectiveness	
Bracebridge (2012) Cost-effectiveness evaluation of a chlamydia trachomatis screening service using global dispatch of testing kits, web-based data collection and test reporting, and treatment dispatch by post.	Minor limitations[a]	Applicable	**Study description** Evaluation of a cross-sectional study by NEEPCT;1 year time horizon; no discounting; NHS perspective; comparator was NCSP.	**Probabilistic results** **Cost of screening and partner notification for NEEPCT with set up costs (£):** 268,198 **Cost of screening and partner notification for NEEPCT without set up costs (£):** 238,686 **Cost of screening and partner notification for NCSP (£):** 46,300,000	**Probabilistic results** **Number screened and diagnosed (%):** **NEEPCT:** 152 (4.4) **NCSP:** 72,570 (7.4) **Number of partners notified:** **NEEPCT:** 26 **NCSP:** 29028 **Partner notification efficacy:** **NEEPCT**: 0.17 **NSCP:** 0.4	**Probabilistic results** The cost per positive diagnosis was higher for the NEEPCT programme (£1,746) compared to the existing NSCP (£506). The cost per screening test and per positive diagnosis are 1.66 and 3.5 times higher for the NEEPCT than the NCSP average, respectively, making NEEPCT not cost-effective when compared with NCSP	Analyses was limited to data on sex, age and Index of Multiple Deprivation (IMD) for the predictors of test uptake. **Reviewer identified:** They used simplistic costing that does not consider factors such as the cost savings from preventing STI transmission.

Study	Limitations	Applicability	Other comments	Incremental			Uncertainty
				Costs	Effects	Cost-effectiveness	
					Test positivity (combined partner and screen): **NEEPCT:** 4.4 **NCSP:** 9		

Abbreviations: IMD: Index of Multiple Deprivation; NCSP: National Chlamydia Screening Programme; NEEPCT: North East Essex Primary Care Trust; NHS: National Health Service;

a. Minor limitations included: the study did not consider cost savings from preventing STI transmission and no sensitivity analysis was conducted.

Study	Limitations	Applicability	Other comments	Incremental			Uncertainty
				Costs	Effects	Cost-effectiveness	
Jackson (2015) Preliminary cost-consequence analysis to compare the cost and outcomes of captain-led, sexual health advisor-led and poster	Minor limitations[a]	Partly applicable	**Study description** Preliminary cost-consequence analysis; NHS perspective.	**Probabilistic results** **Total cost of intervention (£):** **Captain-led:** 2491.61 **Health advisor-led:** 2738.09	**Probabilistic results** **Number of players tested:** **Captain-led:** 28 **Health advisor-led:** 31	**Probabilistic results** The results suggested that the total costs and average cost per player tested were similar across all interventions. No intervention	Screening uptake could not be estimated for any single intervention arm so conclusions about the relative cost-effectiveness of interventions could not be drawn. Uptake of STI testing may have been underestimated as the analysis did not capture additional downstream testing that may have occurred as a result of the intervention.

Study	Limitations	Applicability	Other comments	Incremental			Uncertainty
				Costs	Effects	Cost-effectiveness	
STI screening promotion among men in football clubs in England.				**Poster-only:** 2538.09 **Average cost of player screened (£):** **Captain-led:** 88.99 **Health advisor-led:** 88.33 **Poster-only:** 81.87	**Poster-only:** 31 **Percent of players accepting screening offer:** **Captain-led:** 50 **Health advisor-led:** 67 **Poster-only:** 61	was judged to be dominant.	**Review identified** As the analysis was a preliminary economic analysis, full incremental results were not calculated and only limited sensitivity analyses were conducted.

Abbreviations: NHS: National Health Service; NIHR: National Institute for Health Research; PSA: probabilistic sensitivity analysis; RCT: randomised controlled trial; STI: sexually transmitted infection; UK: United Kingdom

a. Minor limitations include: uptake of STI testing may have been underestimated, full incremental results were not calculated and only limited sensitivity analyses were conducted.

Study	Limitations	Applicability	Other comments	Incremental			Uncertainty
				Costs	Effects	Cost-effectiveness	
Kerry-Barnard (2020) Cost analysis alongside the Test n Treat feasibility trial	Minor limitations[a]	Partly applicable	**Study description** Cost analysis; one-year time horizon; NHS perspective	**Probabilistic results** **Cost per student (£):**	**Probabilistic results** **Number of students screened,**	**Probabilistic results** Results showed that higher uptake of the Test n	Although most test times were documented, some were estimates. The study may not be widely applicable as it was focused on six colleges in South London, where there is access to multiple NHS

Study	Limitations	Applicability	Other comments	Incremental			Uncertainty
				Costs	Effects	Cost-effectiveness	
of screening for chlamydia trachomatis (CT) and neisseria gonorrhoeae (NG)				1a. Average uptake non-incentivised: 237 1b. Lowest uptake non-incentivised: 1082 1c. Highest uptake non-incentivised: 88 1d. Half the average uptake non-incentivised: 448 1e. Double the average uptake non-incentivised: 13 2. Average incentivised uptake: 91 3. Maximum incentivised uptake: 47	**per day, per college:** 1a. 5 1b. 1 1c. 17 1d. 2.5 1e. 10 2. 19 3. 49	Treat service reduced the cost per screen. The study results suggest that incentivising testing could help increase uptake without reducing positivity rates.	sexual health services. Costs may be higher in other settings and uptake of services may be higher in other settings. Only a small number of students was screened per day which meant that the per student cost was sensitive to changes in the number of students screened per day. **Review identified** The study did not consider any outcomes and so did not calculate any incremental results. No sensitivity analyses were conducted.

Abbreviations: CT: chlamydia trachomatis; NG: neisseria gonorrhoeae; NHS: National Health Service; NIHR: National Institute for Health Research; PSA: probabilistic sensitivity analysis; UK: United Kingdom

a. Minor limitations include: the study was not widely applicable to other settings, only a small number of students were screened per day, the study did not calculate incremental results and no sensitivity analyses were conducted.

Study	Limitations	Applicability	Other comments	Incremental			Uncertainty
				Costs	Effects	Cost-effectiveness	
Looker (2019) Economic evaluation of six different recall methods for the retesting of chlamydia positive individuals.	Minor limitations[a]	Applicable	Economic evaluation; one-year time horizon; no discounting; NHS perspective.	**Intervention cost per person (£; 10-14 weeks since treatment of first infection):** 1. Client-led: 55.54 2. Reminder card: 55.64 3. SMS invitation: 58.28 4.Phone invitation: 67.31 5. Automatic postal test kit: 44.83 6. Advice at follow-up and SMS: 70.05	**Chlamydia Retest rate (%):** 1. Client-led; 5% 2. Reminder card; 4% 3. SMS invitation; 8% 4.Phone invitation; 6% 5. Automatic postal test kit; 10% 6. Advice at follow-up and SMS; 12%	**Adjusted cost per retest (£; incorporating incomplete uptake/non-return of kits):** 1. Client-led: 109 2. Reminder card: £130 3. SMS invitation: 120 4.Phone invitation: 289 5. Automatic postal test kit: 190 6. Advice at follow-up and SMS: 195	They did not specifically look at the effect of factors such as gender, country of birth, sexual orientation, perceived risk of infection and presence of symptoms on retest uptake and therefore cost They did not consider other important factors besides cost such as the demography of the population: for example, automatically sending out postal kits might be the only feasible option in rural areas.

Abbreviations: NCSP: National Chlamydia Screening Programme; SMS: Short Message Service; QALY: quality-adjusted life year

a. Minor limitations include: the study did not consider the effect of specific factors on retest uptake and cost.

Table 9: Summary of partially extracted studies included in the economic evidence review for STI testing uptake (RQ2.1)

deWit (2015): The Netherlands						
Population	**Interventions**	**Evaluation details**	**Effectiveness results**	**Cost results**	**ICER**	**Comments**
16–29-year-olds from three Dutch regions	Repeated register-based screening of Chlamydia. Six different scenarios were modelled 1. Invite all 16- 29-year-olds annually 2. Invite all women aged 16–29 years for annual screening 3. Invite 16– 24 years for annual screening 4. Only sending invitations every two years. 5. Sending invitations every two years to women only 6. Screening every five years	**Evaluation type:** Cost-effectiveness analysis **Perspective** Societal perspective **Time horizon** 10 years **Discounting** Costs discounted at 4% and effects were discounted at 1.5%	**QALYs:** 1. Annual screening: 135 2. Women only: 112 3. 16-24-year olds: 105 4. Biennial: 107 5. Biennial women: 73 6. Every five years: 77	**Total cost per infection treated (€):** 1. Annual screening: 6144 2. Women only: 4998 3. 16-24-year olds: 5535 4. Biennial: 5041 5. Biennial women: 5066 6. Every five years: 2739	Of all the scenarios screening every five years was the most cost-effective. **Cost per QALY gained (€):** 1. Annual screening: 232,143 2. Women only: Dominated by its next best alternative 3. 16-24-year olds: Dominated by its next best alternative 4. Biennial: 156,000 5. Biennial women: Dominated by its next best alternative 6. Every five years: 61,214	Register-based Chlamydia screening in the Netherlands was found to have relatively unfavourable cost-effectiveness ratios. Unfavourable cost-effectiveness was related to low uptake rates of the screening offer and further declining participation in consecutive rounds of screening. Sensitivity analyses showed that even the lowest utility values (for the decrements associated with infections) would not have changed the conclusion on the cost-effectiveness of screening.

Abbreviations: ICER: incremental cost-effectiveness ratio; MOA: major outcome averted; QALY: quality-adjusted life year

Gillespie (2012): Ireland						
Population	**Interventions**	**Evaluation details**	**Effectiveness results**	**Cost results**	**ICER**	**Comments**
Individuals aged 18-29 years old who accessed one of three healthcare settings- general practices, family planning or student health clinics	Opportunistic screening of Chlamydia trachomatis	**Evaluation type:** Prospective cost analysis **Perspective** Health provider perspective **Time horizon** 10 years **Discounting** 3.5%	Major outcomes (MO): pelvic inflammatory disease, ectopic pregnancy and tubal factor infertility in women, neonatal conjunctivitis and pneumonia, and epididymitis in men. **MO:** **Screening programme:** 618 **No screening:** 1317	**Cost (€):** **Screening programme:** 4,960,942 **No screening:** 720,074	The screening programme gave an ICER of €94,717 per QALY gained	The screening programme is unlikely to be considered cost effective by policy makers in Ireland. Programmes which target at-risk individuals may be more likely to be considered cost-effective. The analysis was taken from the health provider perspective meaning other resource implications such as costs incurred by wider society were not considered. UK resource utilisation, unit costs and utility data were used as national data was not readily available.
Abbreviations: ICER: incremental cost-effectiveness ratio; MO: major outcome; QALY: quality-adjusted life year; UK: United Kingdom						

Ritchie (2014): New Zealand						
Population	**Interventions**	**Evaluation details**	**Effectiveness results**	**Cost results**	**ICER**	**Comments**
Outpatients from the Auckland City Hospital adult HIV clinic	Opt-out screening of chlamydia, gonorrhoea and syphilis	**Evaluation type:** Economic evaluation **Perspective** Health care provider perspective **Time horizon** 9 months	STIs were not detected in women or heterosexual men. Treatable STIs were diagnosed in 10% of MSM	**Total cost per case diagnosed (NZ$):** **MSM Urine sample:** 5309 **MSM Rectal**	Not applicable	The study used simplistic costing that does not consider factors such as the cost savings from preventing STI transmission. This service was not fully integrated into their existing clinic visits. Therefore having test results available by the time the patient

Ritchie (2014): New Zealand						
Population	**Interventions**	**Evaluation details**	**Effectiveness results**	**Cost results**	**ICER**	**Comments**
		Discounting None	**MSM who screened positive for chlamydia:** 27 cases (2%) **MSM who screened positive for gonorrhoea:** 4 cases (<1%) **MSM who screened positive for syphilis:** 5 cases (1%)	**swab sample:** 664 **MSM Throat swab sample:** 3265 **MSM Serum sample:** 837		attends their next scheduled clinic visit will greatly reduce the resources required.
Abbreviations: HIV: human immunodeficiency viruses; ICER: incremental cost-effectiveness ratio; MSM: men who have sex with men; NZ: New Zealand; STI; sexually transmitted infection						

Ross (2016): Canada						
Population	**Interventions**	**Evaluation details**	**Effectiveness results**	**Cost results**	**ICER**	**Comments**
All users of four web platforms (Grindr, Facebook, Squirt and the Gay Ad Network)	Campaign to highlight syphilis outbreak and importance of seeking testing: advertisements on four web	**Evaluation type:** Cost and effectiveness evaluation **Perspective** Not reported **Time horizon**	No difference in syphilis testing was observed in the post-campaign period	**Mean cost per click (€):** **Facebook:** 68.18 **Gay Ad Network:** 60 **Squirt:**	Not applicable Both the Squirt and Grindr ads were cost-effective, compared to the Facebook and Gay Ad Network	Many assumptions were made in the analysis of the intervention, some of which may have been incorrect. For example, the target audience may have been too broad. It was unknown which proportion of men seeking testing were MSM; this subgroup may have been more likely to seek increased testing

Ross (2016): Canada						
Population	**Interventions**	**Evaluation details**	**Effectiveness results**	**Cost results**	**ICER**	**Comments**
	platforms (Grindr, Facebook, Squirt and the Gay Ad Network)	Not reported **Discounting** 3%		2.47 **Grindr:** 1.09	ads, but no relation was found between the campaign and testing rates	
Abbreviations: ICER: incremental cost-effectiveness ratio; MSM: men who have sex with men						

Smith (2016): Australia						
Population	**Interventions**	**Evaluation details**	**Effectiveness results**	**Cost results**	**ICER**	**Comments**
Participants from REACT trial (200 women, 200 heterosexual men, 200 MSM)	SMS reminders and home-based retesting and versus clinic-based testing of STIs	**Evaluation type:** Economic evaluation alongside an RCT **Perspective** Societal perspective **Time horizon** Lifetime **Discounting** 3% and 5%	Not applicable	**Overall cost per person (AUD $):** **Home retest pathway:** 154 **Clinic-based retest pathway:** 169 **Cost per repeat infection detected (AUD $):** **Home retest:** 1,409	Not applicable	The study did not estimate indirect costs, such as the cost to the patient. For example, the inclusion of transport costs in the clinic pathway would have increased the cost of this intervention Participants were not blinded to the study arm which may have impacted on their likelihood to retest

Smith (2016): Australia						
Population	**Interventions**	**Evaluation details**	**Effectiveness results**	**Cost results**	**ICER**	**Comments**
				Clinic-based retest: 3,133		
Abbreviations: AUD: Australian dollar; ICER: incremental cost-effectiveness ratio; MSM: men who have sex with men; RCT: randomised controlled trial; REACT: retest after Chlamydia trachomatis; STI: sexually transmitted infection						

Tuite (2014): Canada						
Population	**Interventions**	**Evaluation details**	**Effectiveness results**	**Cost results**	**ICER**	**Comments**
The model simulated 500,000 individual men similar to those enrolled in the Ontario HIV Treatment Network Cohort Study[a]	Frequent screening and screening with higher population coverage compared with usual care	**Evaluation type:** Economic evaluation using an individual-level state-transition simulation model **Perspective** Public health payer perspective **Time horizon** Lifetime **Discounting** 5%	**Mean QALY per person:** **Higher coverage** 6 months: 13.3497 3 months: 13.3548 Annual: 13.3468 **Usual care:** 13.3398	**Mean cost per person (CDN $):** **Higher coverage** 6 months: 1019.51 3 months: 1408.94 Annual: 1059.74 **Usual care:** 1310.25 **Incremental cost ($)** Higher coverage three-month screening vs. usual care: 98.69	**Incremental QALYs** Higher coverage three-month screening vs. usual care: 0.015 **ICER (Cost CND $/QALY):** Higher coverage three-month screening vs. usual care: 77,516.35 The ICER was cost-saving when with higher coverage strategies (screening frequency of 3 or 6 months)	Although the model made large assumptions and included parameters with uncertainty, the sensitivity analyses showed that the findings were still robust The analysis was restricted to HIV-positive MSM and did not consider MSM with no previous STIs Additional evidence on benefit of higher coverage of screening in a population with no previous STIs would be useful

Tuite (2014): Canada						
Population	**Interventions**	**Evaluation details**	**Effectiveness results**	**Cost results**	**ICER**	**Comments**
Abbreviations: CDN: Canadian dollar; HIV: human immunodeficiency viruses; ICER: incremental cost-effectiveness ratio; MSM: men who have sex with men; QALY: quality-adjusted life year; STI: sexually transmitted infection						
a. Burchell AN, Allen VG, Moravan V, Gardner S, Raboud J, et al. (2013) Patterns of syphilis testing in a large cohort of HIV patients in Ontario, Canada, 2000–2009. BMC Infect Dis 13: 246.						

1.1.9 Economic model

An economic model was developed to assess the cost-effectiveness of offering home self-sampling as a means of STI testing for asymptomatic people. This was chosen as the comparison to model, as the intervention with the best evidence of effectiveness from the quantitative systematic review. A full write up of the economic modelling is provided in appendix I.

1.1.10 Evidence statements

Quantitative

The following evidence was identified, but could not be included in the quantitative analysis due to limitations in the reported data:

- There is evidence from one further UK RCT on motivation interventions to increase the number of STI tests completed: Booth 2014 (n=253) reported a small but statistically non-significant effect of intervention type on test offer uptake, OR = 1.65 (95% CI 0.70, 3.88) p = .25, with 57.5% of motivational intervention participants accepting the offer of a test compared with 40.2% of standard promotion participants.
- There is evidence from one further Australian RCT on tailored interventions to increase the number of STI tests completed. Kang 2012 (n=312) reported no statistically significant difference in condom use between the tailored intervention group and the non-tailored intervention group at follow up (p=0.30).
- There is evidence from two UK RCT on financial incentives to increase the number of STI tests completed. Dolan 2014 (n=2988) reported no statistically significant differences between any incentive types and no statistically significant difference between incentive compared to no incentive. Those receiving a £5 voucher on sample return had the highest rates of return (73.2%) while those receiving an endowment of a £10 voucher had the lowest (67.9%). The non-incentive group had a return rate of 69.4%. Niza 2014 (n=1060) reported a statistically significant difference between incentive and no-incentive: 8.9% return rate for the incentive group, 1.5% return rate for the non-incentive group, z 3.42 (1.16 to 4.28), p<.001. Niza 2014 also reported a statistically significant difference between reward types: 22.8% return rate for vouchers, 2.8% return rate for lottery, z 3.61 (0.54 to 1.82), p<.001

Economic

- Bracebridge (2012) assessed the cost effectiveness of chlamydia screening using the global dispatch of kits, web-based data collection and test reporting and treatment dispatch by post among 18-24-year olds in the UK. Findings from the analysis showed that the NEEPCT intervention was more costly than the NCSP comparator, with the cost per screening test 1.66 times higher and the cost per positive diagnosis 3.5 times higher. The authors highlighted that the analysis was limited to data on IMD for the predictors of test uptake, as IMD is dependent on postcode any incorrect assignment of a postcode may result in bias analysis. The reviewers highlight that sensitivity analysis was not conducted and that the simplistic costing used does not consider factors such as the cost savings from preventing STI transmission.
- Jackson (2015) assessed the cost effectiveness of three STI screening promotion interventions for men in football clubs in England. Findings from the analysis suggested that the total costs and average cost per player tested were similar across all interventions and no intervention was judged to be dominant. Sensitivity analysis showed that adjusting the costs associated with each intervention arm subsequently led to a change in the overall cost per player screened for each intervention. The authors highlighted that the uptake of STI testing may have been underestimated as the analysis did not capture

additional downstream testing that may have occurred as a result of the intervention. The authors suggested analysing further uncertainties around cost and outcome parameters if a full RCT was conducted. The reviewers highlight that, as the current study was a preliminary economic evaluation, full incremental results were not calculated.

- Kerry-Barnard (2020) conducted a cost analysis of various uptake scenarios of the Test n Treat screening intervention for chlamydia trachomatis (CT) and neisseria gonorrhoeae (NG). Results showed that higher uptake of the Test n Treat service reduced the cost per screen. The study results suggest that incentivising testing could help increase uptake without reduce positivity rates. The authors highlighted that the study may not be widely applicable and that costs may be higher in other settings and uptake of services may be higher in other settings. The authors also stated that only a small number of students was screened per day which meant that the per student cost was sensitive to changes in the number of students screened per day. The reviewers highlight that full incremental results were not calculated.
- Looker (2019) assessed the cost effectiveness of six of the most commonly used recall methods for chlamydia retesting for 15–24-year-old GUM clinic attendees. Findings from the analysis showed that the client led no active recall was the most cost-effective, with the cost per retest at £109. Sensitivity analysis showed that adjusting to a longer recall timeframe had a substantial impact on lowering the cost per retest. The authors highlighted that they did not assess the effects of the participant's demographics such as sexual orientation on retest uptake and therefore cost. The authors suggested that future research may benefit from assessing online testing with automated recall as this is the most likely to be economical.

2 Acceptability of strategies to improve uptake of STI testing

2.1 Review question

What factors influence the acceptability of the strategies used to improve the uptake of STI testing?

2.1.1 Introduction

Data from Public Health England show the overall number of STI diagnoses increased by 5% between 2018 and 2019. STIs can affect personal wellbeing, mental health and relationships and can also lead to serious health problems including pelvic inflammatory disease, ectopic pregnancy or infertility. It is therefore important to address interventions to help prevent or reduce STIs.

STI testing, diagnosis and treatment are central to STI prevention strategies. The purpose of this review is to establish the acceptability of strategies for improving the uptake of STI testing.

2.1.2 Summary of the protocol

Table 2.1: PICOS

Eligibility criteria	Content
Population	Sexually active people from age 16. This will include younger people who contact or use sexual health services and are considered to be Gillick competent and satisfies the Fraser guidelines.
Factors	Factors that influence the acceptability of the strategies for improving testing uptake in individuals who are the target of these strategies. (This will include interventions or strategies identified in RQ2.1, but is not restricted to these)
Comparator	Not applicable
Outcomes	Outcomes will include individual perspectives, experiences, values, beliefs, preferences, views and considerations that influence the acceptability of the strategies.
Study type	Qualitative studies

For the full review protocol see appendix A.

2.1.3 Methods and process

This evidence review was developed using the methods and process described in Developing NICE guidelines: the manual. Methods specific to this review question are described in the review protocol in appendix A and the methods document.

Declarations of interest were recorded according to NICE's conflicts of interest policy.

2.1.4 Qualitative evidence

2.1.4.1 Included studies

5,673 references were initially identified from the literature search. 40 qualitative papers were ordered in full-text. Of these, 15 qualitative studies met the inclusion criteria for the qualitative review as outlined in the review protocol.

2.1.4.2 Excluded studies

The full list of excluded studies and reasons for exclusion are in appendix J.

2.1.5 Summary of studies included in the qualitative evidence

See table 2.1 for a summary of the study characteristics and appendix D for full evidence tables.

Table 2.2: Summary of studies included in the qualitative review

Study	Design and analysis	Setting	Sample size	Population	Objective
Aicken, 2016	In depth interviews	Further Education college	25	16-24 year old college students	To explore perceptions and acceptability of remote STI self-testing and associated online care pathways to treatment (a hypothetical intervention), among young people from an Inner-London locality with high rates of STIs and large populations of Black Caribbean and African ethnic origin
Estcourt, 2016	Semi structured interviews with popular opinion leader theory	Amateur football clubs	32 in total	18-35 year old men who play in an amateur football club.	• To develop, through qualitative research and consumer and stakeholder consultation, two feasible and replicable interventions for delivering STI screening in football club venues. • To determine the acceptability to young men and the feasibility of football trainer-led STI and HIV screening.[1]
Fleming, 2020	Semi structured interviews with Goffman's theory of stigma and the construct of 'candidacy'	Technical FE colleges where "Test n Treat" intervention was offered	26 in total: 13 who attended testing and 13 who did not.	16-24 year old college students	To evaluate the trial implementation, to offer explanatory theories as to the success or failure, and to inform future research and/or service provision decisions: • Is the provision of rapid chlamydia and gonorrhoea testing in technical colleges viewed as acceptable and appropriate by students? • What are the barriers and facilitators to uptake as perceived by young people, teaching staff and on-site researchers? • What factors or strategies might improve uptake of rapid chlamydia and gonorrhoea testing in technical colleges from the perspectives of young people, teaching staff and on-site researchers?
Fuller, 2019	Semi structured interviews	Sexual health clinics	61	Heterosexual and MSM STI clinic service users	There is less knowledge of patient perspectives on how implementation of these technologies may change patient care, and no published research on patient perspectives for implementing AMR POCTs in SHCs. [Inferred aim to provide this] [1]
Gkatzidou, 2015	Focus Groups	Higher education and further education institutions.	49	16-24 year old students	To identify users' functional and non-functional user interface design requirements and propose design recommendations applicable to mobile sexual health application user interface design.

Study	Design and analysis	Setting	Sample size	Population	Objective
Hogan, 2010	Semi structured interviews with Theory of Planned Behaviour	GP surgeries	36	16-24 year olds attending general practice	• Determine young people's opinion of being offered a chlamydia screen at their GP surgery and to determine whether these differ in GP surgeries with high and low screening rates. • Identify what provisions are needed within GP surgeries to optimise the quality and effectiveness of delivery of the NCSP
Jackson 2021	Interviews and focus groups	Community centres and sexual health clinics	41	Young people age 16 – 24	• Identify the characteristics of STI screening provision that are important to young people; • Establish young people's preferences for different characteristics of STI screening and how these vary by subgroup; • Understand how young people make trade-offs between different service characteristics.
Jones, 2017	Semi structured interviews with Theory of Planned Behaviour	GP surgeries	30	16-24 year olds attending general practice	To expand on the previous research and use qualitative methods to explore patients' attitudes to this wider 3Cs and HIV offer, using the theory of planned behaviour to provide an understanding of any potential facilitators or barriers to implementing this intervention.[1]
Loaring, 2013	Focus Groups	Brook centre (sexual health for under-25s)	12	Young people attending the clinic	To report the experiences, meanings and reality of participant's feelings towards chlamydia screening
Lorimer, 2013	Focus Groups	University and community spaces	60	16-24 year old men	To explore the barriers and facilitators to implementing an Internet-based chlamydia screening approach, including the acceptability of such an approach.
Middleton 2021	Interviews and focus groups	Community spaces	25	16-65 MSM and heterosexual men and women with mild learning disability	To explore barriers and facilitators to correct use of an STI/BBV self-sampling pack among people with mild learning disabilities.
Normansell, 2016	Semi structured interviews (single or in pairs) with	Further education college	17	16-27 year old female students	To explore access and attitudes to STI screening in high risk, 20 young, ethnically diverse female students recruited outside of the healthcare system.

Study	Design and analysis	Setting	Sample size	Population	Objective
	'Candidacy', the theory of planned behaviour, and stigma theories				
Powell, 2016	Semi structured interviews with Protection Motivation Theory and Theory of Planned Behaviour	University	18	University students who had used a self-test kit	To explore self-testing for chlamydia from the perspective of young adults, to identify factors that may predict self-testing outside the context of formal screening programmes and to understand how self-test use impacts on individuals. A key secondary aim was to identify theoretical domains that explain the qualitative findings and which could form an effective framework for further research.
Richardson, 2010	Unstructured interviews	FE colleges and University	14	16-24 year olds students who declined a chlamydia test	To develop themes and hypotheses from interviewing young people declining chlamydia testing as to why they declined the test.
Wayal, 2011	Semi structured interviews	Sexual health clinic	24	Men who have sex with men, who have used a self-test kit.	To evaluate the feasibility and acceptability of home sampling kits for STI/HIV and to evaluate the sensitivity and specificity of self-collected rectal and oropharyngeal specimens to detect Chlamydia trachomatis and Neisseria gonorrhoea among men who have sex with men. In this paper we explored participants' views to inform the development of services offering home sampling kits for STI/HIV[1]

[1]Data regarding HIV testing, condom distribution, and sexual health services other than testing were not extracted

See appendix D for full evidence tables

2.1.6 Summary of themes and sub-themes

Iterative aggregation of codes generated the following key themes and sub-themes

Table 2.3: Summary of themes and sub-themes

Major theme	Sub-themes
Reasons for testing	Most participants accepted testing for peace of mind.
	Few participants tested because of their sexual health risk status.
	Many participants reported testing in order to receive an incentive.
Accessibility of self-sampling to people with mild learning disabilities	Participants with mild learning disabilities lacked confidence with testing and wanted support.
	Participants with mild learning disabilities had difficulty understanding the test instructions
	Participants with mild learning disabilities found it difficult to use the test kit.
Intervention quality and practicalities	Participants were concerned about data security.
	Several participants questioned the accuracy of tests used outside of clinic settings.
	Participants had some concerns about the practicalities and reliability of using phone apps and the postal service.
Design and credibility of the intervention	Visibility, familiarity and advertising increased trust in the service.
	Aesthetics, language, and design appeal influenced how participants felt about the intervention.
	Participants wanted to access testing using technology that fulfilled their needs and matched their preferences.
The experience of using the test	Convenience was frequently mentioned as one of the main benefits of these interventions.
	Speed was an important aspect for many participants.
	Many participants described self-test kits as easy to use.
	Some participants felt anxiety about sexual health screening, both with and without the interventions.
	Some participants expressed a desire for more control and choice in their screening experiences.
Confidentiality and stigma	Participants highly valued a confidential and anonymous service.
	The ability to conceal testing from others was important.

Major theme	Sub-themes
	Many participants were concerned about embarrassment.
	Participants were concerned that people may make inferences about their sexual behaviour.
	Gender performativity[1] can increase or decrease stigma.
Involvement of healthcare professionals	Face to face interaction can positively or negatively influence how comfortable participants feel about testing.
	Participants valued personal support from a healthcare provider.
	Some participants felt they needed a healthcare profession's involvement for practical assistance and clarification.
Where the tests are available	Some participants preferred to receive sexual health services within a medical setting.
	Participants appreciated being offered testing in social community spaces.
	Self tests were reviewed positively by most who used them.
	Some participants preferred sexual health clinics and felt that testing in other settings was not appropriate.

[1]Gender performativity is the act of behaving in ways that adhere to and reinforce the social constructs of masculinity and femininity

2.1.7 Summary of the qualitative evidence

Table 2.4: Summary of the qualitative evidence

Finding	Studies	Illustrative quotes	CERQual explanation	Confidence
Reasons for testing				
Most participants accepted testing for peace of mind. They did so opportunistically, when they would not have sought out a sexual health clinic	Estcourt 2016b Powell 2016 Wayal 2011	"I didn't have any reason to be concerned about having Chlamydia, I just wanted it to be for peace of mind"	Downgraded twice for minor concerns about adequacy	Moderate

Finding	Studies	Illustrative quotes	CERQual explanation	Confidence
		"as they offered I didn't see the point in turning it down"		
Few participants tested because of their sexual health risk status. Many had little knowledge of STIs and no awareness of their own risk and so were not driven to test by their perception of their risk status. Despite this, there were mixed opinions on providing education alongside the interventions. Some took the opportunity to ask questions, but others found it off-putting.	Estcourt 2016a Estcourt 2016b Fleming 2020 Fuller2019 Hogan 2010 Jackson 2021 Jones 2017 Loaring 2013 Normansell 2015 Wayal 2011	"'I mean, even I don't really know what chlamydia is and I'm 24, so a lot of young people don't know.'" "Do you think I'm going to sit here, like really? Am I going to read this? I don't even read my course work."	Downgraded twice for moderate concerns about coherence	Low
Many participants reported testing in order to receive an incentive. However, this acted as a facilitator to getting tested, but rather than it being because they wanted the reward, it was because participants felt they could avoid stigma by claiming they were taking part to gain the incentive rather than admitting to wanting to be tested.	Powell 2016 Loaring 2013 Fleming 2020	"If you were to give out condoms more boys would come"	Downgraded once for minor concerns about relevance and adequacy	Moderate
Accessibility of self-sampling to people with mild learning disabilities (MLDs)				
Participants with mild learning disabilities lacked confidence with testing and wanted support. Most participants with MLDs had little existing knowledge or understanding of STI testing. Participants felt anxious and overwhelmed by trying to follow the test kit's instructions and did not feel confident approaching the task. Many said that they would want support to use the kit, and most of	Middleton 2021	"I'd rather go to the doctor's, 'cause then you'd know what's getting done, right then"	Downgraded twice, for moderate concerns about adequacy and minor concerns about coherence	Low

Finding	Studies	Illustrative quotes	CERQual explanation	Confidence
these participants preferred to get help from a GP or support worker.				
Participants with mild learning disabilities had difficulty understanding the test instructions. They found the written instructions too long and difficult to read. The diagrams were helpful for some, but others struggled to interpret the anatomic sites they showed. They suggested ways that this could be improved, in particular they felt that YouTube videos demonstrating the kits would be easier to follow.	Middleton 2021	"See, you wouldn't know if that's the back to the front… [on anatomical diagram]"	Downgraded twice, for moderate concerns about adequacy	Low
Participants with mild learning disabilities found it difficult to use the test kit. Some participants had problems with motor skills and manual dexterity, which made it difficult to take blood samples. Some women did not have enough knowledge of their genitalia to complete the test. Participants were also concerned that the tests would not be effective if they did not complete them correctly.	Middleton 2021	"you could have taken it incorrectly, and it would have given an improper reading"	Downgraded twice, for moderate concerns about adequacy	Low
Intervention quality and practicalities				
Participants were concerned about data security. This made them cautious about disclosing personal information without	Aicken 2016 Fleming 2020 Gkatzidou1 2015	"I am quite careful about where I put my data online, as soon as one of these companies gets a piece of information, it just goes to everybody"	Downgraded once for minor concerns about relevance	Moderate

Finding	Studies	Illustrative quotes	CERQual explanation	Confidence
knowing why it is needed and how it will be used.		"Why are you asking for postcode? …Full postcode narrows it down to a street, so if you are in the middle of nowhere and there are no families living around there, within the range they could trace it back to you."		
Several participants questioned the accuracy of tests used outside of clinic settings. More specifically, some were concerned that the tests were able to be distributed widely because they were cheaper and therefore possibly poorer quality. Some participants also expressed distrust of 'faceless' healthcare and were concerned about the expertise of the people involved in the testing program.	Wayal 2011 Powell 2016 Jones 2017 Gkatzidou1 2015 Estcourt 2016a Aicken 2016	"How do I know that this medication that they are prescribing me is the right one… and WHO is this person prescribing me?" "[a cheap test] might not be as accurate"	No downgrading required	High
Participants had some concerns about the practicalities of the proposed interventions. They felt that rapid testing would not be as fast in reality if there is high demand to use the service. Those using home tests were concerned that the software might be unreliable or that their samples could be damaged or lost in the post.	Wayal 2011 Powell 2016 Fuller2019 Aicken 2016	"if the clinic has one [machine], and you see people every five minutes, you're going to end up with a massive queue just to wait half-an hour for each test" "No, I've got the most useless postman in the world. I get other people's mail and it horrifies me to think what mail other people might get of mine."	Downgraded once for minor concerns about relevance	Moderate
Design and credibility of the intervention				

Finding	Studies	Illustrative quotes	CERQual explanation	Confidence
Visibility, familiarity and advertising increased trust in the service. Participants felt were more willing to use a well-known and established testing program. Association with the NHS was frequently mentioned as an indicator of credibility.	Wayal 2011 Loaring 2013 Jones 2017 Hogan 2010 Gkatzidou1 2015 Estcourt 2016b Estcourt 2016a Aicken 2016	"That it's part of the NHS? It makes me feel safe, it makes me feel okay," "'I mean this is totally new, so you would think twice before trusting it. If I saw it advertised somewhere, or available in Boots then I would think it is …you know…legit'"	Downgraded once for minor concerns about relevance	Moderate
Aesthetics, language, and design appeal influenced how participants felt about the intervention. Young people wanted language that appealed to them but were critical of attempts to appear 'cool' which they found patronising. They considered a professional looking design to be more appropriate and give the impression of taking their health seriously as an adult issue.	Lorimer 2013 Gkatzidou1 2015 Estcourt 2016b	"Why do they keep putting, like, "R U" and stuff? I actually don't know anyone who texts like that anymore." "See, the first one [website], I would not type my details." "It's a graffiti font there. I can't take that seriously… It's not about being bad websites, but serving a purpose. In this case, it's about health, it's not about being cool, which that website aims"	No downgrading required	High
Participants wanted to access testing using technology that fulfilled their needs and matched their preferences. Some wanted specific features such as reminders and others were particular about which platforms were best suited to delivering the intervention. Many were not willing to download a phone app for a single purpose. People with mild learning disabilities described feeling overwhelmed to varying degrees when opening the pack and did not know where to start.	Fleming 2020 Gkatzidou1 2015 Lorimer 2013 Middleton 2021 Normansell 2015	"I prefer web apps…I don't like to download apps as it clogs up my phone, so having a web app means you can go to it without having downloaded it… I am not sure how many times I would use this app, so it would just get deleted…" "So if there was a sort of set-up with advertising and with reminders and things, that would be really helpful because I have a memory like a leaky sieve."	No downgrading required	High
The experience of using the test				

Finding	Studies	Illustrative quotes	CERQual explanation	Confidence
Convenience was frequently mentioned as one of the main benefits of these interventions. Using self-test kits and making tests available in different settings enabled participants to access testing with minimal effort; they commented that they may not have scheduled a clinic visit but were happy to take a quick test in their own time.	Wayal 2011 Powell 2016 Normansell 2015 Lorimer 2013 Jones 2017 Jackson 2021 Hogan 2010 Fuller2019 Estcourt 2016b Estcourt 2016a Aicken 2016	"…you could be in the bath, be like using the toilet, and be like, let me just get this real quick and do this real quick. It's… convenient, very convenient. That's why I like it" ""I think cos its quite convenient as well cos I think if you're working and everything it is a bit of a hassle trying to, it's a hassle for me just to try and get to see my doctor; you have to kind of phone in advance and you have to phone in at a certain time and it's a bit annoying. And then you have to have you've got the waiting as well. So I think it's just, it's more convenient and you can do it whenever really""	No downgrading required	High
Speed was an important aspect for many participants. Most preferred a faster test with faster results. Some, however, were concerned that there would be a balance between speed and accuracy, in which case they would prefer a more accurate test to a fast one. For participants who were asked about rapid point-of-care tests, the speed felt paradoxical: They were pleased to have their results faster, within an hour rather than a few days, however this meant a longer clinic visit was needed to allow time for that 30 minute wait. Some did find this acceptable as long as they were informed in advance and given a choice.	Aicken 2016 Estcourt 2016b Fuller2019 Jackson 2021 Loaring 2013 Normansell 2015 Wayal 2011	""I think for any test you feel apprehensive and you feel uncomfortable. So any shortening of that time from test to solution is a positive thing in my eyes." "everything is fast now" "Probably [I would prefer] less time [in clinic] and a text message in a few days"	Downgraded once for minor concerns about relevance and minor concerns about coherence	Moderate
Many participants described self-test kits as easy to use. They felt confident that they had administered the test correctly and that	Aicken 2016 Estcourt 2016a Estcourt 2016b Jones 2017	". . it just seemed really easy" "if it had a jiffy bag in to send them off and then post them I think would be the easiest… If	No downgrading required	High

Finding	Studies	Illustrative quotes	CERQual explanation	Confidence
the procedure for returning samples was simple and straightforward.	Loaring 2013 Powell 2016 Wayal 2011	they're in the envelope you can just shove them in the letterbox and it's done."		
Some participants felt anxiety about sexual health screening, both with and without the interventions. Some anxiety was about the experience of testing, but most focused on worries about receiving the results and how they would react to a positive test. This worry was sufficient for some participants to avoid seeking testing. Several participants stated that they would avoid testing until symptoms worsened.	Estcourt 2016a Estcourt 2016b Hogan 2010 Jackson 2021 Loaring 2013 Normansell 2015 Powell 2016	"They try to make you feel at ease but for me it just didn't work. I wanted to cancel at the last min and then when I got there I felt like turning round and walking out." "Some people don't like to know their results.. .they'd rather die.. .so it's something like that, just scared of knowing what you've got" "…probably just say 'oh it's just a bit of pain, nothing to worry about'"	No downgrading required	High
Some participants expressed a desire for more control and choice in their screening experiences. There was anxiety about the invasive nature of some clinic tests and both the social and physical discomfort of being examined. These participants found self-test kits more acceptable as they allowed them to avoid this experience. Some participants also wanted a choice in the type of self test, as they would feel more comfortable giving a urine sample instead of a swab. Some participants did not feel like they were able to refuse or ask for different test options.	Estcourt 2016a Fuller2019 Jackson 2021 Jones 2017 Powell 2016 Richardson 2010	"..if they have to get their kit off in front of someone else it's quite embarrassing.. . let's face it putting your legs up in those stirrups is not the most dignified position in the world!" ""you can choose as well the method . . . but you feel like less pressured and more relaxed and you can take your time… it's like, it's all your own decision"" "because it really wasn't what I expected, um, I just expected to do a urine test and it wasn't and it gave you sort of an instruction list of how to do the swab em, but yeah it was a bit scary"	No downgrading required	High
Confidentiality and stigma				

Finding	Studies	Illustrative quotes	CERQual explanation	Confidence
Participants highly valued a confidential and anonymous service. This was often described as a crucial element of any intervention or test service. Home test kits were particularly praised for allowing participants to test with no face-to-face interaction.	Aicken 2016 Estcourt 2016a Estcourt 2016b Fleming 2020 Jackson 2021 Jones 2017 Lorimer 2013 Powell 2016 Wayal 2011	"I saw that there was just a drop box, sort of no one, yeah, I thought it was good because it was confidential." "The anonymous part of this is just brilliant compared to having to sit [at a clinic]" "would rather that 'cause there's not no one in front of me like talking to me or looking at me…"	No downgrading required	High
The ability to conceal testing from others was important. Participants did not want to be seen taking or returning test kits or to have their results returned in a format that others could access. Several participants stated that their phones and post were not private.	Aicken 2016 Estcourt 2016a Fleming 2020 Gkatzidou1 2015 Hogan 2010 Jackson 2021 Jones 2017 Loaring 2013 Powell 2016 Richardson 2010	"I live in halls and you know how it is, people just constantly grab your phone off you to check what games and apps you got… I have a passcode on my phone, but that is like 4 digits, my mates already know it anyway'." "you've got to walk past the really busy reception with your … with your wee sample or something, but I mean that's a problem in a lot of places"	No downgrading required	High
Many participants were concerned about embarrassment. The stigma of STIs most commonly manifested as humiliating or shameful to be associated with, so even asymptomatic testing required courage to be seen doing. Young people were particularly worried about their parents finding out they took a test, as many had not told their parents about their sexual activity.	Aicken 2016 Estcourt 2016a Estcourt 2016b Fleming 2020 Gkatzidou1 2015 Hogan 2010 Jackson 2021 Jones 2017 Loaring 2013 Lorimer 2013 Normansell 2015 Powell 2016	"'I grew up in a Christian family…and this is a 'hot topic'…. I wouldn't want my sister, or my mum or my dad finding an app on my phone that says sexual." "I'd find it quite embarrassing going to a clinic and just like you know, everyone knowing you had unprotected sex or whatever. But erm, yes so I think the idea of doing it at home is like, is quite a good thing" "It depends on the age range and the maturity range I think because now at 20 I don't give a	No downgrading required	High

Finding	Studies	Illustrative quotes	CERQual explanation	Confidence
	Richardson 2010	damn and I think my parents would be quite happy that I'm getting screened. But 18 year old me did not want my parents knowing about any of it.. . sex and parents just don't go together, they don't"		
Participants were concerned that people may make inferences about their sexual behaviour. They feared being judged as 'unclean' or 'slutty'. Some participants applied these views to others who use sexual health services. Participants also said that they would react negatively if their partner accepted a test and believed their partner would do likewise.	Aicken 2016 Estcourt 2016a Fleming 2020 Hogan 2010 Jones 2017 Lorimer 2013 Normansell 2015 Powell 2016 Richardson 2010 Wayal 2011	"..well going to the clinic.. .all the people there.. ..it's full of skanky 15 year olds" "..it seems like you sleep around or...that you're not careful...I think there's a lot of stigma attached to it; it's thought of as dirty I suppose and just a bit slutty if you have one [STI] " "It might change the way I thought about them slightly . . . there's nothing very sexy about a sexually transmitted disease"	Downgraded once for minor concerns about coherence	Moderate
Gender performativity can increase or decrease stigma. Some young men used humour to enforce norms of rejecting testing. Adult men counteracted stigma by encouraging a 'lads together' approach to normalise testing while emphasising masculinity. MSM felt a particular need for privacy due to homophobia.	Estcourt 2016a Estcourt 2016b Fleming 2020 Loaring 2013 Wayal 2011	"cos it's in a lads' environment, it's all like, oh he's got a testing kit, he must be getting some action. That kind of thing. So I think 'cos it's in that environment I don't really think people would be embarrassed about it. They'll probably go, yeah, you know, I had this girl last week and a girl the week before and you just get a bit, a lot of egos flying about and it will create a lot of banter I think." "large groups of boys, you know 'showboating' around, making negative comments and jokes about sexual diseases"	No downgrading required	High
Involvement of healthcare professionals				
Face to face interaction influences how comfortable participants feel about testing. Some participants felt judged and	Estcourt 2016a Hogan 2010 Jones 2017 Middleton 2021	"It was horrible, they were so judgemental...like they would say if you're pregnant and you lie	Downgraded twice, for moderate concerns about	Low

Finding	Studies	Illustrative quotes	CERQual explanation	Confidence
uncomfortable seeking testing from clinic staff so preferred to avoid interaction. Others were encouraged to test by interacting with providers who had a rapport and familiarity with them.	Normansell 2015	about your address and that like they'll get social services involved and they'll tell your mum." "Because if you've got a doctor that's coming in it's immediately, 'Oh he's a doctor. How am I going to relate to a doctor?' If he's a 50-year-old doctor you're not. If he's someone closer to their age then you are much more likely to"	coherence and minor concerns about relevance	
Participants valued personal support from a healthcare provider. This was particularly important when receiving test results. They felt they would not know what to do about a positive result on their own and would want to have it explained to them so they could ask questions and seek reassurance.	Aicken 2016 Estcourt 2016b Hogan 2010 Jones 2017 Powell 2016 Wayal 2011	"I'd be a little scared because that's the thing, I need my doctor to just tell me, calm me down and tell me like, you know, it's not the end of the world we can fix it. But if I'm at home by myself, you know. I think I would just go a little crazy because I wouldn't know what to do with it" "if it's something on your phone you don't really wanna read so much. But if you can talk to someone, not a computer, someone real, then you're most likely to listen"	No downgrading required	High
Some participants felt they needed a healthcare professional's involvement for practical assistance and clarification. Participants who used a self-test kit that involved a questionnaire sometimes did not understand the questions or could not give a straightforward answer to them. Some participants also did not feel confident administering the test themselves. Participants with mild learning disabilities voiced a need for someone else to help navigate the pack. For some, the complexity of the pack and the knowledge and understanding required to undertake self-sampling meant that they would rather go to	Estcourt 2016b Gkatzidou1 2015 Hogan 2010 Jones 2017 Middleton 2021 Powell 2016 Wayal 2011	"I am worried that people might have something completely unrelated, like 'rash'; some people have eczema, so they might be worried. So it is assuming that it means a rash….well…'down there'…but maybe it actually should specify" "I would have probably asked them to do it in all honesty; I probably would have asked them, yeah… I didn't necessarily have the confidence in myself" "I'd rather go to the doctor's, 'cause then you'd know what's getting done, right then."	Downgraded once for minor concerns about coherence	Moderate

Finding	Studies	Illustrative quotes	CERQual explanation	Confidence
their general practitioner (GP) or sexual health service than try themselves.				
Where the tests are available				
Some participants preferred to receive sexual health services within a medical setting. They felt GP surgeries were the appropriate place to be offered a health intervention and they had an established trusting relationship with the staff. Medical expertise was seen as the key advantage accessing tests here rather than community settings.	Aicken 2016 Hogan 2010 Jones 2017 Loaring 2013 Middleton 2021 Wayal 2011	"If I was concerned about chlamydia, I'd rather do it at my GP's surgery because my GP knows me and I'd feel more sort of comfortable discussing options with them, and knowing that they know my history and stuff like that" "I'm much more easily prepared to talk about things [to] ... people who you think are qualified medically I suppose, do you know what I mean? Rather than a shop assistant"	Downgraded once for minor concerns about relevance and coherence	Moderate
Participants appreciated being offered testing in social community spaces. It was seen as more convenient to take the opportunity as it was offered than to seek out testing. The presence of friends often acted as a facilitator to testing in social spaces, as testing together as a group removed the embarrassment of making an individual decision to test. Young women in particular often encouraged each other to take a test.	Estcourt 2016a Estcourt 2016b Fleming 2020 Gkatzidou1 2015 Hogan 2010 Loaring 2013 Powell 2016 Wayal 2011	"I'd probably, being a boy, I'd prefer it how I have just done it with the football team… I suppose if you're doing it like how your team done it, then I suppose it makes people feel a bit more relaxed and stuff. It certainly made me a bit more relaxed than going to the doctor's or something." "One of my mates said you might as well do it. I was like, OK, I might as well see as well. So that's why I did it" ""I was doing my Florence Nightingale bit and saying how I'd done some research.""	Downgraded once for minor concerns about coherence	Moderate
Self-tests were well reviewed by most who used them. There was a lot of general enthusiasm about the option to complete a test at home. Participants felt that the privacy and control over the situation removed a lot of	Aicken 2016 Fleming 2020 Jones 2017 Loaring 2013 Lorimer 2013 Normansell	"If I had to do it, if I was going to be, see myself round and I needed to get tested, I would choose this option [Internet screening] over going to the GP or the clinic."	Downgraded once for minor concerns about relevance	Moderate

Finding	Studies	Illustrative quotes	CERQual explanation	Confidence
the barriers they associated with other test locations.	2015 Wayal 2011	"Just get it done quicker, just get it out there fast. Cos it sounds good, so it should be out there"		
Some participants preferred sexual health clinics and felt that testing in other settings was not appropriate. In some social spaces, sexual health interventions can feel 'preachy' or serve as an unwelcome reminder of poor health. In GP surgeries, some participants felt patronised by being profiled for a test when they wanted to use their appointment time to discuss a different medical issue. Some felt that where to test depended on the context for wanting a test. They were happy to use the intervention services for asymptomatic routine testing but would want the full clinic experience if they had symptoms or believed themselves to be at risk.	Estcourt 2016b Fleming 2020 Fuller2019 Jones 2017 Lorimer 2013 Normansell 2015 Powell 2016 Wayal 2011	"Doing a urine sample there and then is, ummm, is just extra GP time and maybe that would take away from time you need to actually talk about the problem that you came in for" "on the gay scene, .. . because people were always sticking buckets in my face or doing things, handing out safe sex packs and things and sometimes my friend when he ... the guy who died, when he went into a club he didn't want to remember [being HIV positive], he just wanted to go out there and socialise and have a good time ..." "I think if I had symptoms I would go straight to a clinic because it's obviously something that needs ... you know medical [intervention]"	No downgrading required	High

See appendix F for full GRADE-CERQual tables

3 Integration and discussion of the evidence

3.1 Mixed methods integration

The section headings in this integration are based on the mixed methods questions recommended by the Joanna Briggs Institute manual chapter for mixed methods reviewing.

Are the results/findings from individual syntheses supportive or contradictory?

The effectiveness evidence showed that home testing is effective for increasing the uptake of STI testing and that tailoring of interventions is effective in terms of increasing the number of tests taken and the intention to get tested. It did not find a meaningful difference for a computer assisted interviewing intervention in sexual health clinics.

This evidence is consistent with the finding from the qualitative synthesis. Themes from the synthesis support a preference for remote self-sampling and tailoring of interventions, though the qualitative evidence also highlights the importance of being able to access in-person testing at a sexual health clinic or other venue.

Does the qualitative evidence explain why the intervention is/is not effective?

Themes from the qualitative evidence support the findings of the effectiveness review. The qualitative evidence highlights positive aspects of screening at home such as its convenience and speed. They also highlighted concerns around confidentiality and anonymity in face-to-face services and were concerned that they would be embarrassed or feel judged, especially during face-to-face interviews with a healthcare professional. These themes support the finding that uptake of testing is higher in remote self-sampling interventions because they explain why people might prefer remote tests. They also explain why the in-clinic computer supported interview intervention was not found to be effective – it does not address peoples concerns about embarrassment or feeling judged.

The qualitative evidence provides less support for the effectiveness evidence about tailoring approaches, however the theme about the design and credibility of the intervention highlights that people trust services more if they feel familiar to them and respond to the aesthetics, language and design of interventions. This may explain the relative effectiveness of tailored interventions.

Qualitative finding showed that incentives were useful ways of encouraging people to test, but not necessarily because of the incentive, but because it gave them a reason to test that they could use to justify testing to their peers. The quantitative evidence was sparse and contradictory about the effectiveness of incentive interventions.

Does the qualitative evidence explain differences in the direction and size of effect across the included quantitative studies?

The remote self-sampling interventions vs in-clinic testing showed large amounts of heterogeneity (I^2 over 70% in each case). This heterogeneity may be partly explained by qualitative findings about preferences for in-clinic vs remote testing. Qualitative findings report that even though there are many benefits to remote self-sampling, many participants recognised the benefits of being able to attend an in-person appointment, for example to have more confidence in the test results, or, in the case of people with mild learning disabilities, to help them to conduct the test properly. Some participants simply valued the support of a healthcare professional.

Which aspects of the quantitative evidence were/were not explored in the qualitative studies?

The qualitative evidence did not explore the differences found between the secondary outcomes in the quantitative results. Motivational interventions found differences in attitude towards testing but not in intention to test, condom use or contact with a clinician. Tailored interventions found differences in intention to test and contact with a clinician, but not in attitude towards testing or condom use.

Which aspects of the qualitative evidence were/were not tested in the quantitative studies?

The quantitative evidence did not test findings about many of the perceived social norms around STI testing such as the sense of judgment, stigma, or embarrassment, nor did they investigate their participants' testing preferences or awareness of their STI risk in a quantifiable way. They also did not address the influence of the healthcare workers delivering the interventions or the design and presentation of the interventions, which the qualitative evidence suggested was important. The qualitative data also suggests that there may be gender differences in how people respond to the interventions, but no gender comparisons were explored in the quantitative studies. One of the qualitative papers reported on data from people with mild learning disabilities and their experiences of using remote self-sampling. The quantitative data did not allow sub-grouping of people with learning disabilities to test whether these findings were generalisable. The qualitative evidence also contained a theme about where tests were available and how they could be accessed that was not reflected in the quantitative evidence

3.2 The committee's discussion and interpretation of the evidence

The qualitative and quantitative reviews are presented as a combined discussion.

3.2.1. The outcomes that matter most

Quantitative evidence

The primary outcome as agreed with the committee in the review protocol was testing uptake. Secondary outcomes discussed were:

- Changing STI diagnosis rate
- The number of people at risk who intend to have an STI test
- Condom use
- Contact with a clinician regarding sexual health
- Attitude towards STI testing

The consensus was that the direct measure of testing uptake – the number of tests taken – was the most important outcome, and the discussion about which interventions to use was directed by the findings of it. The committee used the evidence from secondary outcomes to support the main finding but didn't use the information from them directly as they were derived from fewer studies and were less consistent in the conclusions that could be drawn.

Qualitative evidence

Qualitative outcomes were individual perspectives, experiences, values, beliefs, preferences, views and considerations that influence the acceptability of strategies to increase STI testing uptake. These outcomes covered 8 broad themes:

- Reasons for testing

- Accessibility (for people with learning disabilities)
- Intervention quality and practicalities
- Design and credibility of the intervention
- The experience of using the test
- Confidentiality and stigma
- Involvement of healthcare professionals
- Where the tests are available

The qualitative evidence was collected predominantly from younger people, aged 18-35, which may have limited the generalisability to other populations.

3.2.2 The quality of the evidence

The quantitative evidence was rated from moderate to very low confidence using the GRADE criteria: 4 meta-analyses were rated very low and 1 rated low; 2 single study comparisons were rated very low, 4 were rated low and 6 were rated moderate. The evidence for the primary outcome of testing uptake was all rated very low. The committee expressed some concerns about this and there was discussion about why the confidence ratings were not higher: the interventions were grouped into similar approaches but were not identical, therefore there was a lot of heterogeneity; the studies often had issues relating to their risk of bias since it is difficult to blind participants and researchers in these kinds of trial; and many results had large confidence intervals which indicated problems with imprecision. The committee appreciated that the GRADE assessment will give lower scores for this type of evidence as it cannot meet the standards of a classic placebo controlled double blind trial. They felt that the quality should be considered in relative rather than absolute terms for the purposes of interpretation, so did not view very low quality evidence as a barrier to making a recommendation on the interventions which found a statistically significant effect.

The committee were content with the confidence ratings given to the qualitative evidence using the GRADE-CERQUAL criteria. The majority of the 29 sub-themes were rated as high confidence (13 themes) or moderate confidence (11 themes). There were 5 themes rated as low confidence. Themes were downgraded for various reasons in each of the four GRADE-CERQUAL quality domains with either minor or moderate concerns, but with no serious concerns. See appendix F for full details.

The committee noted that the quantitative narrative findings for the use of incentives were contradictory and inconclusive. Niza 2014 supported the use of incentives, but Dolan 2014 found no significant effect of incentives, nor any differences between incentive types (e.g. vouchers, lotteries, donations). The committee did not feel able to base any recommendations on this evidence due to the low quality, but were still interested in exploring the possibility of using incentives as the qualitative evidence supported their use in some contexts.

The quantitative evidence for interventions within clinics showed no effect in a single study. The committee agreed that this was due to the particular intervention, as it was not appropriate to address the issues they were concerned about in this setting.

3.2.3 Benefits and harms

Home testing using self-sampling kits

The committee were satisfied that the evidence supports the use of remote self-sampling kits (where a person collects their own sample for laboratory analysis). The quantitative evidence found significantly higher uptake of STI testing in home self-sampling interventions compared to clinic-based testing. The qualitative evidence also found that self-sampling was well

received, provided that the sampling kit is practical, well-designed and accessible. It also indicated that this intervention was beneficial in avoiding issues around stigma and embarrassment that are common in clinic testing. The committee felt that this combination of findings provided a strong justification for recommending this intervention as an alternative to clinic attendance.

The committee agreed that the main benefit would be that it could encourage people who have previously never engaged in services to come forward for testing. However, the demand for these tests is often greater than the supply available and there is a lot of wastage as many kits are not returned. There are also unintended consequences as a result of not having direct clinic contact; the opportunity to diagnose and treat an STI and to initiate partner notification are impaired and rely on the person having the test to take the initiative. They concluded that the benefit of increased uptake would outweigh these downsides, so did not consider them an impediment to recommending this intervention.

There is regional variation in whether home tests are offered and how many are available. In locations that do offer home testing, it still cannot reach everyone who is eligible. In particular, committee members highlighted the self-efficacy needed to access, complete, and return tests and to interpret the results. They also described the specific barriers faced by gender diverse people when answering questions about sex, gender and anatomy to access an appropriate kit. To address this, they recommended ensuring services keep their websites up to date with information on local testing options and to monitor the return rates of kits to check which groups are and are not accessing them. The committee further noted the lack of specific qualitative evidence relating to the experiences and preferences of LGBT+ people in accessing STI testing services, both in clinic and remote, and made a research recommendation about it (see appendix K).

In committee members' experiences, self-sampling is suitable for chlamydia and gonorrhoea, but less so for other STIs. Tests which require a blood sample, such as syphilis tests, are more challenging to complete so are more likely to be returned in an unsuitable state for analysis. Antibodies from previous infections can also result in false positives that a clinic test would be better able to address. They concluded that self-sampling at home should be part of a suite of testing options and recommended offering it along with in-person attendance at specialist clinics or in primary care, and outreach services based on local needs. In current practice, remote self-sampling is offered only to people who are asymptomatic, so the committee also discussed the potential use of remote self-sampling for appropriate people who have symptoms. It was noted that during the COVID pandemic, some areas had offered remote self-sampling to symptomatic people following telephone triage. The committee were interested in whether this was effective and what the unintended consequences might be, so they made a research recommendation about it (see appendix K).

Tailored interventions

The quantitative evidence showed that individually tailored interventions were effective in increasing testing uptake, whereas motivational interventions without tailoring were not. The committee agreed that this was consistent with previous discussions about cultural competence in targeting interventions to specific groups, so felt confident in recommending this approach. They decided that detailed and specific tailoring used in most of the tailored intervention studies would probably be too resource intensive in practice, so recommended low-level personalisation based on elements of Kang's (2012) intervention, such as adding names (of patients or healthcare professionals) and demographic-specific information to communications (for example the local rates of STIs in their group). The qualitative evidence did not address tailored interventions, so there was no further information to support the discussion of how to tailor outreach services to specific groups or communities. As a result of this gap in the evidence, the committee made a research recommendation to explore this further. (see appendix K).

Incentives

The committee were interested in the potential of incentives, despite the weakness of the existing quantitative evidence (narrative findings from Niza 2014 and Dolan 2014 which produced conflicting results on whether incentives increased uptake; and were undertaken in specific subpopulations, for example students living in university accommodation in Niaz). They recounted anecdotal evidence of success with voucher schemes in homeless shelters and evidence from other topic areas. Some committee members expressed that vouchers intuitively felt like a better incentive than a lottery, regardless of Dolan 2014 finding no differences in incentive types. They suggested that incentives should not necessarily be disregarded when they seem to work in reality while weaknesses in the design and analysis of the studies may have accounted for the ambiguity of the results.

There were, however, concerns about ethical issues, particularly for those who are financially vulnerable; incentive schemes could constitute a perverse incentive, encouraging people to expose themselves to STI risks in order to be eligible to claim the incentive. The committee agreed that the type of incentive offered is an important consideration. Some committee members suggested non-financial incentives such as virtual badges to indicate STI testing status on dating apps as a way to avoid the potential problems of financial perverse incentives. There are also unintended consequences to STI testing: the procedure itself, taking blood, the risk of false positives, and anxiety while waiting for results. While increased testing is a good thing, excessive or unnecessary testing to gain incentives is not desirable. As there is currently a lack of high quality quantitative evidence to support the use of incentives and little consideration of the possible unintended consequences, the committee made a research recommendation to explore these further (see appendix K)

3.2.4 Cost effectiveness and resource use

The committee noted there were a number of published cost-effectiveness analyses for this review question, which were of reasonable quality and applicability to the UK. However, there were two key limitations that meant they did not feel confident making recommendations directly based off those studies. First, many of the studies looked at issues that would fall within the remit of the National Chlamydia Screening Programme. The committee considered whether those findings could be extrapolated to other STIs or settings, but considered that the existence of the screening programme means services (for those eligible under it) are set up in a somewhat different way to other services, and therefore are not particular generalisable. Other studies looked at very specifically targeted interventions (for example, testing in football clubs) and the committee agreed this was better covered in more general recommendations elsewhere in the guidance about providing a range of services, and targeting to the needs of specific populations, rather than by listing any of these specific individual cases within the recommendations.

The committee made two sets of recommendations from this evidence review. The first set, on tailoring interventions, the committee were confident would not have a significant resource impact, due to the low complexity of the things being recommended. For the second area, on remote self-sampling as a method of STI testing for asymptomatic people, the committee noted that widespread adoption of this would come with significant implications for the restructuring of services, and therefore agreed cost-effectiveness modelling in this area would provide value.

The model built compared a system of solely in clinic STI testing to a system where remote (in particular at home) self-sampling is available. It looked at the benefits of additional identified cases, both for reducing long-term complications in the index-cases identified, and in reducing onward transmission and secondary cases. The analysis covered a range of bacterial STIs (chlamydia, gonorrhoea and syphilis) and looked both at the general population accessing STI testing, and at specific high-risk subgroups (defined by a higher baseline prevalence of STIs).

The modelling found that, assuming self-sampling interventions were as effective in real world settings as in the identified RCTs, offering this as an intervention would be highly cost-effective, with the additional costs generated by the higher volume of tests requested generating considerable additional QALYs, as well as some downstream savings from prevented complications and secondary infections. Data to populate the analysis for the high-risk subgroups was extremely limited, but what was available suggested the intervention would be either approximately equally or most cost-effective in these populations compared to the general population, and therefore the committee were confident in making recommendations covering the whole population, and that these would also be appropriate for these subpopulations.

The committee did note, however, that there were a number of potential risks in widescale implementation of self-sampling that might make it less cost-effective than in trial settings. These would include people requesting and not returning tests, people providing unusable test samples and therefore requiring retesting, and the potential need for confirmatory clinical tests in people with a positive self-sampling test (particular for syphilis testing). Additionally, there is possibility that the availability of self-sampling means lower risk individuals decide to get tested, resulting in a lower test positive rate, reducing the cost-effectiveness of the intervention. The committee noted the impact of these issues will have been captured in the RCT results as far as they happened in those trials, but agreed that in principle there was a risk that the additional information provided and monitoring undertaken during a trial would mean they may not exist to the same extent as when rolled out more widely. A series of sensitivity analyses were conducted (using data from UK routine practice on these factors where available), which showed that when multiple of these more negative assumptions were made simultaneously, there were scenarios in which offering home self-sampling was no longer cost-effective. The committee noted these analyses were likely to be somewhat biased against self-sampling, due to the risk of double counting issues (for example, applying the general UK rate of non-returned tests on top of the unreturned tests already accounted for in the trial), but felt they were still useful as a way of testing the robustness of the conclusions.

The committee considered these findings and decided they were still confident in recommending self-sampling should be available as a testing method. They noted that it was still relatively recently widespread use of these interventions had been made in the UK, and therefore the data at the moment likely reflected teething issues in the setup of services, and improvements were likely as services became more established. Second, they noted that many of these factors were not inevitable results of having a self-sampling service, but rather modifiable parameters that services could look to improve. Therefore, alongside their recommendations that self-sampling be available as a testing methods, they also made implementation recommendations, such as for services to monitor return rates of kits, and to improve the accessibility and usability of those kits, all of which would be expected to improve rates of correct test returns, and therefore improve the cost-effectiveness of the intervention.

The committee noted there had been a considerable increase in remote self-sampling services as a result of the COVID-19 pandemic, but noted in many cases these had been offered instead of in clinic services (with those not being available), rather than as a choice alongside in clinic testing as this guideline recommends as a long-term model. However, this does mean that many services now have increased familiarity with and systems for remote self-sampling, and therefore the implementation barriers to this change should be considerably lower than they would have been if implemented before the onset of the pandemic.

3.2.5 Other factors the committee took into account

The impact of Covid 19 self-sampling

All studies included in the review were conducted prior to the Covid 19 pandemic, so the committee were interested in how people's behaviour and attitudes may have changed as a result of it. Familiarity and experience with self-swab testing at home will have increased considerably as a result of widespread covid testing, thereby normalising the procedure. In addition, some areas introduced or expanded self-testing for STIs during the pandemic due to service restrictions whereby asymptomatic screening was not available in clinics. Committee members observed that the acceptance of home-testing and self-testing had increased considerably, and that online testing services had been well received during this period. They cautioned, however, that this increase was mainly people who were seeking testing services, rather than reaching people who would not have otherwise come forward for testing. It is also likely that there were some people who declined to use this service if they had wanted an in-clinic test. The committee considered the possibility that a change in acceptance of self-sampling may be short lived if covid becomes less prevalent and noted that frequent covid testing is not directly comparable to frequent STI testing. They made a research recommendation to explore this further (see appendix K).

Informed consent and profiling

Some self-sampling interventions in the quantitative evidence used 'pop-up' outreach campaigns to distribute kits to people who may not have sought out testing, particularly targeting hard to reach groups. The committee discussed the ethics and impact of targeting specific demographics for testing and of offering testing to these people in non-clinical settings without fully explaining why it was offered. It was suggested that there may be a lack of informed consent if people are not aware of the implications for themselves and their sexual partners. The qualitative evidence provided a mixture of views on this issue; some found it invasive and inappropriate to be offered testing in this way, while others appreciated the convenience and ease of testing being brought to them. The committee concluded that the opportunity to widen access to testing justified recommending offering self-sampling kits through outreach services.

There were also concerns raised by the qualitative finding that some young people may object to being profiled as high risk, particularly in GP settings where being approached for STI testing could distract from the purpose of their appointment. Similarly, there are also potential issues around pathologising gay, bisexual and other men who have sex with men by profiling them as high risk. Committee members pointed out that it is commonplace in public health to target groups and to profile people who are at higher risk of poor health. For this reason, the focus should be how to offer testing appropriately so that people understand why they have been offered it; they recommended recognising concerns about profiling and addressing the issue with cultural sensitivity and competency The committee further noted that targeting interventions to at-risk groups can also be achieved by making services more accessible, by addressing the needs of trans and gender diverse people, being available in different languages or being available in different formats such as videos targeted at people with learning difficulties.

Types of tests and terminology

Members of the committee explained the distinction between self-sampling (which can either be in clinic or out of clinic), remote self-sampling (where a self-sample is taken at home or in another non-clinical setting and sent for analysis), and home testing (where the sample and test are conducted by the person outside of the clinic). These terms had been used somewhat interchangeably in the evidence so they felt it was important to be clear that the intervention supported by the quantitative evidence was self-sampling at home and the interventions described in the qualitative evidence were self-sampling at home or other non-clinic locations.

There was discussion around what tests are available and appropriate. Although the qualitative evidence indicated that people would prefer a choice about what type of test they are offered and would often prefer a rapid test, this may not be possible in practice. It was pointed out that rapid point of care tests are not yet available for most STIs (they are currently used for HIV). The committee recounted that swabs and urine samples were rarely refused, whereas it can be difficult to persuade people to accept a blood test. This aspect of testing uptake was missing from most of the interventions in the review, so was considered for a research recommendation but not prioritised as the committee preferred to focus on increasing uptake overall. Lastly, it was commented that testing options are not equally effective, for example urine sampling is less sensitive than vulvo-vaginal swab tests for women, therefore offering more choice of testing options may be counter-productive to increasing detection of STIs and should not be recommended.

3.3 Recommendations supported by this , review

This evidence review supports recommendations 1.2.1 to 1.2.9 and the research recommendations on the value of incentives in increasing STI testing, attitudes to remote self-sampling and regular STI testing, the effectiveness and adverse outcomes of self-sampling for people with symptoms, and the experiences of LGBT+ people in accessing STI testing services.

3.4 References – included studies

3.4.1 Effectiveness

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Roth, Alexis M, Van Der Pol, Barbara, Fortenberry, J Dennis et al. (2015) The impact of brief messages on HSV-2 screening uptake among female defendants in a court setting: a randomized controlled trial utilizing prospect theory. Journal of health communication 20(2): 230-6

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3.4.3 Economic

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Appendices

Appendix A – Review protocols

Review protocol for effectiveness and cost effectiveness of strategies to improve uptake of STI testing

ID	Field	Content
0.	PROSPERO registration number	CRD42021240476
1.	Review title	Effective and cost-effective strategies to improve uptake of STI testing
2.	Review question	What strategies to improve the uptake of STI testing (excluding HIV testing) are effective and cost-effective?
3.	Objective	STI testing, diagnosis and treatment are central to STI prevention strategies. The purpose of this review is to establish which strategies or interventions for increasing the uptake of STI testing are effective and cost effective.
4.	Searches	The following databases will be searched: • Cochrane Central Register of Controlled Trials (CENTRAL) • Cochrane Database of Systematic Reviews (CDSR) • Embase (OVID) • Medline (OVID) • Medline in Process (OVID) • PsycINFO (Ovid) • EmCare (OVID) • Web of Science (for citation searching* only, if judged to be required) *Citation searching Depending on initial database results, forward citation searching on key papers may be

		conducted, if judged necessary, using Web of Science (WOS). Only those references which NICE can access through its WOS subscription would be added to the search results. Duplicates would be removed in WOS before downloading. Websites 5 key websites will be searched for relevant reports or publications Database functionality will be used, where available, to exclude: • Non-English language papers • Animal studies • Editorials, letters or commentaries • Conference abstracts or posters • Dissertations or theses • Duplicates Sources will be searched from 2010 to current. The searches will be re-run 6 weeks before final submission of the review and further studies retrieved for inclusion. The guidance Information Services team at NICE will quality assure the principal search strategy and peer review the strategies for the other databases. Any revisions or additional steps will be agreed by the review team before being implemented. Any deviations and a rationale for them will be recorded alongside the search strategies. A record will be kept of number of records found from each database and of the strategy used in each database. A record will be kept of total number of duplicates found and of total results provided to the Public Health team.

5.	Condition or domain being studied	Sexually transmitted infections including genital herpes, chlamydia, genital warts, gonorrhoea, syphilis, *Mycoplasma genitalium, Lymphogranuloma venereum* (LGV), *Trichomonas vaginalis* (TV)
6.	Population	Sexually active people from age 16. This will include younger people who contact or use sexual health services and are considered to be Gillick competent and satisfies the Fraser guidelines
7.	Intervention/Exposure/Test	Interventions or strategies that have a stated primary aim of improving the uptake of STI testing (excluding HIV testing), including but not limited to: **Healthcare settings** • Opportunistic STI testing during healthcare consultations that are not specifically related to sexual health • Opportunistic testing within reproductive health and termination of pregnancy services • STI point of care tests, including rapid turnaround diagnostics • Education based interventions • Email invites for testing • Text messaging invites for testing • Changes in service provision and delivery that may improve access to sexual health services and testing accessibility such as reduced waiting times, extended clinic opening hours, walk-in clinics, short notice

		appointments, appointment booking systems, and whether services meet 'You're Welcome' youth friendly quality criteria. • Testing services delivered in spoke or satellite clinics. • Remote service delivery or telephone and/or video consultations (e.g. skype, GP at Hand, PushDoctor, Dr Thom) **Non healthcare settings** • Online testing services • STI self-sampling and/or self-testing kits • Testing services delivered in non-clinical community settings such as voluntary or community organisations or in prisons • Testing services delivered in outreach settings such as bars, clubs, faith-based settings, saunas, sex on premises venues • Social media invites or advertisements for STI testing (including dating apps and 'influencers') **Excluded:** Interventions where the primary objective is not specifically to increase the uptake of STI testing Interventions designed to improve the uptake of HIV testing, Hepatitis B or Hepatitis C Interventions designed to improve the uptake of STI vaccinations (e.g. HPV, Hepatitis A and Hepatitis B vaccinations). Interventions relating to partner notification strategies. Condom distribution schemes.

		Clinical interventions for the diagnosis, treatment or management of STIs. Interventions delivered in schools. Interventions directed at parents or carers
8.	Comparator/Reference standard/Confounding factors	• Another intervention • No intervention
9.	Types of study to be included	**Inclusion:** **Effectiveness studies:** • RCTs and cluster RCTs • Systematic reviews of included study designs **Exclusion:** • Controlled before-and-after studies • Cohort studies • Case control studies • Cross-sectional studies • Correlational studies • Non-randomised controlled trials
10.	Other exclusion criteria	Only papers published in the English language will be included Only full published peer-reviewed studies (not protocols or summaries) will be included. Dissertations or theses will be excluded. Only studies carried out in the UK will be included for the healthcare setting interventions Only OECD countries will be included for the non-healthcare setting interventions.
11.	Context	The Department of Health and Social Care in England has asked NICE to update the guideline on sexually transmitted infections and under-18 conceptions: prevention (PH3), published in 2007. Changes in policy and commissioning, financial pressures and new evidence identified through the surveillance process led to the decision to update this guideline. The updated guideline will focus solely on the reduction of sexually transmitted

		infections (STIs), as prevention of under-18 conceptions is covered in other guidelines. Data from Public Health England show the overall number of STI diagnoses increased by 5% between 2018 and 2019. STIs can affect personal wellbeing, mental health and relationships and can also lead to serious health problems including pelvic inflammatory disease, ectopic pregnancy or infertility. It is therefore important to address interventions to help prevent or reduce STIs.
12.	Primary outcomes (critical outcomes)	• Uptake of STI testing
13.	Secondary outcomes (important outcomes)	Safety or adverse effects Unintended consequences (e.g. availability of STI testing appointments, waiting time for diagnosis and/or treatment) Awareness of STI testing and testing services Changing STI diagnosis rate The number of people at risk who intend to have an STI test Condom use
14.	Data extraction (selection and coding)	All references identified by the searches and from other sources will be uploaded into EPPI reviewer and de-duplicated. This review will use the EPPI reviewer priority screening functionality where at least 50% of the identified abstracts (or 1000 records, if that is a greater number) will be screened. After this point, screening will only be terminated if a pre-specified threshold is met for a number of abstracts being screened without a single new

		include being identified. This threshold is 500 records. A random 10% sample of the studies remaining in the database when the threshold is met will be additionally screened, to check if a substantial number of relevant studies are not being correctly classified by the algorithm, with the full database being screened if concerns are identified. 10% of the abstracts will be reviewed by two reviewers, with any disagreements resolved by discussion or, if necessary, a third independent reviewer. The full text of potentially eligible studies will be retrieved and will be assessed in line with the criteria outlined above. A standardised template will be used to extract data from studies (this is consistent with the Developing NICE guidelines: the manual section 6.4). Details of the intervention will be extracted using the TIDieR checklist in EPPI. The additional checks that are used to ensure that relevant records are not missed will be applied. These include checking reference lists of included systematic reviews (even if these are not used as a primary source of data) and checking with the PHAC that they are not aware of any relevant studies that have been missed.
15.	Methodological (quality) assessment	Risk of bias for individual studies will be assessed using the appropriate checklist as described in Developing NICE guidelines: the manual. For systematics reviews, ROBIS will be used. For individual RCTs and cluster RCTs, the Cochrane risk of bias tool 2.0 will be used.
16.	Strategy for data synthesis	Studies will be grouped by intervention type as appropriate. Data from eligible studies will be meta-analysed (combined) if studies are judged to be similar

		enough in terms of population, interventions, outcomes, study design or risk of bias. It is anticipated that meta-analysed studies will be heterogeneous. Where appropriate, heterogeneity will be explored by conducting subgroup analyses and incorporated by performing random-effect analyses. If studies are found to be too heterogeneous to be pooled statistically, a narrative approach with sufficient information to make judgements about study effectiveness will be conducted. Tables and other forms of visual presentation will be used to summarise data where appropriate. Dichotomous data will be pooled where appropriate and the effect size will be reported using risk ratios in a standard pair-wise meta-analysis. Continuous outcomes reported on the same scale will be pooled in a standard pair-wise meta-analysis using mean difference where possible. Continuous outcomes not reported on the same scale will be pooled using a standardised mean difference in a standard pair-wise meta-analysis. The quality or certainty across all available evidence will be evaluated for each outcome using an the 'Grading of Recommendations Assessment, Development and Evaluation (GRADE) toolbox' developed by the international GRADE working group http://www.gradeworkinggroup.org/
17.	Analysis of sub-groups	Where evidence allows, sub-group analysis will be conducted to include those disproportionately burdened with STIs, including: • Young people age 16 to 24 years • Men who have sex with men • People from a Black African or Caribbean family background • People engaging in so-called chemsex

		• People with low socioeconomic status • Trans and non-binary people • People from migrant communities • People with learning disabilities • People age 65 years and older • People using HIV PrEP Where evidence allows, sub-group analyses may be used to answer questions about the effectiveness of intervention types, including: - The format of digitally delivered testing invites or reminders - The content of digitally delivered testing invites or reminders - Whether testing invites or reminders are tailored or targeted
18.	Type and method of review	☒ Intervention ☐ Diagnostic ☐ Prognostic ☐ Qualitative ☐ Epidemiologic ☐ Service Delivery ☐ Other (please specify)
19.	**Language**	English
20.	**Country**	England
24.	**Named contact**	**5a. Named contact** Public Health Guideline Development Team **5b Named contact e-mail** enquiries@nice.org.uk **5c Named contact address** National Institute for Health and Care Excellence 10 Spring Gardens London SW1A 2BU **5d Named contact phone number** +44 (0)300 323 0148

		5e Organisational affiliation of the review National Institute for Health and Care Excellence (NICE) and NICE Public Health Guideline Development Team.
25.	**Review team members**	From the Centre for Guidelines: • Chris Carmona, Hugh McGuire, Robby Ritchie • Hannah Stockton, Michellie Young, James Jagroo, Jonathan Nyong. • Joshua Pink • Daniel Tuvey
26.	**Funding sources/sponsor**	This systematic review is being completed by the Centre for Guidelines which receives funding from NICE.
27.	**Conflicts of interest**	All guideline committee members and anyone who has direct input into NICE guidelines (including the evidence review team and expert witnesses) must declare any potential conflicts of interest in line with NICE's code of practice for declaring and dealing with conflicts of interest. Any relevant interests, or changes to interests, will also be declared publicly at the start of each guideline committee meeting. Before each meeting, any potential conflicts of interest will be considered by the guideline committee Chair and a senior member of the development team. Any decisions to exclude a person from all or part of a meeting will be documented. Any changes to a member's declaration of interests will be recorded in the minutes of the meeting. Declarations of interests will be published with the final guideline.
28.	**Collaborators** NB: This section within PROSPERO does not have free text option. Names of committee members to be inserted individually by the project manager and any additional collaborators	Development of this systematic review will be overseen by an advisory committee who will use the review to inform the development of evidence-based recommendations in line with section 3 of Developing NICE guidelines: the manual. Members of the guideline committee are available on the NICE website

29.	**Other registration details** (50 words)	
30.	**Reference/URL for published protocol**	
31.	**Dissemination plans**	NICE may use a range of different methods to raise awareness of the guideline. These include standard approaches such as: • notifying registered stakeholders of publication • publicising the guideline through NICE's newsletter and alerts • issuing a press release or briefing as appropriate, posting news articles on the NICE website, using social media channels, and publicising the guideline within NICE.
32.	**Keywords**	
33.	**Details of existing review of same topic by same authors** (50 words)	
34.	**Current review status**	☐ Ongoing ☒ Completed but not published ☐ Completed and published ☐ Completed, published and being updated ☐ Discontinued
35..	**Additional information**	
36.	**Details of final publication**	https://www.nice.org.uk/

Review protocol for Reducing STIs RQ 2.2 Acceptability of strategies to improve uptake of STI testing

ID	Field	Content
0.	PROSPERO registration number	CRD42021240854
1.	Review title	Acceptability of strategies to improve uptake of STI testing.
2.	Review question	What factors influence the acceptability of the strategies used to improve the uptake of STI testing?
3.	Objective	STI testing, diagnosis and treatment are central to STI prevention strategies. The purpose of this review is to establish the acceptability of strategies for improving the uptake of STI testing.
4.	Searches	The following databases will be searched: • Cochrane Central Register of Controlled Trials (CENTRAL) • Cochrane Database of Systematic Reviews (CDSR) • Embase (OVID) • Medline (OVID) • Medline in Process (OVID) • PsycINFO (Ovid) • EmCare (OVID) • Web of Science (for citation searching* only, if judged to be required) *Citation searching Depending on initial database results, forward citation searching on key papers may be conducted, if judged necessary, using Web of Science (WOS). Only those references which NICE can access through its WOS subscription would be added to the search results. Duplicates would be removed in WOS before downloading. Websites 5 key websites will be searched for relevant reports or publications

		Database functionality will be used, where available, to exclude: • Non-English language papers • Animal studies • Editorials, letters or commentaries • Conference abstracts or posters • Dissertations or theses • Duplicates Sources will be searched from 2010 to current. The searches will be re-run 6 weeks before final submission of the review and further studies retrieved for inclusion. The guidance Information Services team at NICE will quality assure the principal search strategy and peer review the strategies for the other databases. Any revisions or additional steps will be agreed by the review team before being implemented. Any deviations and a rationale for them will be recorded alongside the search strategies. A record will be kept of number of records found from each database and of the strategy used in each database. A record will be kept of total number of duplicates found and of total results provided to the Public Health team.
5.	Condition or domain being studied	Sexually transmitted infections including genital herpes, chlamydia, genital warts, gonorrhoea, syphilis, *Mycoplasma genitalium, Lymphogranuloma venereum* (LGV), *Trichomonas vaginalis* (TV)
6.	Population	Sexually active people from age 16. This will include younger people who contact or use sexual health services and are considered to be Gillick competent and satisfies the Fraser guidelines
7.	Intervention/Exposure/Test	Factors that influence the acceptability of the strategies for improving testing uptake in individuals who are the target of these strategies (This will include interventions or strategies identified in RQ2.1, but is not restricted to these)

8.	Comparator/Reference standard/Confounding factors	Not applicable
9.	Types of study to be included	Qualitative studies, such as questionnaires using open ended questions, structured or semi-structured interviews, focus groups. Mixed method studies with qualitative data, where the qualitative evidence meets specified inclusion criteria and can be extracted.
10.	Other exclusion criteria	Only papers published in the English language will be included Only full published peer-reviewed qualitative studies will be included. Only studies carried out in the UK will be included.
11.	Context	The Department of Health and Social Care in England has asked NICE to update the guideline on sexually transmitted infections and under-18 conceptions: prevention (PH3), published in 2007. Changes in policy and commissioning, financial pressures and new evidence identified through the surveillance process led to the decision to update this guideline. The updated guideline will focus solely on the reduction of sexually transmitted infections (STIs), as prevention of under-18 conceptions is covered in other guidelines Data from Public Health England show the overall number of STI diagnoses increased by 5% between 2018 and 2019. STIs can affect personal wellbeing, mental health and relationships and can also lead to serious health problems including pelvic inflammatory disease, ectopic pregnancy or infertility. It is therefore important to address interventions to help prevent or reduce STIs.
12.	Primary outcomes (critical outcomes)	Outcomes will include individual perspectives, experiences, values, beliefs, preferences, views and considerations that influence the acceptability of the strategies.

13.	Secondary outcomes (important outcomes)	Not applicable
14.	Data extraction (selection and coding)	All references identified by the searches and from other sources will be uploaded into EPPI reviewer and de-duplicated. This review will use the EPPI reviewer priority screening functionality. At least 50% of the identified abstracts will be screened. After this point, screening will only be terminated if a pre-specified threshold is met for a number of abstracts being screened without a single new include being identified. This threshold is 500 records. A random 10% sample of the studies remaining in the database when the threshold is met will be additionally screened, to check if a substantial number of relevant studies are not being correctly classified by the algorithm, with the full database being screened if concerns are identified. 10% of the abstracts will be reviewed by two reviewers, with any disagreements resolved by discussion or, if necessary, a third independent reviewer. The full text of potentially eligible studies will be retrieved and will be assessed in line with the criteria outlined above. A standardised template will be used to extract data from studies (this is consistent with the Developing NICE guidelines: the manual section 6.4).
15.	Methodological (quality) assessment	Risk of bias will be assessed using the appropriate checklist as described in Developing NICE guidelines: the manual The CASP qualitative checklist will be used. This includes determining if the study is considered to be at low, moderate or high risk of bias.
16.	Strategy for data synthesis	The key findings from the studies will be categorised into themes relevant to the

		review across all studies using a thematic analysis. Supporting quotations and summaries of data will be included. Descriptive themes will be identified, and the third order interpretation themes and sub themes will be reviewed specifically relating to the aims of this review question. These will be further discussed with in the technical team to ensure agreement across the themes. The quality or certainty across all available evidence will be evaluated for each outcome using the GRADE CERQual approach. Evidence from the qualitative study designs is initially rated as high confidence and the confidence in the evidence for each theme will be downgraded from this initial point. A mixed methods synthesis including studies from question 2.1 will be used. An integration approach will be used to consider the combination of the quantitative and qualitative findings, where sufficient data has been found in this review. This will be completed sequentially; this will consider the results of the quantitative review and how the findings form the qualitative review might inform or explain this. Where evidence allows, a synthesis matrix will be produced to combine results from the two different analytical approaches. Findings from one analytical approach will be compared to findings from the second approach, and outcomes paired up if they provide relevant information on the same underlying topic (for example, acceptability factors may be paired up with interventions from 2.1). The agreement between the findings of the two approaches will be qualitatively assessed, with each paired set of findings put into categories relating to the strength of the identified correlation. The results will be presented as a narrative summary or if there is sufficient data, then as a diagram with quantitative findings mapped

		onto the qualitative ones. This approach will inform the discussion of the quantitative and qualitative review.
17.	Analysis of sub-groups	Where evidence allows, sub-group thematic analysis will be conducted to include those disproportionately burdened with STIs, including: • Young people age 16 to 24 years • Men who have sex with men • People from a Black African or Caribbean family background • Trans and non-binary people • People with low socioeconomic status • People with learning disabilities • Older adults • Migrant communities • Those taking HIV PrEP
18.	Type and method of review	☐ Intervention ☐ Diagnostic ☐ Prognostic ☒ Qualitative ☐ Epidemiologic ☐ Service Delivery ☐ Other (please specify)
19.	**Language**	English
20.	**Country**	England
24.	**Named contact**	**5a. Named contact** Public Health Guideline Development Team **5b Named contact e-mail** enquiries@nice.org.uk **5c Named contact address** National Institute for Health and Care Excellence 10 Spring Gardens London SW1A 2BU **5d Named contact phone number**

		+44 (0)300 323 0148 **5e Organisational affiliation of the review** National Institute for Health and Care Excellence (NICE) and NICE Public Health Guideline Development Team.
25.	**Review team members**	From the Centre for Guidelines: • Chris Carmona, Hugh McGuire, Robby Ritchie • Hannah Stockton, Michellie Young, James Jagroo, Jonathan Nyong. • Joshua Pink • Daniel Tuvey
26.	**Funding sources/sponsor**	This systematic review is being completed by the Centre for Guidelines which receives funding from NICE.
27.	**Conflicts of interest**	All guideline committee members and anyone who has direct input into NICE guidelines (including the evidence review team and expert witnesses) must declare any potential conflicts of interest in line with NICE's code of practice for declaring and dealing with conflicts of interest. Any relevant interests, or changes to interests, will also be declared publicly at the start of each guideline committee meeting. Before each meeting, any potential conflicts of interest will be considered by the guideline committee Chair and a senior member of the development team. Any decisions to exclude a person from all or part of a meeting will be documented. Any changes to a member's declaration of interests will be recorded in the minutes of the meeting. Declarations of interests will be published with the final guideline.
28.	**Collaborators** NB: This section within PROSPERO does not have free text option. Names of committee members to be inserted individually by the project manager and any additional collaborators	Development of this systematic review will be overseen by an advisory committee who will use the review to inform the development of evidence-based recommendations in line with section 3 of Developing NICE guidelines: the manual. Members of the guideline committee are available on the NICE website.
29.	**Other registration details** (50 words)	

30.	**Reference/URL for published protocol**	
31.	**Dissemination plans**	NICE may use a range of different methods to raise awareness of the guideline. These include standard approaches such as: • notifying registered stakeholders of publication • publicising the guideline through NICE's newsletter and alerts • issuing a press release or briefing as appropriate, posting news articles on the NICE website, using social media channels, and publicising the guideline within NICE.
32.	**Keywords**	
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35..	**Additional information**	
36.	**Details of final publication**	https://www.nice.org.uk/

Appendix B – Literature search strategies

For full search strategies see the search chapter on the guideline webpage.

Medline search strategy for RQ 2.1 and 2.2

1	Herpes Genitalis/ or Herpes Simplex/
2	((genital* or simplex*) adj3 herpes*).ti,ab.
3	chlamydia*.ti,ab.
4	Chlamydia Infections/ or Chlamydia/ or Chlamydia trachomatis/
5	((genital* or anogenital* or ano-genital* or venereal*) adj3 wart*).ti,ab.
6	Condylomata Acuminata/
7	"condylomata acuminata".ti,ab.
8	Gonorrhea/
9	(Gonorrhea* or Gonorrhoea*).ti,ab.
10	Syphilis/
11	syphilis*.ti,ab.
12	(lymphogranuloma venereum or lgv).ti,ab.
13	Lymphogranuloma Venereum/
14	Trichomonas vaginalis/
15	(trichomonas vaginali* or Trichomoniasi*).ti,ab.
16	Trichomonas Infections/
17	(mycoplasma genitalium or Mgen).ti,ab.
18	Mycoplasma genitalium/
19	Sexually Transmitted Diseases/
20	((sexually adj2 transmit* adj2 (disease* or infection*)) or sti or std).ti,ab.
21	(venereal* adj2 (disease* or infection*)).ti,ab.
22	or/1-21
23	Papillomavirus Infections/
24	(papillomavirus adj (human* or infect*)).ti,ab.
25	hpv.ti,ab.
26	or/23-25
27	gay*.ti,ab.

28 Homosexuality, Male/

29 "Sexual and Gender Minorities"/

30 Bisexuality/

31 Transgender Persons/ or Transsexualism/ or Transgender/ or Health Services for Transgender Persons/

32 Homosexuality/

33 men who have sex with men.ti,ab.

34 (same sex or non heterosexual* or non-heterosexual*).ti,ab.

35 MSM.ti,ab.

36 (transgend* or transex* or transsex* or transma* or transmen* or trans man or trans men or trans masculine or transfem* or transwom* or trans woman or trans women or transperson* or transpeopl* or trans person* or trans people* or (gender adj (queer* or fluid* or variant*)) or nonbinary or non binary or non-binary or genderless or genderqueer* or agender or bi-gender or bi gender or neutrois or crossgender* or cross-gender* or crossex* or cross-sex*).ti,ab.

37 (bisexual* or homosexual* or lgbt*).ti,ab.

38 ((male or man or men or boy*) adj3 (sex work* or prostitut* or transactional sex or escort*)).ti,ab.

39 ((teen* or adolescent*) adj4 (boy* or male* or man or men)).ti,ab.

40 (over adj2 (sixteen* or "16") adj2 (year or years or age or ages or aged) adj2 (boy* or male*)).ti,ab.

41 ((male* or boy*) adj2 (16-17 or 16-18 or 16-19 or 17-18 or 17-19) adj2 (year or years or age or ages or aged)).ti,ab.

42 or/27-41

43 26 and 42

44 22 or 43

45 ((test or tests or testing or tested or screen*) adj3 (uptake or take up or increas* or decreas* or reduc* or impact* or effect* or improve* or enhanc* or encourag* or support* or promot* or optim* or adher* or access* or motivat* or accept* or satisfaction or compliance or comply or complie* or refus* or availab* or provision or provid* or offer or incentiv* or barrier* or challeng* or attend* or service*)).ti,ab.

46 ((test or tests or testing or tested or screen*) adj4 (opportunistic or point of care or point-of-care or "point of care")).ti,ab.

47 ((test or tests or testing or tested or screen*) adj4 (invit* or invitation* or advert* or advertisement*)).ti,ab.

48 ((test or tests or testing or tested or screen*) adj4 access*).ti,ab.

49 ((test or tests or testing or tested or screen*) adj4 (outreach* or satellite clinic* or bespoke clinic* or remote clinic* or video consult* or teleconsult* or telephone consult* or phone consult* or skype* or zoom* or "youre welcome" or "GP at Hand" or "Push Doctor" or "Dr Thom" or kit* or home*)).ti,ab.

50 ((test or tests or testing or tested or screen*) adj4 (walk in or walk-in or "walk in")).ti,ab.

51 ((test or tests or testing or tested or screen) adj4 (wait* time* or open* hour* or appointment* or book* system*)).ti,ab.

52 ((test or tests or testing or tested or screen*) adj4 (mass or countr* or universal or population or national* or public health) adj4 (promotion* or campaign* or intervention* or toolkit* or strateg*)).ti,ab.

53 (awareness adj4 (rais* or promotion* or campaign* or intervention* or toolkit* or strateg*) adj4 (test or tests or testing or tested or screen*)).ti,ab.

54 ((test or tests or testing or tested or screen*) adj4 (poster* or leaflet* or booklet* or presentation* or brochure* or flyer* or newsletter* or radio or tv or television or article* or factsheet* or magazine* or literature or display* or card* or banner* or t-shirt* or internet* or digital* or electronic* or computer* or advert* or campaign* or app or apps or "dating app*" or "dating site*" or "dating website*" or "online dating" or blog* or website* or online or social media or social market* or facebook or twitter or instagram or snapchat or video* or messag* or email* or text* or sms or smartphone* or mobile* or phone* or "tablet computer*" or workshop* or train* or remote or communit*) adj2 (public health or promot*)).ti,ab.

55 Diagnostic Tests, Routine/ or Mass Screening/

56 or/45-55

57 44 and 56

58 afghanistan/ or africa/ or africa, northern/ or africa, central/ or africa, eastern/ or "africa south of the sahara"/ or africa, southern/ or africa, western/ or albania/ or algeria/ or andorra/ or angola/ or "antigua and barbuda"/ or argentina/ or armenia/ or azerbaijan/ or bahamas/ or bahrain/ or bangladesh/ or barbados/ or belize/ or benin/ or bhutan/ or bolivia/ or borneo/ or "bosnia and herzegovina"/ or botswana/ or brazil/ or brunei/ or bulgaria/ or burkina faso/ or burundi/ or cabo verde/ or cambodia/ or cameroon/ or central african republic/ or chad/ or exp china/ or comoros/ or congo/ or cote d'ivoire/ or croatia/ or cuba/ or "democratic republic of the congo"/ or cyprus/ or djibouti/ or dominica/ or dominican republic/ or ecuador/ or egypt/ or el salvador/ or equatorial guinea/ or eritrea/ or eswatini/ or ethiopia/ or fiji/ or gabon/ or gambia/ or "georgia (republic)"/ or ghana/ or grenada/ or guinea/ or guinea-bissau/ or guyana/ or haiti/ or honduras/ or independent state of samoa/ or exp india/ or indian ocean islands/ or indochina/ or indonesia/ or iran/ or iraq/ or jamaica/ or jordan/ or kazakhstan/ or kenya/ or kosovo/ or kuwait/ or kyrgyzstan/ or laos/ or lebanon/ or liechtenstein/ or lesotho/ or liberia/ or libya/ or madagascar/ or malaysia/ or malawi/ or mali/ or malta/ or mauritania/ or mauritius/ or mekong valley/ or melanesia/ or micronesia/ or monaco/ or mongolia/ or montenegro/ or morocco/ or mozambique/ or myanmar/ or namibia/ or nepal/ or nicaragua/ or niger/ or nigeria/ or oman/ or pakistan/ or palau/ or exp panama/ or papua new guinea/ or paraguay/ or peru/ or philippines/ or qatar/ or "republic of belarus"/ or "republic of north macedonia"/ or romania/ or exp russia/ or rwanda/ or "saint kitts and nevis"/ or saint lucia/ or "saint vincent and the grenadines"/ or "sao tome and principe"/ or saudi arabia/ or serbia/ or sierra leone/ or senegal/ or seychelles/ or singapore/ or somalia/ or south africa/ or south sudan/ or sri lanka/ or sudan/ or suriname/ or syria/ or taiwan/ or tajikistan/ or tanzania/ or thailand/ or timor-leste/ or togo/ or tonga/ or "trinidad and tobago"/ or tunisia/ or turkmenistan/ or uganda/ or ukraine/ or united arab emirates/ or uruguay/ or uzbekistan/ or vanuatu/ or venezuela/ or vietnam/ or west indies/ or yemen/ or zambia/ or zimbabwe/

59 "organisation for economic co-operation and development"/

60 australasia/ or exp australia/ or austria/ or baltic states/ or belgium/ or exp canada/ or chile/ or colombia/ or costa rica/ or czech republic/ or exp denmark/ or estonia/ or europe/ or

finland/ or exp france/ or exp germany/ or greece/ or hungary/ or iceland/ or ireland/ or israel/ or exp italy/ or exp japan/ or korea/ or latvia/ or lithuania/ or luxembourg/ or mexico/ or netherlands/ or new zealand/ or north america/ or exp norway/ or poland/ or portugal/ or exp "republic of korea"/ or "scandinavian and nordic countries"/ or slovakia/ or slovenia/ or spain/ or sweden/ or switzerland/ or turkey/ or exp united kingdom/ or exp united states/

61 european union/

62 developed countries/

63 or/59-62

64 58 not 63

65 57 not 64

66 limit 65 to english language

67 limit 66 to yr="2009 -Current"

68 limit 67 to (letter or historical article or comment or editorial or news or case reports)

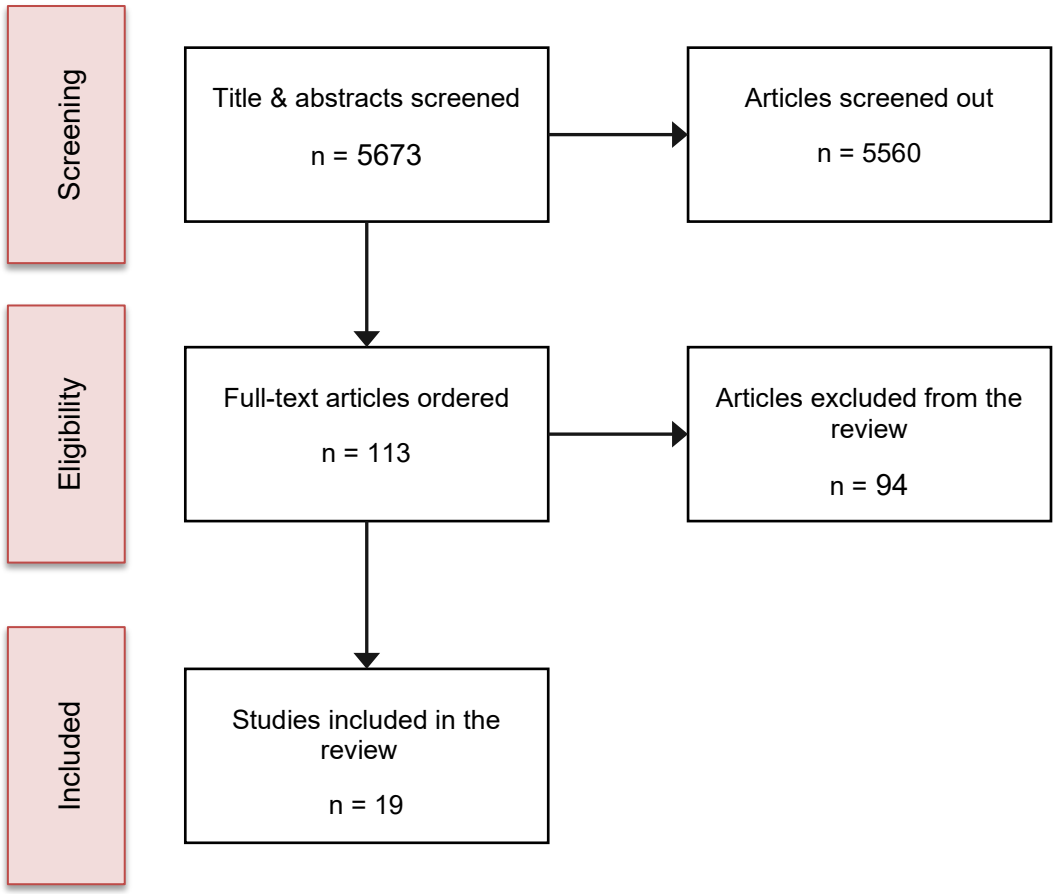
69 67 not 68

70 Animals/ not (Humans/ and Animals/)

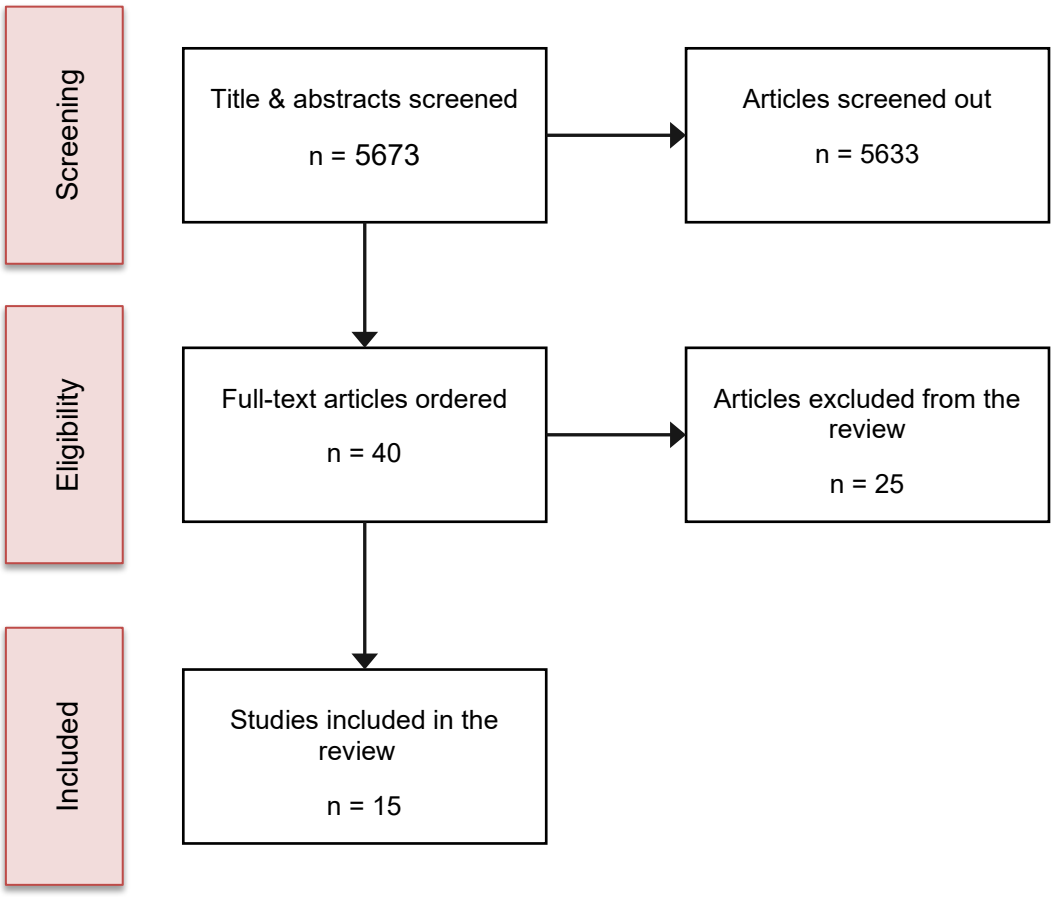
71 69 not 70

Appendix C Evidence study selection

Quantitative evidence



Qualitative evidence



Appendix D – Evidence tables

D.1 Effectiveness evidence

Bauermeister, 2015

Bibliographic Reference	Bauermeister, Jose A; Pingel, Emily S; Jadwin-Cakmak, Laura; Harper, Gary W; Horvath, Keith; Weiss, Gretchen; Dittus, Patricia; Acceptability and preliminary efficacy of a tailored online HIV/STI testing intervention for young men who have sex with men: the Get Connected! program.; AIDS and behavior; 2015; vol. 19 (no. 10); 1860-74

Study details

Secondary publication of another included study- see primary study for details	
Trial registration number and/or trial name	None
Study type	Randomised controlled trial (RCT)
Study location	Michigan, USA
Study setting	Online
Study dates	Not provided
Sources of funding	the National Association of County and City Health Officials (NACHHO) and the MAC AIDS Fund
Inclusion criteria	Age 15-24 Previous sex with a male partner in last 6 months Male Cisgender Location reside in the five counties included in the larger Southeast Michigan region
Intervention(s)	The tailored intervention condition was developed by customizing content based on YMSMs baseline assessment. Specifically, we used several key

	characteristics to tailor personalized content within the intervention using YMSMs psychosocial data (i.e., age, race/ethnicity, sexual identity, relationship status, HIV/STI testing history and testing motivations, recent sexual behaviour, sources of support, structural barriers, and self-reported values). Based on these data, our tailoring algorithm matched content within the tailored condition and promoted personalization of key characteristics by including images that mirrored participants' sociodemographic characteristics (e.g., a Black YMSM saw images of other Black men, whereas Latino YMSM saw images of other Latino young men; YMSM in a relationship saw images of men with their partners). Similarly, intervention content (e.g., text content) was customized based on prior testing experiences and motivations, barriers and resources to testing, and important values. Based on their answers, YMSM received messaging that reflected their lived experiences (e.g., a young man who had never tested for HIV or STIs received messages to promote testing, whereas YMSM who had tested for HIV and/or STIs in the past received messages that reinforced their testing behaviour and reminded them of the importance of repeat testing).
Comparator	In the non-tailored condition participants only received access to the online provider directory page (they did not receive any personalized tailored content). Participants were then allowed to sort providers based on their geographic area, hours of operation, ability to test without an appointment, access to public transportation, and insurance or personal identification requirements. Sorted testing sites were rank ordered using an algorithm that accounted for our evaluation of each site. Sites were scored based on their LGBTQ inclusivity and confidentiality during the testing process, providers' LGBTQ friendliness, discussion of sex and relationship goals, ability to discuss motivations for testing, sex positive tone, avoidance of making assumptions about the client, assessment of potential intimate partner violence, and pressure to adopt risk reduction strategies. Finally, to facilitate YMSMs utilization of HIV/STI services, participants were provided with a list of questions they could ask the provider during a testing visit.
Outcome measures	Intervention Acceptability STI Testing Behaviour Changes in sexual behaviour Self efficacy towards STI testing
Number of participants	104 in total. Unclear how many in each group.
Duration of follow-up	30 days
Loss to follow-up	26 (80% retention)
Methods of analysis	The sample size for this pilot trial provided 80 % power to detect an odds ratio of 2.5 or greater between the conditions using a one-sided test of $p < .05$. Consistent with the pilot nature of our RCT, however, we sought to estimate the critical parameters required to establish whether one or both of the intervention conditions had sufficient feasibility, acceptability and preliminary efficacy [31] in preparation for a larger efficacy trial. To test the

	intervention's acceptability, we computed the mean acceptability scores across both treatment conditions and examined whether there were any statistical differences between the tailored condition and the test-locator only condition. Next, we examined our preliminary efficacy outcomes (i.e., scheduled a HIV/STI appointment, received HIV/STI testing) across treatment conditions using Chi squares. We also examined the secondary efficacy outcomes (i.e., sexual behaviour, self-efficacy, perceived barriers). In these analyses, we examined the overall change from baseline to follow-up in the sample using paired samples t-tests as a way of examining participants' change over time. We then computed mean difference scores (i.e., net gains from baseline to follow-up) and used t-tests to estimate whether the changes over time were better for the tailoring condition versus the test-locator only condition; these analyses are noted as “Differential gain t test” in our tables.

Study arms

Tailored website (N = 86)
Shown a tailored personalised website

Non-tailored website (N = 44)
Shown an online provider directory page

Characteristics

Study-level characteristics

Characteristic	Study (N =)
Age (Mean (SD)) Mean (SD)	21 (2.23)
Race/ethnicity (%) Nominal	92.3
White Nominal	65.6
Black Nominal	19.5
Latino Nominal	9.4
Middle Eastern Nominal	7.8
Asian/Pacific islander Nominal	6.3

Characteristic	Study (N =)
Completed high school (%) Nominal	92.3
Student (%) Nominal	70
Living alone (%) Nominal	18.5

Critical appraisal - GUT Cochrane Risk of Bias tool (RoB 2.0) Normal RCT

Section	Question	Answer
Domain 1: Bias arising from the randomisation process	1. 1. Was the allocation sequence random?	Yes
Domain 1: Bias arising from the randomisation process	1. 2. Was the allocation sequence concealed until participants were enrolled and assigned to interventions?	No information
Domain 1: Bias arising from the randomisation process	1.3 Did baseline differences between intervention groups suggest a problem with the randomisation process?	Probably no *(They state no differences but do not provide separate baseline statistics)*
Domain 1: Bias arising from the randomisation process	Risk of bias judgement for the randomisation process	Low
Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention)	2.1. Were participants aware of their assigned intervention during the trial?	Probably yes
Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention)	2.2. Were carers and people delivering the interventions aware of participants' assigned intervention during the trial?	No information
Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention)	2.3. If Y/PY/NI to 2.1 or 2.2: Were there deviations from the intended intervention that arose because of the experimental context?	No/Probably no

Section	Question	Answer
Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention)	2.4. If Y/PY to 2.3: Were these deviations from intended intervention balanced between groups?	No information
Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention)	2.5 If N/PN/NI to 2.4: Were these deviations likely to have affected the outcome?	No information
Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention)	2.6 Was an appropriate analysis used to estimate the effect of assignment to intervention?	No information
Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention)	2.7 If N/PN/NI to 2.6: Was there potential for a substantial impact (on the result) of the failure to analyse participants in the group to which they were randomized?	Probably no
Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention)	Risk of bias for deviations from the intended interventions (effect of assignment to intervention)	Low
Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention)	2.1. Were participants aware of their assigned intervention during the trial?	Probably yes
Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention)	2.2. Were carers and people delivering the interventions aware of participants' assigned intervention during the trial?	No information
Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention)	2.3. If Y/PY/NI to 2.1 or 2.2: Were important co-interventions balanced across intervention groups?	Not applicable
Domain 2b: Risk of bias due to deviations from the intended interventions	2.4. Could failures in implementing the intervention have affected the outcome?	No

Section	Question	Answer
(effect of adhering to intervention)		
Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention)	2.5. Did study participants adhere to the assigned intervention regimen?	No information
Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention)	2.6. If N/PN/NI to 2.3 or 2.5 or Y/PY/NI to 2.4: Was an appropriate analysis used to estimate the effect of adhering to the intervention?	No information
Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention)	Risk of bias judgement for deviations from the intended interventions (effect of adhering to intervention)	Low
Domain 3. Bias due to missing outcome data	3.1 Were data for this outcome available for all, or nearly all, participants randomised?	Probably no
Domain 3. Bias due to missing outcome data	3.2 If N/PN/NI to 3.1: Is there evidence that result was not biased by missing outcome data?	No
Domain 3. Bias due to missing outcome data	3.3 If N/PN to 3.2: Could missingness in the outcome depend on its true value?	Probably yes
Domain 3. Bias due to missing outcome data	3.4 If Y/PY/NI to 3.3: Do the proportions of missing outcome data differ between intervention groups?	No information *(Not addressed)*
Domain 3. Bias due to missing outcome data	3.5 If Y/PY/NI to 3.3: Is it likely that missingness in the outcome depended on its true value?	Probably yes
Domain 3. Bias due to missing outcome data	Risk-of-bias judgement for missing outcome data	Some concerns
Domain 4. Bias in measurement of the outcome	4.1 Was the method of measuring the outcome inappropriate?	Yes
Domain 4. Bias in measurement of the outcome	4.2 Could measurement or ascertainment of the outcome have differed between intervention groups ?	No

Section	Question	Answer
Domain 4. Bias in measurement of the outcome	4.3 If N/PN/NI to 4.1 and 4.2: Were outcome assessors aware of the intervention received by study participants ?	Not applicable
Domain 4. Bias in measurement of the outcome	4.4 If Y/PY/NI to 4.3: Could assessment of the outcome have been influenced by knowledge of intervention received?	No information
Domain 4. Bias in measurement of the outcome	4.5 If Y/PY/NI to 4.4: Is it likely that assessment of the outcome was influenced by knowledge of intervention received?	No information
Domain 4. Bias in measurement of the outcome	Risk-of-bias judgement for measurement of the outcome	Low
Domain 5. Bias in selection of the reported result	5.1 Was the trial analysed in accordance with a pre-specified plan that was finalised before unblinded outcome data were available for analysis ?	No
Domain 5. Bias in selection of the reported result	5.2 Is the numerical result being assessed likely to have been selected, on the basis of the results, from multiple outcome measurements (e.g. scales, definitions, time points) within the outcome domain?	No/Probably no
Domain 5. Bias in selection of the reported result	5.3 Is the numerical result being assessed likely to have been selected, on the basis of the results, from multiple analyses of the data?	No/Probably no
Domain 5. Bias in selection of the reported result	Risk-of-bias judgement for selection of the reported result	Low
Overall bias and Directness	Risk of bias judgement	Some concerns
Overall bias and Directness	Overall Directness	Indirectly applicable

Booth, 2014

Bibliographic Reference	Booth, Amy R; Norman, Paul; Goyder, Elizabeth; Harris, Peter R; Campbell, Michael J; Pilot study of a brief intervention based on the theory of planned behaviour and self-identity to increase chlamydia testing among young people living in deprived areas.; British journal of health psychology; 2014; vol. 19 (no. 3); 636-51

Study details

Trial registration number and/or trial name	None
Study type	Cluster randomised controlled trial
Study location	Sheffield, UK (inferred)
Study setting	Further education colleges
Study dates	Not provided
Sources of funding	Not provided
Inclusion criteria	Age 16-24
Intervention(s)	In the intervention condition, students were shown a short video developed specifically for the intervention (approximately 1 min) featuring a number of different young people talking about getting tested for chlamydia. This was designed to target components of the TPB and self-identity in relation to chlamydia testing. The specific behavioural, normative, and control beliefs that were targeted in the video were identified using data from previous research on beliefs about chlamydia testing in young people living in deprived areas of a northern city in England. Accordingly, the video reinforced the positive behavioural beliefs that (1) ‘Regular testing will let me know whether or not I have chlamydia and help stop the spread of infection to others’, and (2) ‘Regular testing is a “win–win” situation; if I find out that I do not have chlamydia it gives me reassurance that I’m healthy, and if I find out that I do have chlamydia I can get quick and easy treatment’. The video also reinforced the positive normative beliefs that ‘My friends/parents/partner(s) would approve of me getting tested regularly’ and challenged the negative control beliefs that (1) ‘Getting tested regularly is too much hassle (for example, taking up a lot of my time, travelling to get tested, having more important things to do)’, and (2) ‘I would be worried about people finding out about me getting tested, or that I have chlamydia’. Self-identity was targeted by reinforcing the belief that chlamydia testing is just a normal part of being a young person with a healthy sex life and promoting chlamydia testing as a responsible behaviour performed by all sexually active young adults regardless of age, gender, ethnicity, background, or sexuality. After the video, students were talked through a

	poster about chlamydia and testing, designed to further target the TPB components, plus five case study posters featuring different people, designed to target self-identity in the same way as the video.
Comparator	The control condition consisted of the OWs' usual chlamydia testing promotion session. Students were asked whether they knew what chlamydia was and the OW confirmed that chlamydia is an STI. They then discussed how chlamydia is transmitted, the asymptomatic nature of the infection, and the importance of testing, other common STIs that, unlike chlamydia, have symptoms, the test for chlamydia, results and treatment, the short-term long-term consequences of untreated chlamydia (i.e., infertility), and the importance of using a condom to protect against STIs. This session lasted approximately 15 min
Outcome measures	STI Testing Behaviour Number of tests taken STI testing intention Attitude towards STI testing
Number of participants	253 participants in total (intervention n = 145; control n = 108)
Duration of follow-up	No follow up
Loss to follow-up	n/a
Methods of analysis	Generalized estimating equations (GEEs) are able to account for within cluster or intracluster correlation and allow an extra level of variability than the generalized linear modelling approach, thus making them more accurate (for an overview of GEEs; Ghisletta & Spini, 2004). GEEs were therefore used to assess the effect of condition on test offer acceptance, controlling for cluster effects and including sexual activity as a covariate. Generalized estimating equations were also used to assess the effect of condition on the secondary outcome variables (Table 3), controlling for cluster effects within tutor groups and including sexual activity as a covariate.
Additional comments	

Study arms

TPB intervention (N = 145)

The intervention was based on the theory of planned behaviour, augmented with self-identity, and targeted the significant predictors of chlamydia testing intentions identified in the previous research

Usual testing promotion (N = 108)

Control condition

Characteristics

Arm-level characteristics

Characteristic	TPB intervention (N = 145)	Usual testing promotion (N = 108)
Male Nominal	21.4	27.8
Female Nominal	78.6	71.3
Age (Mean) Mean (SD)	16.63 (*empty data*)	17.02 (*empty data*)
White Nominal	79.3	75.9
Non-white Nominal	19.3	22.2
Missing data Nominal	1.4	1.9
Sixth form college Nominal	15.2	20.04
Vocational college Nominal	84.8	79.6
higher Nominal	53.1	44.4
lower Nominal	46.9	55.5
>40 (most deprived) Nominal	46.2	45.4
20-39 Nominal	31.7	30.6
<19 (least deprived) Nominal	18.6	22.2
Yes Nominal	71	50

Characteristic	TPB intervention (N = 145)	Usual testing promotion (N = 108)
No Nominal	26.9	45.4
Yes Nominal	48.3	35.2
No Nominal	49.7	60.2
Yes Nominal	49.7	38
No Nominal	48.3	55.6

Critical appraisal - GUT Cochrane Risk of Bias tool (RoB 2.0) Cluster trials

Section	Question	Answer
1a. Bias arising from the randomisation process	1a. 1. Was the allocation sequence random?	Yes
1a. Bias arising from the randomisation process	1a. 2. Is it likely that the allocation sequence was subverted?	No
1a. Bias arising from the randomisation process	1a. 3. Were there baseline imbalances that suggest a problem with the randomisation process?	No
1a. Bias arising from the randomisation process	Risk of bias judgement for the randomisation process	Low
1b. Bias arising from the timing of identification and recruitment of individual participants in relation to timing of randomisation	1b. 1. Were all the individual participants identified before randomisation of clusters (and if the trial specifically recruited patients were they all recruited before randomisation of clusters)?	No information
1b. Bias arising from the timing of identification and recruitment of individual participants in relation to timing of randomisation	1b. 2. If N/PN/NI to 1b.1: Is it likely that selection of individual participants was affected by knowledge of the intervention?	No
1b. Bias arising from the timing of identification and recruitment	1b. 3. Were there baseline imbalances that suggest differential identification or	No

Section	Question	Answer
of individual participants in relation to timing of randomisation	recruitment of individual participants between arms?	
1b. Bias arising from the timing of identification and recruitment of individual participants in relation to timing of randomisation	Risk of bias judgement for the timing of identification and recruitment of individual participants in relation to timing of randomisation	Low
2. Bias due to deviations from intended interventions	2.1a Were participants aware that they were in a trial?	Yes
2. Bias due to deviations from intended interventions	2.1b If Y/PY/NI to 2.1a: Were participants aware of their assigned intervention during the trial?	Yes
2. Bias due to deviations from intended interventions	2.2. Were carers and trial personnel aware of participants' assigned intervention during the trial?	Yes
2. Bias due to deviations from intended interventions	2.3. If Y/PY/NI to 2.1 or 2.2: Were there deviations from the intended intervention beyond what would be expected in usual practice?	Probably no
2. Bias due to deviations from intended interventions	2.4. If Y/PY to 2.3: Were these deviations from intended intervention unbalanced between groups and likely to have affected the outcome?	Probably no
2. Bias due to deviations from intended interventions	2.5a Were any clusters analysed in a group different from the one to which they were assigned?	No
2. Bias due to deviations from intended interventions	2.5b Were any participants analysed in a group different from the one to which their original cluster was randomised?	No
2. Bias due to deviations from intended interventions	2.6 If Y/PY/NI to 2.5: Was there potential for a substantial impact (on the estimated effect of intervention) of analysing participants in the wrong group?	No
2. Bias due to deviations from intended interventions	Risk of bias judgement for deviations from intended interventions	Low
3. Bias due to missing outcome data	3.1a Were outcome data available for all, or nearly all, clusters randomised?	Yes
3. Bias due to missing outcome data	3.1b Were outcome data available for all, or nearly all, participants within clusters?	Yes

Section	Question	Answer
3. Bias due to missing outcome data	3.2 If N/PN/NI to 3.1a or 3.1b: Are the proportions of missing outcome data and reasons for missing outcome data similar across intervention groups?	No information
3. Bias due to missing outcome data	3.3 If N/PN/NI to 3.1a or 3.1b: Is there evidence that results were robust to the presence of missing outcome data?	No information
3. Bias due to missing outcome data	Risk of bias judgement for missing outcome data	Low
4. Bias in measurement of the outcome	4.1a Were outcome assessors aware that a trial was taking place?	Yes
4. Bias in measurement of the outcome	4.1b If Y/PY/NI to 4.1: Were outcome assessors aware of the intervention received by study participants?	Yes
4. Bias in measurement of the outcome	4.2 If Y/PY/NI to 4.1: Was the assessment of the outcome likely to be influenced by knowledge of intervention received?	No
4. Bias in measurement of the outcome	Risk of bias judgement for measurement of the outcome	Low
5. Bias in selection of the reported result	5.1 Are the reported outcome data likely to have been selected, on the basis of the results, from multiple outcome measurements (e.g. scales, definitions, time points) within the outcome domain?	No/Probably no
5. Bias in selection of the reported result	5.2 Are the reported outcome data likely to have been selected, on the basis of the results, from multiple analyses of the data?	No/Probably no
5. Bias in selection of the reported result	Risk of bias for selection of the reported result	Low
Overall bias and Directness	Risk of bias judgement	Low
Overall bias and Directness	Overall Directness	Directly applicable

Dolan, 2014

Bibliographic Reference	Dolan, Paul; Rudisill, Caroline; The effect of financial incentives on chlamydia testing rates: evidence from a randomized experiment.; Social science & medicine (1982); 2014; vol. 105; 140-8

Study details

Trial registration number and/or trial name	None
Study type	Randomised controlled trial (RCT)
Study location	England, UK
Study setting	Online
Study dates	April 2011 and May 2012
Sources of funding	This research was funded by the Centre for the Study of Incentives in Health (CSI Health), from a strategic award from the Wellcome Trust Biomedical Ethics Programme
Inclusion criteria	Age 16-24
Intervention(s)	Five types of incentives to return specimens: 1. reward vouchers of differing values, 2.charity donation, 3. participation in a lottery, 4. choices between a lottery and a voucher, and 5. including vouchers of differing values in the test kit prior to specimen return. We chose a Tesco voucher for each incentive group except the charity group because of the reward's universality. Tesco has stores across England and an online presence as a major English retailer. It is recognizable regardless of gender, socioeconomic status and interests. Tesco sells a wide range of products from food to clothing to electrical equipment. We chose 'Children in Need' as the charity because it is well-known across England and has a generally positive appeal. In both Rounds, respondents had 18 days to return their sample, after which they received the normal Freetest.me protocol of a text reminder.
Comparator	No incentive provided, usual care of Preventx Limited's online and text screening service, Freetest.me
Outcome measures	Number of STI tests Specimen return rate
Number of participants	2988 young people (1489 in Round 1 and 1499 in Round 2
Duration of follow-up	30 days

Loss to follow-up	n/a
Methods of analysis	We estimate the effect of any of the non-cash financial incentive structures on chlamydia test specimen sample return likelihood using multivariate logistic regressions clustering participants based on the first three letters of their postcodes. We use interaction terms to examine the extent to which participant socioeconomic status might influence the effectiveness of any of the incentives tested. We ensured specification robustness using variance inflation factors, the regression error misspecification test (Jones, 2007) and omitted variable bias checks. We performed all analyses in STATA 12.1.

Study arms

No incentive (N = 250)
Usual care

£5 voucher (N = 246)
Tesco voucher upon return of sample

Lottery for £50 voucher (N = 247)
Entered into a lottery with a 90% chance of £0 payoff and a 10% chance of a £50 Tesco voucher

Choice of reward (N = 247)
Given choice of receiving a £5 Tesco voucher or being entered into the lottery with a 90% chance of £0 payoff and a 10% chance of a £50 Tesco voucher

Endowment (N = 250)
Receive £5 Tesco voucher with kit

Charity (N = 249)
Receive £5 donation on their behalf to Children in Need

Characteristics

Arm-level characteristics

Characteristic	No incentive (N = 250)	£5 voucher (N = 246)	Lottery for £50 voucher (N = 247)	Choice of reward (N = 247)	Endowment (N = 250)	Charity (N = 249)
% Male (%) Nominal	0.36	0.33	0.3	0.23	0.4	0.33
IMD score Nominal	20.8	19.6	21.7	19.1	20	21

Characteristic	No incentive (N = 250)	£5 voucher (N = 246)	Lottery for £50 voucher (N = 247)	Choice of reward (N = 247)	Endowment (N = 250)	Charity (N = 249)
Age (Mean) Nominal	20.5	20.8	20.7	20.4	20.5	20.8
White Nominal	0.85	0.88	0.88	0.89	0.87	0.92
Black Nominal	0.01	0.02	0.01	0.01	0.01	0.02
Asian Nominal	0.03	0.01	0.01	0.01	0.03	0.001
Mixed Nominal	0.04	0.02	0.03	0.02	0.04	0.02

Critical appraisal - GUT Cochrane Risk of Bias tool (RoB 2.0) Normal RCT

Section	Question	Answer
Domain 1: Bias arising from the randomisation process	1. 1. Was the allocation sequence random?	Probably no *(Sequentially allocated on website)*
Domain 1: Bias arising from the randomisation process	1. 2. Was the allocation sequence concealed until participants were enrolled and assigned to interventions?	Probably no
Domain 1: Bias arising from the randomisation process	1.3 Did baseline differences between intervention groups suggest a problem with the randomisation process?	No
Domain 1: Bias arising from the randomisation process	Risk of bias judgement for the randomisation process	High
Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention)	2.1. Were participants aware of their assigned intervention during the trial?	Probably yes *(Not clear if they were aware if their incentive differed from standard practice)*
Domain 2a: Risk of bias due to deviations from the intended interventions	2.2. Were carers and people delivering the interventions aware of participants' assigned intervention during the trial?	No information

Section	Question	Answer
(effect of assignment to intervention)		
Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention)	2.3. If Y/PY/NI to 2.1 or 2.2: Were there deviations from the intended intervention that arose because of the experimental context?	No/Probably no
Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention)	2.4. If Y/PY to 2.3: Were these deviations from intended intervention balanced between groups?	No information
Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention)	2.5 If N/PN/NI to 2.4: Were these deviations likely to have affected the outcome?	No information
Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention)	2.6 Was an appropriate analysis used to estimate the effect of assignment to intervention?	No information
Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention)	2.7 If N/PN/NI to 2.6: Was there potential for a substantial impact (on the result) of the failure to analyse participants in the group to which they were randomized?	Probably no
Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention)	Risk of bias for deviations from the intended interventions (effect of assignment to intervention)	Low
Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention)	2.1. Were participants aware of their assigned intervention during the trial?	Probably yes
Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention)	2.2. Were carers and people delivering the interventions aware of participants' assigned intervention during the trial?	No information

Section	Question	Answer
Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention)	2.3. If Y/PY/NI to 2.1 or 2.2: Were important co-interventions balanced across intervention groups?	No information
Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention)	2.4. Could failures in implementing the intervention have affected the outcome?	No
Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention)	2.5. Did study participants adhere to the assigned intervention regimen?	No information *(No adherence required)*
Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention)	2.6. If N/PN/NI to 2.3 or 2.5 or Y/PY/NI to 2.4: Was an appropriate analysis used to estimate the effect of adhering to the intervention?	No information
Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention)	Risk of bias judgement for deviations from the intended interventions (effect of adhering to intervention)	Low
Domain 3. Bias due to missing outcome data	3.1 Were data for this outcome available for all, or nearly all, participants randomised?	Yes
Domain 3. Bias due to missing outcome data	3.2 If N/PN/NI to 3.1: Is there evidence that result was not biased by missing outcome data?	No information
Domain 3. Bias due to missing outcome data	3.3 If N/PN to 3.2: Could missingness in the outcome depend on its true value?	No information
Domain 3. Bias due to missing outcome data	3.4 If Y/PY/NI to 3.3: Do the proportions of missing outcome data differ between intervention groups?	No information
Domain 3. Bias due to missing outcome data	3.5 If Y/PY/NI to 3.3: Is it likely that missingness in the outcome depended on its true value?	No information
Domain 3. Bias due to missing outcome data	Risk-of-bias judgement for missing outcome data	Low

Section	Question	Answer
Domain 4. Bias in measurement of the outcome	4.1 Was the method of measuring the outcome inappropriate?	Yes
Domain 4. Bias in measurement of the outcome	4.2 Could measurement or ascertainment of the outcome have differed between intervention groups ?	No
Domain 4. Bias in measurement of the outcome	4.3 If N/PN/NI to 4.1 and 4.2: Were outcome assessors aware of the intervention received by study participants ?	Yes
Domain 4. Bias in measurement of the outcome	4.4 If Y/PY/NI to 4.3: Could assessment of the outcome have been influenced by knowledge of intervention received?	No
Domain 4. Bias in measurement of the outcome	4.5 If Y/PY/NI to 4.4: Is it likely that assessment of the outcome was influenced by knowledge of intervention received?	No information
Domain 4. Bias in measurement of the outcome	Risk-of-bias judgement for measurement of the outcome	Low
Domain 5. Bias in selection of the reported result	5.1 Was the trial analysed in accordance with a pre-specified plan that was finalised before unblinded outcome data were available for analysis ?	Probably yes
Domain 5. Bias in selection of the reported result	5.2 Is the numerical result being assessed likely to have been selected, on the basis of the results, from multiple outcome measurements (e.g. scales, definitions, time points) within the outcome domain?	No/Probably no
Domain 5. Bias in selection of the reported result	5.3 Is the numerical result being assessed likely to have been selected, on the basis of the results, from multiple analyses of the data?	No/Probably no
Domain 5. Bias in selection of the reported result	Risk-of-bias judgement for selection of the reported result	Low
Overall bias and Directness	Risk of bias judgement	Some concerns
Overall bias and Directness	Overall Directness	Directly applicable

Fuller, 2015

Bibliographic Reference	Fuller, Sebastian S; Mercer, Catherine H; Copas, Andrew J; Saunders, John; Sutcliffe, Lorna J; Cassell, Jackie A; Hart, Graham; Johnson, Anne M; Roberts, Tracy E; Jackson, Louise J; Muniina, Pamela; Estcourt, Claudia S; The SPORTSMART study: a pilot randomised controlled trial of sexually transmitted infection screening interventions targeting men in football club settings.; Sexually transmitted infections; 2015; vol. 91 (no. 2); 106-10

Study details

Secondary publication of another included study- see primary study for details	
Other publications associated with this study included in review	Cost effectiveness study: Jackson 2014
Trial registration number and/or trial name	SPORTSMART
Study type	Cluster randomised controlled trial
Study location	UK
Study setting	Amateur football clubs
Study dates	Recruitment between October and December 2012. Analysis of the main outcome was completed in May 2013.
Sources of funding	National Institute for Health Research (Targeting young men for better sexual health: THE BALLSEYE PROGRAM, reference number RP-PG-0707-10208)
Inclusion criteria	Age over 18 Male Venue has appropriate facilities Working toilets, changing rooms, home games played, and at least two teams of 11 players.
Intervention(s)	1. Captain and poster screening promotion: the team captain delivered a standardised brief screening promotion talk of <5 min duration (and then

	handed each player a test kit and answered any questions from participants. 2. Health adviser and poster screening promotion: a sexual health adviser from the study clinic delivered the standardised brief screening promotion talk of <5 min duration and then handed each player a test kit and answered any questions from participants.
Comparator	Poster-only screening promotion (comparator arm): posters were displayed that the men were free to read with kits readily available but there was no verbal information given.
Outcome measures	Number of STI tests STIs detected
Number of participants	6 clubs were randomised, 2 per study arm. 153 participants in total, 56 in the captain led group, 46 in the health professional led group, and 51 in the poster only group
Duration of follow-up	Up to 4 weeks
Loss to follow-up	n/a
Methods of analysis	We reported the primary outcome with a 95% CI based on a robust SE that acknowledges the clustering of participants by club. We do not report 95% CIs for the primary outcome by arm, nor conduct testing to compare arms, because there were only two clubs per arm and variability between clubs was substantial so that precision is low. The analysis of outcomes was not blinded to intervention arm.
Additional comments	No baseline characteristics reported

Study arms

captain-led (N = 56)
team captain-led and poster STI screening promotion

Health professional-led (N = 46)
sexual health adviser-led and poster STI screening promotion

Poster only (N = 51)
control

Critical appraisal - GUT Cochrane Risk of Bias tool (RoB 2.0) Cluster trials

Section	Question	Answer
1a. Bias arising from the randomisation process	1a. 1. Was the allocation sequence random?	Probably no *(Partially random - clubs were matched into pairs first)*
1a. Bias arising from the randomisation process	1a. 2. Is it likely that the allocation sequence was subverted?	No
1a. Bias arising from the randomisation process	1a. 3. Were there baseline imbalances that suggest a problem with the randomisation process?	No
1a. Bias arising from the randomisation process	Risk of bias judgement for the randomisation process	Some concerns
1b. Bias arising from the timing of identification and recruitment of individual participants in relation to timing of randomisation	1b. 1. Were all the individual participants identified before randomisation of clusters (and if the trial specifically recruited patients were they all recruited before randomisation of clusters)?	Probably yes
1b. Bias arising from the timing of identification and recruitment of individual participants in relation to timing of randomisation	1b. 2. If N/PN/NI to 1b.1: Is it likely that selection of individual participants was affected by knowledge of the intervention?	No
1b. Bias arising from the timing of identification and recruitment of individual participants in relation to timing of randomisation	1b. 3. Were there baseline imbalances that suggest differential identification or recruitment of individual participants between arms?	No
1b. Bias arising from the timing of identification and recruitment of individual participants in relation to timing of randomisation	Risk of bias judgement for the timing of identification and recruitment of individual participants in relation to timing of randomisation	Low

Section	Question	Answer
2. Bias due to deviations from intended interventions	2.1a Were participants aware that they were in a trial?	Yes
2. Bias due to deviations from intended interventions	2.1b If Y/PY/NI to 2.1a: Were participants aware of their assigned intervention during the trial?	Yes
2. Bias due to deviations from intended interventions	2.2. Were carers and trial personnel aware of participants' assigned intervention during the trial?	Yes
2. Bias due to deviations from intended interventions	2.3. If Y/PY/NI to 2.1 or 2.2: Were there deviations from the intended intervention beyond what would be expected in usual practice?	Yes *("the poster comparator arm was unintentionally 'enhanced' by some captains, who actively publicised the availability of STI screening at the club prior to the day by including details of the research in their weekly team information email and encouraging players to participate")*
2. Bias due to deviations from intended interventions	2.4. If Y/PY to 2.3: Were these deviations from intended intervention unbalanced between groups and likely to have affected the outcome?	Probably yes
2. Bias due to deviations from intended interventions	2.5a Were any clusters analysed in a group different from the one to which they were assigned?	No
2. Bias due to deviations from intended interventions	2.5b Were any participants analysed in a group different from the one to which their original cluster was randomised?	No
2. Bias due to deviations from intended interventions	2.6 If Y/PY/NI to 2.5: Was there potential for a substantial impact (on the estimated effect of intervention) of analysing participants in the wrong group?	No

Section	Question	Answer
2. Bias due to deviations from intended interventions	Risk of bias judgement for deviations from intended interventions	High
3. Bias due to missing outcome data	3.1a Were outcome data available for all, or nearly all, clusters randomised?	Yes
3. Bias due to missing outcome data	3.1b Were outcome data available for all, or nearly all, participants within clusters?	Yes
3. Bias due to missing outcome data	3.2 If N/PN/NI to 3.1a or 3.1b: Are the proportions of missing outcome data and reasons for missing outcome data similar across intervention groups?	No information
3. Bias due to missing outcome data	3.3 If N/PN/NI to 3.1a or 3.1b: Is there evidence that results were robust to the presence of missing outcome data?	No information
3. Bias due to missing outcome data	Risk of bias judgement for missing outcome data	Low
4. Bias in measurement of the outcome	4.1a Were outcome assessors aware that a trial was taking place?	No information
4. Bias in measurement of the outcome	4.1b If Y/PY/NI to 4.1: Were outcome assessors aware of the intervention received by study participants?	Not applicable
4. Bias in measurement of the outcome	4.2 If Y/PY/NI to 4.1: Was the assessment of the outcome likely to be influenced by knowledge of intervention received?	No
4. Bias in measurement of the outcome	Risk of bias judgement for measurement of the outcome	Low
5. Bias in selection of the reported result	5.1 Are the reported outcome data likely to have been selected, on the basis of the results, from multiple outcome measurements (e.g. scales,	Yes/Probably yes

Section	Question	Answer
	definitions, time points) within the outcome domain?	
5. Bias in selection of the reported result	5.2 Are the reported outcome data likely to have been selected, on the basis of the results, from multiple analyses of the data?	No/Probably no
5. Bias in selection of the reported result	Risk of bias for selection of the reported result	Some concerns
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

Kang, 2012

Bibliographic Reference	Kang, Melissa; Rochford, Arlie; Skinner, Rachel; Mindel, Adrian; Webb, Marianne; Peat, Jenny; Usherwood, Tim; Facilitating chlamydia testing among young people: a randomised controlled trial in cyberspace.; Sexually transmitted infections; 2012; vol. 88 (no. 8); 568-73

Study details

Secondary publication of another included study- see primary study for details	
Study type	Randomised controlled trial (RCT)
Study location	Australia
Study setting	Online
Study dates	March 2007 - January 2008
Sources of funding	e Australian Department of Health and Ageing as part of the Chlamydia Targeted Grants Programme
Inclusion criteria	Age 16-25 Previous sex with a male partner penetrative sexual intercourse Location Living in Australia Access to valid email account
Intervention(s)	Interventions The intervention group received personalised emails from a clinician (sexual health nurse or doctor). A ‘personalised email’ was sent from the clinician’s mailbox, included the clinician’s name and position, and contained a link to their staff profile on the University of Sydney’s website. The email thanked the young person for their participation and said that the clinician would like to ‘chat about chlamydia and getting tested’. The participant was invited to ask questions and prompted with questions about testing knowledge. Young people who responded were then engaged appropriately: advice depended on the questions asked. Non-responders were sent weekly emails for 3 months and then monthly emails for another 3 months. All email communication to non-responders in this group remained personalised, as described above
Comparator	Participants assigned to the control group received an email sent from the project mailbox (‘Clued Up’), was signed ‘The Clued Up Research Team’ and did not mention a clinician by name. These emails thanked the young person for participation and stated that they would be sent a reminder

	email about their participation in the study every month for 5 months and a final questionnaire in 6 months. These emails were intended to enhance retention and completion of the final questionnaire but were not personalised. There was no interaction and no clinical advice provided.
Outcome measures	STI Testing Behaviour Changes in sexual behaviour Attitude towards STI testing Number of STI tests Condom use STI knowledge
Number of participants	704 recruited. 211 recruited to the intervention, 194 completed it. 493 recruited to the control group, 465 completed it.
Duration of follow-up	6 Months
Loss to follow-up	98 from the intervention group and 249 from the control group.
Methods of analysis	Both intention-to-treat (ITT) and per-protocol (PP) analyses were performed. Statistical analysis was performed with SPSS V.16 with the individual as the unit of analysis. Proportions are presented with 95% CIs. To assess differences at baseline between the intervention (all), engaged and control groups, independent samples' t tests for the continuous variables and c2 tests for the categorical variables were performed. c2 Analysis was used to assess the statistical significance of differences in the primary outcome and in condom use between groups at follow-up. To adjust follow-up values for baseline values, analysis of covariance was used for knowledge questions and logistic regression for binary outcome measures.

Study arms

personalised emails (N = 211)

personalised emails inviting interaction about chlamydia testing

impersonal emails (N = 493)

the control group received regular impersonal emails

Characteristics

Arm-level characteristics

Characteristic	personalised emails (N = 211)	impersonal emails (N = 493)
Age (Mean)	20.5	20.3

Characteristic	personalised emails (N = 211)	impersonal emails (N = 493)
Nominal		
% Female (%) Nominal	78.6	78
Not born in Australia (%) Nominal	10.7	12.8
Aboriginal or Torres Strait Islander (%) Nominal	2	3
Major city Nominal	75	67.7
Inner regional Nominal	16.8	18.8
Outer regional Nominal	6.1	9.2
Remote Nominal	0	0.9
School Nominal	17.9	20.9
University Nominal	30.6	27.4
Full time work Nominal	31.6	31.8
Part time work Nominal	11.7	7.9
Looking for work Nominal	4	6.6
Age of sexual debut Nominal	16.2	16.3
Number of partners Nominal	3.1	3.1

Characteristic	personalised emails (N = 211)	impersonal emails (N = 493)
Previous chlamydia test Nominal	30.6	27.1
Previous chlamydia diagnosis Nominal	13.3	18.2

Critical appraisal - GUT Cochrane Risk of Bias tool (RoB 2.0) Normal RCT

Section	Question	Answer
Domain 1: Bias arising from the randomisation process	1. 1. Was the allocation sequence random?	Yes
Domain 1: Bias arising from the randomisation process	1. 2. Was the allocation sequence concealed until participants were enrolled and assigned to interventions?	Probably yes
Domain 1: Bias arising from the randomisation process	1.3 Did baseline differences between intervention groups suggest a problem with the randomisation process?	Probably no
Domain 1: Bias arising from the randomisation process	Risk of bias judgement for the randomisation process	Low
Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention)	2.1. Were participants aware of their assigned intervention during the trial?	Yes
Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention)	2.2. Were carers and people delivering the interventions aware of participants' assigned intervention during the trial?	No information
Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention)	2.3. If Y/PY/NI to 2.1 or 2.2: Were there deviations from the intended intervention that arose because of the experimental context?	No/Probably no
Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention)	2.4. If Y/PY to 2.3: Were these deviations from intended intervention balanced between groups?	No information

Section	Question	Answer
Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention)	2.5 If N/PN/NI to 2.4: Were these deviations likely to have affected the outcome?	No information
Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention)	2.6 Was an appropriate analysis used to estimate the effect of assignment to intervention?	Yes
Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention)	2.7 If N/PN/NI to 2.6: Was there potential for a substantial impact (on the result) of the failure to analyse participants in the group to which they were randomized?	No information
Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention)	Risk of bias for deviations from the intended interventions (effect of assignment to intervention)	Low
Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention)	2.1. Were participants aware of their assigned intervention during the trial?	Yes
Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention)	2.2. Were carers and people delivering the interventions aware of participants' assigned intervention during the trial?	No information
Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention)	2.3. If Y/PY/NI to 2.1 or 2.2: Were important co-interventions balanced across intervention groups?	Not applicable
Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention)	2.4. Could failures in implementing the intervention have affected the outcome?	Probably no
Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention)	2.5. Did study participants adhere to the assigned intervention regimen?	No information
Domain 2b: Risk of bias due to deviations from the	2.6. If N/PN/NI to 2.3 or 2.5 or Y/PY/NI to 2.4: Was an appropriate analysis used to	Yes

Section	Question	Answer
intended interventions (effect of adhering to intervention)	estimate the effect of adhering to the intervention?	
Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention)	Risk of bias judgement for deviations from the intended interventions (effect of adhering to intervention)	Low
Domain 3. Bias due to missing outcome data	3.1 Were data for this outcome available for all, or nearly all, participants randomised?	No
Domain 3. Bias due to missing outcome data	3.2 If N/PN/NI to 3.1: Is there evidence that result was not biased by missing outcome data?	Yes *(Sensitivity analysis)*
Domain 3. Bias due to missing outcome data	3.3 If N/PN to 3.2: Could missingness in the outcome depend on its true value?	Probably yes
Domain 3. Bias due to missing outcome data	3.4 If Y/PY/NI to 3.3: Do the proportions of missing outcome data differ between intervention groups?	Yes
Domain 3. Bias due to missing outcome data	3.5 If Y/PY/NI to 3.3: Is it likely that missingness in the outcome depended on its true value?	Probably yes
Domain 3. Bias due to missing outcome data	Risk-of-bias judgement for missing outcome data	High *(More than half missing from follow up)*
Domain 4. Bias in measurement of the outcome	4.1 Was the method of measuring the outcome inappropriate?	Yes
Domain 4. Bias in measurement of the outcome	4.2 Could measurement or ascertainment of the outcome have differed between intervention groups ?	No
Domain 4. Bias in measurement of the outcome	4.3 If N/PN/NI to 4.1 and 4.2: Were outcome assessors aware of the intervention received by study participants ?	Not applicable
Domain 4. Bias in measurement of the outcome	4.4 If Y/PY/NI to 4.3: Could assessment of the outcome have been influenced by knowledge of intervention received?	Probably no
Domain 4. Bias in measurement of the outcome	4.5 If Y/PY/NI to 4.4: Is it likely that assessment of the outcome was influenced by knowledge of intervention received?	No information

Section	Question	Answer
Domain 4. Bias in measurement of the outcome	Risk-of-bias judgement for measurement of the outcome	Low
Domain 5. Bias in selection of the reported result	5.1 Was the trial analysed in accordance with a pre-specified plan that was finalised before unblinded outcome data were available for analysis ?	Yes
Domain 5. Bias in selection of the reported result	5.2 Is the numerical result being assessed likely to have been selected, on the basis of the results, from multiple outcome measurements (e.g. scales, definitions, time points) within the outcome domain?	No/Probably no
Domain 5. Bias in selection of the reported result	5.3 Is the numerical result being assessed likely to have been selected, on the basis of the results, from multiple analyses of the data?	No/Probably no
Domain 5. Bias in selection of the reported result	Risk-of-bias judgement for selection of the reported result	Low
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Partially applicable

Klovstad, 2013

Bibliographic Reference	Klovstad, Hilde; Natas, Olav; Tverdal, Aage; Aavitsland, Preben; Systematic screening with information and home sampling for genital Chlamydia trachomatis infections in young men and women in Norway: a randomized controlled trial.; BMC infectious diseases; 2013; vol. 13; 30

Study details

Trial registration number and/or trial name	ClinicalTrials.gov IDNCT00283127
Study type	Randomised controlled trial (RCT)
Study location	Rogaland, Norway
Study setting	Population based
Study dates	February-May in 2006.
Sources of funding	The research was funded by the Norwegian Institute of Public Health.
Inclusion criteria	Age 18-25 Location Listed in national population register of Rogaland
Exclusion criteria	No postal address Participated in pilot study
Intervention(s)	Persons assigned to the intervention group (10 000) received a mail package at their home address consisting of the following: a letter with information on chlamydia and the importance of testing and treatment and an invitation to take a home test free of charge, a urine container, a durable water-tight plastic container, instructions on how to obtain a first void urine sample, a prepaid return envelope and a questionnaire (socio-demographic details, sexual behaviour, symptoms (discharge, endocervical bleeding, pelvic pain, urethral itching, dysuria) and history of sexually transmitted infections (STI)). Participants were asked to mail the urine samples by post in a leak-proof vessel enclosed in a durable water-tight plastic container directly to the laboratory at Stavanger University Hospital within three months after receiving the invitation. We used no reminders. The subgroups received the invitation one week apart and were then observed for the next three months. (Schedule: 30 January −30 April, 6 February- 6 May, 13 February −13 May, 20 February −20 May). A letter containing the test result and a contact phone number for support was provided to all participants from the diagnosing laboratory. If the test result was positive, the participant was requested to visit their family general practitioner, another doctor or a youth clinic for treatment and partner tracing at no cost.
Comparator	Persons assigned to the control group (31 519) received no intervention and were not informed about the trial and thus continued with the current

	strategy of testing in the health care system, including clinically indicated testing, partner tracing and opportunistic screening. Samples obtained in the health care system included either cervical or urethral swabs or first void urine samples. Patients with positive test results were, as per current routines, contacted by health professional for treatment and partner tracing. Test and treatment were free of charge. The control group was also followed for three months divided into four subgroups according to municipality and corresponding with the intervention group; starting and ending the observation period on the same dates as the corresponding intervention subgroup
Outcome measures	Number of STI tests STIs detected Treatment received
Number of participants	41519 participants: 10000 in the intervention, 31519 in the control group
Duration of follow-up	Within 3 months
Loss to follow-up	n/a
Methods of analysis	We also present risk ratios of being tested, diagnosed and treated stratified by age group and gender and the prevalence of infection by gender and age groups in each of the study groups. We calculated 95% confidence intervals for all risk ratios and risk differences. We applied intention-to-treat-analysis which is an analysis based on the initial group assignment (Figure 1). This is done to avoid that various reasons for not participating in the assigned group will interfere with the randomization and introduce bias. For our primary outcome measures the denominator in the intervention group is therefore 10 000 and in the control group 31 519. We used Poisson regression as the exponential of the regression coefficient for the intervention (yes-no) variable has the interpretation of a risk ratio. Interaction was assessed in the Poisson models with and without the interaction term, and based on the likelihood ratio test. We used Stata (StataCorp 2005. Stata Statistical Software: Release 9. College Station, TX: StataCorp LP) for analysis.

Study arms

Home test (N = 10000)

Invitation by mail with chlamydia information and a mail-back urine sampling kit

Usual care (N = 31519)

received no intervention and continued with usual care (control).

Characteristics

Arm-level characteristics

Characteristic	Home test (N = 10000)	Usual care (N = 31519)
18-21 Nominal	50.1	50.4
Male Nominal	50.7	50.7

Critical appraisal - GUT Cochrane Risk of Bias tool (RoB 2.0) Normal RCT

Section	Question	Answer
Domain 1: Bias arising from the randomisation process	1. 1. Was the allocation sequence random?	Yes
Domain 1: Bias arising from the randomisation process	1. 2. Was the allocation sequence concealed until participants were enrolled and assigned to interventions?	Yes
Domain 1: Bias arising from the randomisation process	1.3 Did baseline differences between intervention groups suggest a problem with the randomisation process?	Probably yes *("The randomization produced unbalance between the groups concerning municipality of residence (in one out of 26 municipalities). This could be a source of bias if the pre-trial prevalence of chlamydia differed between the municipalities. ")*
Domain 1: Bias arising from the randomisation process	Risk of bias judgement for the randomisation process	Some concerns
Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention)	2.1. Were participants aware of their assigned intervention during the trial?	Yes *("Individuals in the intervention group were aware of the study and their group assignment. The control group received no information about the study")*
Domain 2a: Risk of bias due to deviations from the intended	2.2. Were carers and people delivering the interventions aware of participants'	No information

Section	Question	Answer
interventions (effect of assignment to intervention)	assigned intervention during the trial?	
Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention)	2.3. If Y/PY/NI to 2.1 or 2.2: Were there deviations from the intended intervention that arose because of the experimental context?	Yes/Probably yes *("With such a large intervention affecting a fourth of the population in the targeted age group, there is bound to have been some "leakage" of information to the control group. Thus, also control subjects may have been prompted to get a chlamydia test. This effect would lead to a lower estimate of the effect of the intervention")*
Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention)	2.4. If Y/PY to 2.3: Were these deviations from intended intervention balanced between groups?	Probably no
Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention)	2.5 If N/PN/NI to 2.4: Were these deviations likely to have affected the outcome?	Yes
Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention)	2.6 Was an appropriate analysis used to estimate the effect of assignment to intervention?	Yes
Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention)	2.7 If N/PN/NI to 2.6: Was there potential for a substantial impact (on the result) of the failure to analyse participants in the group to which they were randomized?	Not applicable
Domain 2a: Risk of bias due to deviations from the intended interventions (effect	Risk of bias for deviations from the intended interventions (effect of assignment to intervention)	High

Section	Question	Answer
of assignment to intervention)		
Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention)	2.1. Were participants aware of their assigned intervention during the trial?	Yes
Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention)	2.2. Were carers and people delivering the interventions aware of participants' assigned intervention during the trial?	No information
Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention)	2.3. If Y/PY/NI to 2.1 or 2.2: Were important co-interventions balanced across intervention groups?	Not applicable
Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention)	2.4. Could failures in implementing the intervention have affected the outcome?	Probably no
Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention)	2.5. Did study participants adhere to the assigned intervention regimen?	No information
Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention)	2.6. If N/PN/NI to 2.3 or 2.5 or Y/PY/NI to 2.4: Was an appropriate analysis used to estimate the effect of adhering to the intervention?	Not applicable

Section	Question	Answer
Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention)	Risk of bias judgement for deviations from the intended interventions (effect of adhering to intervention)	Low
Domain 3. Bias due to missing outcome data	3.1 Were data for this outcome available for all, or nearly all, participants randomised?	Yes
Domain 3. Bias due to missing outcome data	3.2 If N/PN/NI to 3.1: Is there evidence that result was not biased by missing outcome data?	Not applicable
Domain 3. Bias due to missing outcome data	3.3 If N/PN to 3.2: Could missingness in the outcome depend on its true value?	Not applicable
Domain 3. Bias due to missing outcome data	3.4 If Y/PY/NI to 3.3: Do the proportions of missing outcome data differ between intervention groups?	Not applicable
Domain 3. Bias due to missing outcome data	3.5 If Y/PY/NI to 3.3: Is it likely that missingness in the outcome depended on its true value?	Not applicable
Domain 3. Bias due to missing outcome data	Risk-of-bias judgement for missing outcome data	Low
Domain 4. Bias in measurement of the outcome	4.1 Was the method of measuring the outcome inappropriate?	Yes
Domain 4. Bias in measurement of the outcome	4.2 Could measurement or ascertainment of the outcome have differed between intervention groups ?	Probably yes *("home tests from the intervention group were the only home tests received at this laboratory")*
Domain 4. Bias in measurement of the outcome	4.3 If N/PN/NI to 4.1 and 4.2: Were outcome assessors aware of the intervention received by study participants ?	Yes

Section	Question	Answer
Domain 4. Bias in measurement of the outcome	4.4 If Y/PY/NI to 4.3: Could assessment of the outcome have been influenced by knowledge of intervention received?	Probably no
Domain 4. Bias in measurement of the outcome	4.5 If Y/PY/NI to 4.4: Is it likely that assessment of the outcome was influenced by knowledge of intervention received?	Probably no
Domain 4. Bias in measurement of the outcome	Risk-of-bias judgement for measurement of the outcome	Some concerns
Domain 5. Bias in selection of the reported result	5.1 Was the trial analysed in accordance with a pre-specified plan that was finalised before unblinded outcome data were available for analysis ?	Yes
Domain 5. Bias in selection of the reported result	5.2 Is the numerical result being assessed likely to have been selected, on the basis of the results, from multiple outcome measurements (e.g. scales, definitions, time points) within the outcome domain?	No/Probably no
Domain 5. Bias in selection of the reported result	5.3 Is the numerical result being assessed likely to have been selected, on the basis of the results, from multiple analyses of the data?	No/Probably no
Domain 5. Bias in selection of the reported result	Risk-of-bias judgement for selection of the reported result	Low
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Indirectly applicable

Lim, 2012

Bibliographic Reference	Lim, MS; Hocking, JS; Aitken, CK; Fairley, CK; Jordan, L; Lewis, JA; Hellard, ME; Impact of text and email messaging on the sexual health of young people: a randomised controlled trial; Journal of epidemiology and community health; 2012; vol. 66 (no. 1); 69-74

Study details

Secondary publication of another included study- see primary study for details	
Trial registration number and/or trial name	Australian Clinical Trials Registry - ACTRN12605000760673
Study type	Randomised controlled trial (RCT)
Study location	Melbourne, Australia
Study setting	Online and via SMS
Study dates	28 Jan 2006 - 31 Jan 2007
Sources of funding	Australian Health Ministers Advisory Council Priority Driven Research Program, 2005
Inclusion criteria	Age 16-29 English language Location Victoria or Tasmania Access to a mobile phone Access to valid email account
Intervention(s)	At the Big Day Out music festival, participants completed a self-administered, paper-based baseline questionnaire, provided contact information and signed an informed consent form. The intervention group received regular email and SMS messages. SMS messages were sent every 3e4 weeks (a total of 14 over 12 months), while emails were sent less than monthly (a total of eight over 12 months). The SMS were short and catchy pieces of advice or information about STI or safe sex for example, ‘Chlamydia: hard to spell, easy to catch Use a condom’. SMS messages were tested in a focus group for understanding, relevance and amusement with a convenience sample of people aged 16-29. The emails

	were longer and contained two to five short paragraphs about a different safe sex or STI topic each month and links to other sexual health websites. Messages were sent at various times and on different days, with the SMS concentrated on Friday and Saturday evenings and the emails usually sent during weekday working hours.
Comparator	No emails or SMS messages
Outcome measures	Intervention Acceptability STI Testing Behaviour Condom use STI knowledge Speaking to a health practitioner about STIs
Number of participants	994 enrolled: 441 in the intervention, 456 in the control group
Duration of follow-up	3 months, 6 months, and 12 months
Loss to follow-up	3 Months: 184 lost from intervention, 177 lost from control group. 6 months: 176 lost from intervention, 174 lost from control group. 12 months: 179 lost from intervention, 200 lost from control group.
Methods of analysis	All randomised participants were included in the analysis. Our analysis was based on an intention to treat. Clustered weighted estimating equations were used to compare outcomes by intervention group at each time point; these were clustered by participant ID to allow for within-subject correlation with more than one measure on the same person. This method was chosen as it is able to account for participants dropping out at one time point and then returning to complete a later questionnaire.17 A weight for the missing data was calculated using methodology relating to post-stratification in sample surveys according to Carlin et al. 17 Among participants with a missing time point, the fixed factors that were predictive of missing response were identified. Baseline factors associated with not completing all questionnaires were not living with one's parents, lower STI knowledge, more frequent binge drinking and illicit drug use in the past month. The number of participants at baseline for each of these factors (set in 434 cells) was determined, and at each time point the response rate for each cell was calculated and the reciprocal used to determine the weight for each respondent. Interaction terms were included for time point and intervention group in the weighted estimating equation analysis. Gender was also included as an interaction term, but is only discussed when significant. All analyses included gender, age, education, drug use and alcohol frequency as potential confounding variables, and a p value of <0.05 was considered significant. Comparison of loss to follow-up between groups used a c2 test. Analysis was performed with Stata 9.

Study arms

sexual health promotion messages (N = 441)

The 12-month intervention included SMS (catchy sexually transmissible infections prevention slogans) and emails

Control group (N = 456)

No messages

Characteristics

Arm-level characteristics

Characteristic	sexual health promotion messages (N = 441)	Control group (N = 456)
16-19 Nominal	58	55
20-29 Nominal	42	45
Male Nominal	42	42
Female Nominal	58	58
Metropolitan Nominal	62	62
Rural Nominal	27	26
Australia Nominal	922	91
Overseas Nominal	8	9
Finished school Nominal	61	62
Previous sex Nominal	81	83
Always Nominal	24	23

Characteristic	sexual health promotion messages (N = 441)	Control group (N = 456)
Not always Nominal	23	25
No risky partners Nominal	53	51
Previous STI test Nominal	9	10

Critical appraisal - GUT Cochrane Risk of Bias tool (RoB 2.0) Normal RCT

Section	Question	Answer
Domain 1: Bias arising from the randomisation process	1. 1. Was the allocation sequence random?	Yes
Domain 1: Bias arising from the randomisation process	1. 2. Was the allocation sequence concealed until participants were enrolled and assigned to interventions?	Probably yes
Domain 1: Bias arising from the randomisation process	1.3 Did baseline differences between intervention groups suggest a problem with the randomisation process?	No
Domain 1: Bias arising from the randomisation process	Risk of bias judgement for the randomisation process	Low
Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention)	2.1. Were participants aware of their assigned intervention during the trial?	Yes
Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention)	2.2. Were carers and people delivering the interventions aware of participants' assigned intervention during the trial?	Yes
Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention)	2.3. If Y/PY/NI to 2.1 or 2.2: Were there deviations from the intended intervention that arose because of the experimental context?	No/Probably no
Domain 2a: Risk of bias due to deviations from the	2.4. If Y/PY to 2.3: Were these deviations from intended intervention balanced between groups?	Not applicable

Section	Question	Answer
intended interventions (effect of assignment to intervention)		
Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention)	2.5 If N/PN/NI to 2.4: Were these deviations likely to have affected the outcome?	Not applicable
Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention)	2.6 Was an appropriate analysis used to estimate the effect of assignment to intervention?	Yes
Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention)	2.7 If N/PN/NI to 2.6: Was there potential for a substantial impact (on the result) of the failure to analyse participants in the group to which they were randomized?	Not applicable
Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention)	Risk of bias for deviations from the intended interventions (effect of assignment to intervention)	Low
Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention)	2.1. Were participants aware of their assigned intervention during the trial?	Yes
Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention)	2.2. Were carers and people delivering the interventions aware of participants' assigned intervention during the trial?	Yes
Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention)	2.3. If Y/PY/NI to 2.1 or 2.2: Were important co-interventions balanced across intervention groups?	No information
Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention)	2.4. Could failures in implementing the intervention have affected the outcome?	No information
Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention)	2.5. Did study participants adhere to the assigned intervention regimen?	Probably no
Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention)	2.6. If N/PN/NI to 2.3 or 2.5 or Y/PY/NI to 2.4: Was an appropriate analysis used to estimate the effect of adhering to the intervention?	No

Section	Question	Answer
Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention)	Risk of bias judgement for deviations from the intended interventions (effect of adhering to intervention)	Some concerns
Domain 3. Bias due to missing outcome data	3.1 Were data for this outcome available for all, or nearly all, participants randomised?	No
Domain 3. Bias due to missing outcome data	3.2 If N/PN/NI to 3.1: Is there evidence that result was not biased by missing outcome data?	No
Domain 3. Bias due to missing outcome data	3.3 If N/PN to 3.2: Could missingness in the outcome depend on its true value?	Yes
Domain 3. Bias due to missing outcome data	3.4 If Y/PY/NI to 3.3: Do the proportions of missing outcome data differ between intervention groups?	Probably yes
Domain 3. Bias due to missing outcome data	3.5 If Y/PY/NI to 3.3: Is it likely that missingness in the outcome depended on its true value?	Yes
Domain 3. Bias due to missing outcome data	Risk-of-bias judgement for missing outcome data	High
Domain 4. Bias in measurement of the outcome	4.1 Was the method of measuring the outcome inappropriate?	Yes
Domain 4. Bias in measurement of the outcome	4.2 Could measurement or ascertainment of the outcome have differed between intervention groups ?	No
Domain 4. Bias in measurement of the outcome	4.3 If N/PN/NI to 4.1 and 4.2: Were outcome assessors aware of the intervention received by study participants ?	Yes
Domain 4. Bias in measurement of the outcome	4.4 If Y/PY/NI to 4.3: Could assessment of the outcome have been influenced by knowledge of intervention received?	Probably no
Domain 4. Bias in measurement of the outcome	4.5 If Y/PY/NI to 4.4: Is it likely that assessment of the outcome was influenced by knowledge of intervention received?	Probably no
Domain 4. Bias in measurement of the outcome	Risk-of-bias judgement for measurement of the outcome	Low
Domain 5. Bias in selection of the reported result	5.1 Was the trial analysed in accordance with a pre-specified plan that was finalised before	Yes

Section	Question	Answer
	unblinded outcome data were available for analysis ?	
Domain 5. Bias in selection of the reported result	5.2 Is the numerical result being assessed likely to have been selected, on the basis of the results, from multiple outcome measurements (e.g. scales, definitions, time points) within the outcome domain?	No/Probably no
Domain 5. Bias in selection of the reported result	5.3 Is the numerical result being assessed likely to have been selected, on the basis of the results, from multiple analyses of the data?	No/Probably no
Domain 5. Bias in selection of the reported result	Risk-of-bias judgement for selection of the reported result	Low
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

Lustria, 2016

Bibliographic Reference	Lustria, Mia Liza A; Cortese, Juliann; Gerend, Mary A; Schmitt, Karla; Kung, Ying Mai; McLaughlin, Casey; A model of tailoring effects: A randomized controlled trial examining the mechanisms of tailoring in a web-based STD screening intervention.; Health psychology : official journal of the Division of Health Psychology, American Psychological Association; 2016; vol. 35 (no. 11); 1214-1224

Study details

Trial registration number and/or trial name	None
Study type	Randomised controlled trial (RCT)
Study location	Florida, USA
Study setting	University
Study dates	Not provided
Sources of funding	Florida State University (FSU) Center for Creativity and Research, FSU College of Nursing, FSU University Health Services, Florida Department of Health, and Gen-Probe Incorporated.
Inclusion criteria	Age Over 18
Intervention(s)	Participants in the tailored condition received tailored persuasive content based on their responses to a theory-based STD risk assessment (i.e., the pretest). Specifically, content was tailored based on gender, relationship status (currently in a relationship or not), whether or not the individual had sex, and perceived risk of STDs. Responses were analysed using algorithms to create individualized risk reduction and sexual health messages from a message library. As such, participants in the tailored condition received unique combinations of messages, testimonials, feedback, and images based on their individual health information needs and matched with their pretest responses. Messages were highly prescriptive and personalized based on user characteristics. For example, testimonials were created to persuade participants about the merits of STD testing and were tailored based on gender, relationship status, and sexual activity. These messages included obvious identifiers (e.g., male or female names, ages, male or female images) to help heighten perceived relevance and increase attention to the content. Direct recommendations to get tested for STDs were carefully worded to consider the users' risk perceptions, relationship status, and sexual activity. Tailoring was generally guided by constructs from the health belief model (Rosenstock, 1974) and lessons from STD prevention research, tailoring and message design
Comparator	Participants in the control condition received general information about STDs taken from the CDC website. Content from the CDC site was

	embedded within the framework of the main study site in order to focus participants' attention on STD content similar to that presented to the treatment group but with no tailored elements or personalization.
Outcome measures	Intervention Acceptability STI Testing Behaviour STI testing intention Attitude towards STI testing
Number of participants	Total = 1065, 527 in the tailored condition, 538 in the non-tailored condition
Duration of follow-up	None
Methods of analysis	We used SPSS to compute descriptive statistics and t tests and chi-square analyses to compare participants in the nontailored versus tailored condition on baseline characteristics and all posttest measures. Since intervention effects were hypothesized to work via increases in perceived risk, we used repeated measures analysis of covariance (ANCOVA) to examine change in perceived risk of STDs from pretest to posttest by condition while controlling for gender, race, ethnicity, relationship status, and number of sexual partners. Three-way interactions between time (i.e., change in perceived risk from pretest to posttest), condition, and each predictor variable were also estimated; however none of the three-way interactions were significant so they were excluded from the final analysis. We created composite variables for all multiitem constructs (e.g., topic involvement, attention) by taking the average of the items. Composite variables are reported in Tables 2 and 3 and were used in the repeated measures ANCOVA. We estimated two models using SEM: a primary model with behavioural intentions to get tested for STDs as the main outcome variable and a secondary model with test-kit ordering behaviour as the main outcome variable. Behavioural intentions served as the outcome in the primary model because the main goal of the intervention was to promote general STD testing and the intentions measure best captures the full range of options participants have for testing. We estimated the secondary model to demonstrate effects of the intervention on behaviour, although at-home testing is only one possible option for getting tested. Each model included a measurement component and a structural component. The measurement component estimated latent factors for the following multiitem constructs: topic involvement (as indicated by 5 items described previously), personal relevance (2 items), attention (4 items), elaboration (6 items), perceived risk at posttest (3 items), and behavioural intentions (3 items). Latent factors were modelled by estimating paths from each latent factor to its associated indicator variables. All factor loadings from latent variables to their respective indicators were statistically significant (all ps < .001; not reported in Figure 2). Models also included several observed/measured exogenous variables: experimental condition (0 nontailored; 1 tailored), gender (0 female; 1 male), race (0 non-White race; 1 White race), ethnicity (0 not Hispanic/Latino/a; 1 Hispanic/Latino/a), relationship status (0 not in a relationship; 1 in a relationship), number of sexual partners in the past year (0 0 –2 partners; 1 3 or more partners), and test-kit ordering

	behaviour (0 no; 1 yes). Age was not associated with perceived risk, intentions, or ordering behaviour and thus was not included in the models. In the figures presenting the SEM analyses, measured/observed and latent variables are denoted with rectangles and circles, respectively. The structural component estimated the relationships among model constructs. In the primary model, the effect of condition (tailored vs. nontailored) on intentions to get tested for STDs was hypothesized to work through perceived relevance, attention, elaboration, and perceived risk. Specifically, we estimated a path from condition to perceived personal relevance, and from personal relevance to both attention and elaboration. Paths from attention and elaboration to perceived risk were also estimated, with a final path from perceived risk to intentions. Topic involvement was included as an exogenous variable in the model (with a path from topic involvement to perceived personal relevance), as topic involvement was expected to have an independent effect on participants' interest in reviewing the website. Paths from demographic characteristics and sexual history variables to both perceived risk and intentions were also estimated. All nonsignificant paths were dropped from the final model (see Figure 2). In the secondary model, we estimated an additional path from intentions to test-kit ordering behaviour (see Figure 3 in the online supplementary material). Analyses were conducted in Mplus using a maximum likelihood estimator for the primary model and a weighted least-squares estimator with mean and variance adjustment (WLSMV) for the secondary model because ordering behaviour is dichotomous (Muthén & Muthén, 1998 –2012). The disturbances of intermediary factors (i.e., attention and elaboration) were allowed to correlate, as well as the error variances for some indicator variables with a high degree of overlap. In addition to chi-square, model fit was assessed with the root-mean-square error of approximation (RMSEA), the comparative fit index (CFI), the standardized root-mean-square residual (SRMR), and the weighted root mean-square residual (WRMR). RMSEA values .06, CFI values .95, SRMR values .05, and WRMR values 1.0 indicate close fit

Study arms

Tailored website (N = 527)

tailored persuasive content based on their responses to a theory-based STD risk assessment

Nontailored website (N = 538)

General information about STDs taken from the CDC website

Characteristics

Arm-level characteristics

Characteristic	Tailored website (N = 527)	Nontailored website (N = 538)
Age (Mean) Mean (SD)	20.66 (1.43)	20.51 (1.54)
Male Nominal	55	52

Characteristic	Tailored website (N = 527)	Nontailored website (N = 538)
Female Nominal	45	48
Hispanic Nominal	19	18
White Nominal	83	84
African American Nominal	9	8
Asian/Pacific islander Nominal	4	2
Other Nominal	4	6
In a relationship Nominal	50	51
No relationship Nominal	50	49
0-2 Nominal	51	49
3 or more Nominal	47	53

Critical appraisal - GUT Cochrane Risk of Bias tool (RoB 2.0) Normal RCT

Section	Question	Answer
Domain 1: Bias arising from the randomisation process	1. 1. Was the allocation sequence random?	Yes
Domain 1: Bias arising from the randomisation process	1. 2. Was the allocation sequence concealed until participants were enrolled and assigned to interventions?	Probably yes

Section	Question	Answer
Domain 1: Bias arising from the randomisation process	1.3 Did baseline differences between intervention groups suggest a problem with the randomisation process?	No
Domain 1: Bias arising from the randomisation process	Risk of bias judgement for the randomisation process	Low
Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention)	2.1. Were participants aware of their assigned intervention during the trial?	No
Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention)	2.2. Were carers and people delivering the interventions aware of participants' assigned intervention during the trial?	No information
Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention)	2.3. If Y/PY/NI to 2.1 or 2.2: Were there deviations from the intended intervention that arose because of the experimental context?	No/Probably no
Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention)	2.4. If Y/PY to 2.3: Were these deviations from intended intervention balanced between groups?	No information
Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention)	2.5 If N/PN/NI to 2.4: Were these deviations likely to have affected the outcome?	No information
Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention)	2.6 Was an appropriate analysis used to estimate the effect of assignment to intervention?	No information
Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention)	2.7 If N/PN/NI to 2.6: Was there potential for a substantial impact (on the result) of the failure to analyse participants in the group to which they were randomized?	No information

Section	Question	Answer
Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention)	Risk of bias for deviations from the intended interventions (effect of assignment to intervention)	Low
Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention)	2.1. Were participants aware of their assigned intervention during the trial?	No
Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention)	2.2. Were carers and people delivering the interventions aware of participants' assigned intervention during the trial?	No information
Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention)	2.3. If Y/PY/NI to 2.1 or 2.2: Were important co-interventions balanced across intervention groups?	No information
Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention)	2.4. Could failures in implementing the intervention have affected the outcome?	Yes *("Participants were encouraged to explore the site for at least 10 min, but this was not required.")*
Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention)	2.5. Did study participants adhere to the assigned intervention regimen?	Probably yes
Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention)	2.6. If N/PN/NI to 2.3 or 2.5 or Y/PY/NI to 2.4: Was an appropriate analysis used to estimate the effect of adhering to the intervention?	Probably no
Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention)	Risk of bias judgement for deviations from the intended interventions (effect of adhering to intervention)	Some concerns
Domain 3. Bias due to missing outcome data	3.1 Were data for this outcome available for all, or nearly all, participants randomised?	Yes

Section	Question	Answer
Domain 3. Bias due to missing outcome data	3.2 If N/PN/NI to 3.1: Is there evidence that result was not biased by missing outcome data?	No information
Domain 3. Bias due to missing outcome data	3.3 If N/PN to 3.2: Could missingness in the outcome depend on its true value?	No information
Domain 3. Bias due to missing outcome data	3.4 If Y/PY/NI to 3.3: Do the proportions of missing outcome data differ between intervention groups?	No information
Domain 3. Bias due to missing outcome data	3.5 If Y/PY/NI to 3.3: Is it likely that missingness in the outcome depended on its true value?	No information
Domain 3. Bias due to missing outcome data	Risk-of-bias judgement for missing outcome data	Low
Domain 4. Bias in measurement of the outcome	4.1 Was the method of measuring the outcome inappropriate?	Yes
Domain 4. Bias in measurement of the outcome	4.2 Could measurement or ascertainment of the outcome have differed between intervention groups ?	No
Domain 4. Bias in measurement of the outcome	4.3 If N/PN/NI to 4.1 and 4.2: Were outcome assessors aware of the intervention received by study participants ?	Not applicable
Domain 4. Bias in measurement of the outcome	4.4 If Y/PY/NI to 4.3: Could assessment of the outcome have been influenced by knowledge of intervention received?	Not applicable
Domain 4. Bias in measurement of the outcome	4.5 If Y/PY/NI to 4.4: Is it likely that assessment of the outcome was influenced by knowledge of intervention received?	Not applicable
Domain 4. Bias in measurement of the outcome	Risk-of-bias judgement for measurement of the outcome	Low
Domain 5. Bias in selection of the reported result	5.1 Was the trial analysed in accordance with a pre-specified plan that was finalised before unblinded outcome data were available for analysis ?	Probably no

Section	Question	Answer
Domain 5. Bias in selection of the reported result	5.2 Is the numerical result being assessed likely to have been selected, on the basis of the results, from multiple outcome measurements (e.g. scales, definitions, time points) within the outcome domain?	No/Probably no
Domain 5. Bias in selection of the reported result	5.3 Is the numerical result being assessed likely to have been selected, on the basis of the results, from multiple analyses of the data?	No/Probably no
Domain 5. Bias in selection of the reported result	Risk-of-bias judgement for selection of the reported result	Low
Overall bias and Directness	Risk of bias judgement	Some concerns
Overall bias and Directness	Overall Directness	Directly applicable

Mevissen, 2011

Bibliographic Reference	Mevissen, Fraukje E F; Ruiter, Robert A C; Meertens, Ree M; Zimbile, Filippo; Schaalma, Herman P; Justify your love: testing an online STI-risk communication intervention designed to promote condom use and STI-testing.; Psychology & health; 2011; vol. 26 (no. 2); 205-21

Study details

Secondary publication of another included study- see primary study for details	
Trial registration number and/or trial name	None
Study type	Randomised controlled trial (RCT)
Study location	Rotterdam, the Netherlands.
Study setting	Universities and higher vocational training colleges
Study dates	November and December 2007
Sources of funding	ZonMw grant
Inclusion criteria	Age 18-25 Location the Netherlands (Dutch participants) Access to valid email account Recently started a heterosexual relationship Maximum 6 months Heterosexual
Intervention(s)	The setting of the intervention was a virtual STI public clinic. The website was a Flash-based program3 which guided the visitor linearly through the program by using an interactive question-and-answer format. A virtual person, the consultant, asked questions or provided information presented in text blocks or balloons. Participants answered questions by clicking on one of the answer possibilities presented on the screen. The next question or information appeared on the screen after answering a question or after clicking the ‘continue’ button in case of a text message. The program tailored the feedback and questions to the participant’s prior answers and in part to his or her gender. In essence, the visitor passed through the

	program as if in a conversation with the virtual consultant. All choices made by the participant during the visit and all information entered were automatically saved in a database. For an extended description of the content of the website as well as a detailed foundation of the methods used, see the Appendix. A brief description of the intervention will follow below. The intervention covered three content domains, or blocks in which the following determinants were successively embedded: STI risk perception related to the current relationship (block 1); attitude, normative beliefs, self-efficacy and skills towards maintenance of condom use within the current relationship (block 2) and STI-testing (block 3). Table 2 summarises the content of the different blocks (objectives, theoretical methods and practical strategies). The first part of the program was the personalised risk feedback and subsequent safe sex advice (block 1). The personalised risk feedback, based on the assessment of the participants' sexual history, could be one out of four possible messages: (1) not being at risk for STI; (2) having a low risk for STI; (3) having a considerable risk for STI or (4) risk is unknown because the visitor provided insufficient information. Visitors with no risk (and who were excluded in the final analyses) received a message that condom use or an STI check up was not necessary in their current situation. All others, regardless of risk level, received advice to (maintain) condom use or to do an STI-check up after 3 months of consistent condom use before stopping condom use. The intervention also stressed that the advice was only valid for their current relationship and if both partners remained faithful to one another. After delivering the personalised safe sex advice, the virtual consultant offered additional risk information, which participants could retrieve if desired, including: (1) scenario information (i.e. 'personal testimony' of a young man or woman about STIs and (un)safe sex in their relationship); (2) probability information regarding the prevalence and infectiousness of STIs and (3) information about the consequences and severity of STIs. Participants then proceeded with the condom promotion module (block 2) followed by the STI-test promotion module (block 3). These blocks focused on attitude, normative beliefs, self-efficacy and skills with regard to condom use maintenance and STI-testing. Techniques derived from motivational interviewing (i.e. create ambivalence, express empathy and be non-judgmental, use of positive reinforcement and supporting self-efficacy) were used to increase the intrinsic motivation and to create positive attitudes and self-efficacy beliefs towards condom use and STI-testing
Comparator	1. Non-tailored intervention The non-tailored intervention was a simplified version of the tailored intervention embedded in a similar virtual STI-public clinic. This version dealt with the same determinants, and contained similar sexual risk questions. It lacked the question– answer structure of the tailored intervention, no tailored feedback was provided and no personal consultant was included. Participants received general safe sex advice: Always use a condom for at least 3 months and then take an STI-test. After getting the information on the safe sex advice, recipients in the non-tailored condition received brief information concerning condom use barriers and STI-testing barriers. 2. The control group did not receive any intervention and received T1 measures directly after randomisation.
Outcome measures	STI Testing Behaviour

	STI testing intention Self efficacy towards STI testing Attitude towards STI testing Condom use Perception of STI risk Beliefs about STIs
Number of participants	Total recruited: 218. Tailored intervention: 67 recruited, 47 included in T1 analysis, 33 included in T2 analysis Non-tailored intervention: 81 recruited, 65 included in T1 analysis, 45 included in T2 analysis Control group: 70 recruited, 59 included in T1 analysis, 37 included in T2 analysis
Duration of follow-up	T1 = immediate T2 = 3 months
Loss to follow-up	From T1 to T2 Tailored condition: 23 Non-tailored condition: 26 Control group: 26
Methods of analysis	A between-subjects MANOVA test was performed in SPSS 13.0 to test the overall effect of condition (tailored vs. non-tailored vs. control) on the 11 cognitive measures (T1). Another MANOVA was performed for the effect of condition on the three linear behavioural measures (T2). Significant multivariate effects were examined using univariate analyses. If the univariate main effect of condition was significant, simple contrast analyses were performed to test which groups differed significantly. The three T2 binary measures were analysed using logistic regression with the factor 'condition' being recoded into two dummy variables: one representing the tailored group versus the control group, and the other one representing the non-tailored group versus the control group. Interaction terms were included in the original analyses to test whether demographic variables (i.e. gender, ethnic background and educational level) influenced the effect of condition on the outcome measures. No significant interaction effects were found, so analyses were repeated without the interaction terms.

Study arms

Tailored intervention (N = 67)

Personalised safe sex advice with a virtual consultant

Non-tailored intervention (N = 81)
Virtual STI-public clinic with no personalisation

Control (N = 70)
No intervention

Characteristics

Arm-level characteristics

Characteristic	Tailored intervention (N = 67)	Non-tailored intervention (N = 81)	Control (N = 70)
Age (Mean (SD)) Standardised Mean (SD)	20.7 (1.9)	20.9 (1.7)	20.7 (1.6)
Male Nominal	40.4	43.1	32.2
Female Nominal	59.6	56.9	67.8
Vocational training Nominal	40.4	41.5	37.3
University Nominal	57.4	58.5	61
Number of sexual partners (Mean (SD)) Mean (SD)	4.8 (4.2)	5.3 (6.2)	6.4 (5.5)
Previous STI test (%) Nominal	19.2	36.9	35.6
Previous positive test result (%) Nominal	33.3	16.7	19
Always Nominal	13.6	18	18.5
Irregular Nominal	45.5	45.9	48.1
Never Nominal	40.9	36.1	33.3

Critical appraisal - GUT Cochrane Risk of Bias tool (RoB 2.0) Normal RCT

Section	Question	Answer
Domain 1: Bias arising from the randomisation process	1. 1. Was the allocation sequence random?	Yes
Domain 1: Bias arising from the randomisation process	1. 2. Was the allocation sequence concealed until participants were enrolled and assigned to interventions?	Yes
Domain 1: Bias arising from the randomisation process	1.3 Did baseline differences between intervention groups suggest a problem with the randomisation process?	Probably no
Domain 1: Bias arising from the randomisation process	Risk of bias judgement for the randomisation process	Low
Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention)	2.1. Were participants aware of their assigned intervention during the trial?	Yes
Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention)	2.2. Were carers and people delivering the interventions aware of participants' assigned intervention during the trial?	No
Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention)	2.3. If Y/PY/NI to 2.1 or 2.2: Were there deviations from the intended intervention that arose because of the experimental context?	No/Probably no
Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention)	2.4. If Y/PY to 2.3: Were these deviations from intended intervention balanced between groups?	No information
Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention)	2.5 If N/PN/NI to 2.4: Were these deviations likely to have affected the outcome?	No information
Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention)	2.6 Was an appropriate analysis used to estimate the effect of assignment to intervention?	No
Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention)	2.7 If N/PN/NI to 2.6: Was there potential for a substantial impact (on the result) of the failure to analyse participants in the group to which they were randomized?	No

Section	Question	Answer
Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention)	Risk of bias for deviations from the intended interventions (effect of assignment to intervention)	Some concerns
Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention)	2.1. Were participants aware of their assigned intervention during the trial?	Yes
Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention)	2.2. Were carers and people delivering the interventions aware of participants' assigned intervention during the trial?	No
Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention)	2.3. If Y/PY/NI to 2.1 or 2.2: Were important co-interventions balanced across intervention groups?	Not applicable
Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention)	2.4. Could failures in implementing the intervention have affected the outcome?	Yes
Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention)	2.5. Did study participants adhere to the assigned intervention regimen?	No information
Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention)	2.6. If N/PN/NI to 2.3 or 2.5 or Y/PY/NI to 2.4: Was an appropriate analysis used to estimate the effect of adhering to the intervention?	No
Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention)	Risk of bias judgement for deviations from the intended interventions (effect of adhering to intervention)	Some concerns
Domain 3. Bias due to missing outcome data	3.1 Were data for this outcome available for all, or nearly all, participants randomised?	Probably yes
Domain 3. Bias due to missing outcome data	3.2 If N/PN/NI to 3.1: Is there evidence that result was not biased by missing outcome data?	Probably yes
Domain 3. Bias due to missing outcome data	3.3 If N/PN to 3.2: Could missingness in the outcome depend on its true value?	Probably no

Section	Question	Answer
Domain 3. Bias due to missing outcome data	3.4 If Y/PY/NI to 3.3: Do the proportions of missing outcome data differ between intervention groups?	No
Domain 3. Bias due to missing outcome data	3.5 If Y/PY/NI to 3.3: Is it likely that missingness in the outcome depended on its true value?	No
Domain 3. Bias due to missing outcome data	Risk-of-bias judgement for missing outcome data	Low
Domain 4. Bias in measurement of the outcome	4.1 Was the method of measuring the outcome inappropriate?	Yes
Domain 4. Bias in measurement of the outcome	4.2 Could measurement or ascertainment of the outcome have differed between intervention groups ?	No
Domain 4. Bias in measurement of the outcome	4.3 If N/PN/NI to 4.1 and 4.2: Were outcome assessors aware of the intervention received by study participants ?	Not applicable
Domain 4. Bias in measurement of the outcome	4.4 If Y/PY/NI to 4.3: Could assessment of the outcome have been influenced by knowledge of intervention received?	No
Domain 4. Bias in measurement of the outcome	4.5 If Y/PY/NI to 4.4: Is it likely that assessment of the outcome was influenced by knowledge of intervention received?	No information
Domain 4. Bias in measurement of the outcome	Risk-of-bias judgement for measurement of the outcome	Low
Domain 5. Bias in selection of the reported result	5.1 Was the trial analysed in accordance with a pre-specified plan that was finalised before unblinded outcome data were available for analysis ?	Probably no
Domain 5. Bias in selection of the reported result	5.2 Is the numerical result being assessed likely to have been selected, on the basis of the results, from multiple outcome measurements (e.g. scales, definitions, time points) within the outcome domain?	No/Probably no
Domain 5. Bias in selection of the reported result	5.3 Is the numerical result being assessed likely to have been selected, on the basis of the results, from multiple analyses of the data?	No/Probably no
Domain 5. Bias in selection of the reported result	Risk-of-bias judgement for selection of the reported result	Low

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	Low
Overall bias and Directness	Overall Directness	Directly applicable

Mortimer, 2015

Bibliographic Reference	Mortimer, Nathan J; Rhee, Joel; Guy, Rebecca; Hayen, Andrew; Lau, Annie Y S; A web-based personally controlled health management system increases sexually transmitted infection screening rates in young people: a randomized controlled trial.; Journal of the American Medical Informatics Association : JAMIA; 2015; vol. 22 (no. 4); 805-14

Study details

Trial registration number and/or trial name	None
Study type	Randomised controlled trial (RCT)
Study location	Australia
Study setting	University
Study dates	t between April and August 2013
Sources of funding	National Health and Medical Research Council (NHMRC) Centre of Research Excellence in Informatics and E-Health (1032664), and the HCF Health and Medical Research Foundation.
Inclusion criteria	Access to the internet Age 18-29 English language Access to valid email account
Intervention(s)	Upon completion of the baseline survey, participants randomly allocated to the intervention group were presented with a mandatory 3- minute online tutorial that provided information about how to use the various features of the Healthy.me PCHMS. After completing the tutorial, these participants were redirected to the Healthy.me PCHMS to create a user account. The length of time that participants in the intervention group had access to the Healthy.me PCHMS varied, dependent on the date of recruitment. During the study, the Healthy.me PCHMS provided participants in the intervention group with evidence-based information about sexual health, and indications and procedures for STI testing. The intervention was not intended to modify the standard procedures of healthcare provision by the healthcare providers that participants may have chosen to visit during the study The Healthy.me PCHMS intervention employed in this study consisted of a variety of features and was intended to educate participants and facilitate a change in their health-seeking behaviours. Figure 1 demonstrates the PCHMS interface and several of its features which included: a Personal Health Record (1), a ‘Pillbox’ (2) to record medication details, a schedule (3) for recording and reminding of health-related tasks, a location to record

	details of the participants' healthcare team (4), educational content (5) adapted from NSW Health resources,27 social features (6), and an online appointment booking service (7).The online appointment booking service and forum were the primary methods via which access to health providers was facilitated and simplified for participants in the intervention group. Further information regarding these features can be found in the previously published articles discussing other health-related applications of the Healthy.me PCHMS.17,2
Comparator	Upon completion of the baseline survey, participants randomly allocated to the control group were redirected to a static webpage informing them of their allocation. They were advised that they would be contacted to complete a follow-up survey upon conclusion of the study
Outcome measures	STI Testing Behaviour STI testing intention Attitude towards STI testing Speaking to a health practitioner about STIs
Number of participants	Total: 747. 369 in intervention, 378 in control group.
Duration of follow-up	Varied (October 2013, regardless of recruitment date)
Loss to follow-up	219 lost from intervention, leaving 150 in final analysis. 153 lost from control group, leaving 225 in final analysis.
Methods of analysis	Primary Analysis A complete case analysis was performed using the data of all eligible participants who completed the follow-up survey. Pearson's chi square test was used to identify any significant difference between the proportion of participants in the control and intervention groups who reported being tested for STIs during the study. The inverse of the absolute risk difference was then used to determine the 'number needed to treat' (NNT). Binary logistic regression was employed to adjust for potential confounding factors or differences in baseline characteristics that were expected to be predictive of the outcome, including: age, gender, university faculty, sexual activity, number of sexual partners, condom use, previous STI testing, and previous infection.34 Both adjusted and un-adjusted analyses are presented. Secondary Analyses A single pre-specified subgroup analysis, using a statistical test of interaction,35 was conducted to assess the heterogeneity of intervention effect between those participants who reported a history of sexual activity and those who reported having never been sexually active at follow-up.36,37 This provided an estimate of the intervention effect size among those participants for whom the primary outcome is most relevant. Complete case analysis of the secondary outcomes was conducted using (i) Pearson's chi-square test to identify any significant difference between

	the intervention and control groups in relation to the proportion of participants who reported visiting a healthcare professional for any sexual-health-related concerns during the study, and (ii) the Mantel-Haenszel chi-square test for comparing participants' attitudes and intentions regarding getting tested for STIs
Additional comments	PCHMS = personally controlled health management system

Study arms

PCHMS access (N = 150)
intervention group - immediate online PCHMS access

No access (N = 378)
Control group

Characteristics

Arm-level characteristics

Characteristic	PCHMS access (N = 150)	No access (N = 378)
Age (Mean) Mean (SD)	21.8 (2.9)	21.3 (2.8)
% Female Nominal	58	58.7
Student (%) Nominal	96.7	98.2
Previous sexual activity (%) Nominal	73.3	69.3
None Nominal	35.3	40.9
one Nominal	51.3	45.8
2-3 Nominal	8.7	10
4 or more Nominal	4.7	2.7
Previous sex without condoms (%) Nominal	53.3	53.8

Characteristic	PCHMS access (N = 150)	No access (N = 378)
Previous STI test (%) Nominal	40	31.6
Previous STI diagnosis (%) Nominal	6.7	4.4

Critical appraisal - GUT Cochrane Risk of Bias tool (RoB 2.0) Normal RCT

Section	Question	Answer
Domain 1: Bias arising from the randomisation process	1. 1. Was the allocation sequence random?	Yes
Domain 1: Bias arising from the randomisation process	1. 2. Was the allocation sequence concealed until participants were enrolled and assigned to interventions?	Yes
Domain 1: Bias arising from the randomisation process	1.3 Did baseline differences between intervention groups suggest a problem with the randomisation process?	Probably no
Domain 1: Bias arising from the randomisation process	Risk of bias judgement for the randomisation process	Low
Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention)	2.1. Were participants aware of their assigned intervention during the trial?	Yes
Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention)	2.2. Were carers and people delivering the interventions aware of participants' assigned intervention during the trial?	No
Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention)	2.3. If Y/PY/NI to 2.1 or 2.2: Were there deviations from the intended intervention that arose because of the experimental context?	No information
Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention)	2.4. If Y/PY to 2.3: Were these deviations from intended intervention balanced between groups?	No information
Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention)	2.5 If N/PN/NI to 2.4: Were these deviations likely to have affected the outcome?	No information.

Section	Question	Answer
Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention)	2.6 Was an appropriate analysis used to estimate the effect of assignment to intervention?	Probably no
Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention)	2.7 If N/PN/NI to 2.6: Was there potential for a substantial impact (on the result) of the failure to analyse participants in the group to which they were randomized?	Probably no
Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention)	Risk of bias for deviations from the intended interventions (effect of assignment to intervention)	Low
Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention)	2.1. Were participants aware of their assigned intervention during the trial?	Yes
Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention)	2.2. Were carers and people delivering the interventions aware of participants' assigned intervention during the trial?	No
Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention)	2.3. If Y/PY/NI to 2.1 or 2.2: Were important co-interventions balanced across intervention groups?	No information
Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention)	2.4. Could failures in implementing the intervention have affected the outcome?	Probably yes
Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention)	2.5. Did study participants adhere to the assigned intervention regimen?	Probably yes
Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention)	2.6. If N/PN/NI to 2.3 or 2.5 or Y/PY/NI to 2.4: Was an appropriate analysis used to estimate the effect of adhering to the intervention?	Probably no
Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention)	Risk of bias judgement for deviations from the intended interventions (effect of adhering to intervention)	Some concerns

Section	Question	Answer
Domain 3. Bias due to missing outcome data	3.1 Were data for this outcome available for all, or nearly all, participants randomised?	No
Domain 3. Bias due to missing outcome data	3.2 If N/PN/NI to 3.1: Is there evidence that result was not biased by missing outcome data?	No
Domain 3. Bias due to missing outcome data	3.3 If N/PN to 3.2: Could missingness in the outcome depend on its true value?	Probably yes
Domain 3. Bias due to missing outcome data	3.4 If Y/PY/NI to 3.3: Do the proportions of missing outcome data differ between intervention groups?	Yes
Domain 3. Bias due to missing outcome data	3.5 If Y/PY/NI to 3.3: Is it likely that missingness in the outcome depended on its true value?	Probably yes
Domain 3. Bias due to missing outcome data	Risk-of-bias judgement for missing outcome data	High
Domain 4. Bias in measurement of the outcome	4.1 Was the method of measuring the outcome inappropriate?	Yes
Domain 4. Bias in measurement of the outcome	4.2 Could measurement or ascertainment of the outcome have differed between intervention groups ?	No
Domain 4. Bias in measurement of the outcome	4.3 If N/PN/NI to 4.1 and 4.2: Were outcome assessors aware of the intervention received by study participants ?	No
Domain 4. Bias in measurement of the outcome	4.4 If Y/PY/NI to 4.3: Could assessment of the outcome have been influenced by knowledge of intervention received?	No information
Domain 4. Bias in measurement of the outcome	4.5 If Y/PY/NI to 4.4: Is it likely that assessment of the outcome was influenced by knowledge of intervention received?	No information
Domain 4. Bias in measurement of the outcome	Risk-of-bias judgement for measurement of the outcome	Low
Domain 5. Bias in selection of the reported result	5.1 Was the trial analysed in accordance with a pre-specified plan that was finalised before unblinded outcome data were available for analysis ?	Probably no
Domain 5. Bias in selection of the reported result	5.2 Is the numerical result being assessed likely to have been selected, on the basis of the results, from multiple outcome	No/Probably no

Section	Question	Answer
	measurements (e.g. scales, definitions, time points) within the outcome domain?	
Domain 5. Bias in selection of the reported result	5.3 Is the numerical result being assessed likely to have been selected, on the basis of the results, from multiple analyses of the data?	No/Probably no
Domain 5. Bias in selection of the reported result	Risk-of-bias judgement for selection of the reported result	Low
Overall bias and Directness	Risk of bias judgement	Some concerns
Overall bias and Directness	Overall Directness	Directly applicable

Niza, 2014

Bibliographic Reference	Niza, Claudia; Rudisill, Caroline; Dolan, Paul; Vouchers versus Lotteries: What works best in promoting Chlamydia screening? A cluster randomised controlled trial.; Applied economic perspectives and policy; 2014; vol. 36 (no. 1); 109-124

Study details

Trial registration number and/or trial name	None
Study type	Cluster randomised controlled trial
Study location	London, UK
Study setting	University halls of residence
Study dates	Not provided
Sources of funding	Strategic Award from the Wellcome Trust Biomedical Ethics Programme
Inclusion criteria	Age 18-24 Living in student halls Eligible for national chlamydia screening program
Intervention(s)	The incentives offered were HMV gift cards - HMV stands for His Master's Voice and is a leading entertainment company in the UK - in the form of either a £5 voucher or a £200 lottery. HMV is a retailing company in the area of entertainment with a range of products including audio, books, Blu-ray discs, CDs, computer software and hardware, DVDs, video games, posters, as well as an increasing range of clothing and fashion items. The £5 voucher value was chosen as a small incentive to correspond with the relatively effortless task. The £200 lottery was selected to be sufficiently engaging for students. Participants were not informed of the likelihood to win the lottery (e.g., among how many students would the lottery be drawn) which may carry limitations in its comparison with the voucher as there are no comparable expected values. The offer of incentive was framed as following for the 'gain' interventions: - "If you pick up the screening test and return it, you will gain a £5 HMV voucher," (certain small gain). - "If you pick up the screening test and return, you will gain the chance to participate in a £200 HMV voucher lottery," (uncertain high gain). In the 'loss' interventions, students were informed that: - "If you don't pick up the screening test and/ or don't return it, you will lose a £5 HMV voucher," (loss of a certain small gain). - "If you don't pick up the screening test and/ or don't return it, you will lose the chance to participate in a £200 HMV voucher lottery," (loss of an uncertain high gain). The leaflets included an image of the voucher and the amount

	offered in an attempt to create an endowment effect or psychological sense of ownership
Comparator	No incentive offered
Outcome measures	Number of STI tests
Number of participants	1060 in total. The average number of individuals per cluster was 265, but specific numbers are not provided.
Duration of follow-up	Not provided
Loss to follow-up	n/a
Methods of analysis	Chi2
Additional comments	Limited information available in this paper

Critical appraisal - GUT Cochrane Risk of Bias tool (RoB 2.0) Cluster trials

Section	Question	Answer
1a. Bias arising from the randomisation process	1a. 1. Was the allocation sequence random?	Probably yes
1a. Bias arising from the randomisation process	1a. 2. Is it likely that the allocation sequence was subverted?	No information
1a. Bias arising from the randomisation process	1a. 3. Were there baseline imbalances that suggest a problem with the randomisation process?	Probably yes *(No information to judge this on)*
1a. Bias arising from the randomisation process	Risk of bias judgement for the randomisation process	High
1b. Bias arising from the timing of identification and recruitment of individual participants in relation to timing of randomisation	1b. 1. Were all the individual participants identified before randomisation of clusters (and if the trial specifically recruited patients were they all recruited before randomisation of clusters)?	Yes
1b. Bias arising from the timing of identification and recruitment of individual participants in relation to timing of randomisation	1b. 2. If N/PN/NI to 1b.1: Is it likely that selection of individual participants was affected by knowledge of the intervention?	No information

Section	Question	Answer
1b. Bias arising from the timing of identification and recruitment of individual participants in relation to timing of randomisation	1b. 3. Were there baseline imbalances that suggest differential identification or recruitment of individual participants between arms?	No information
1b. Bias arising from the timing of identification and recruitment of individual participants in relation to timing of randomisation	Risk of bias judgement for the timing of identification and recruitment of individual participants in relation to timing of randomisation	High
2. Bias due to deviations from intended interventions	2.1a Were participants aware that they were in a trial?	No information
2. Bias due to deviations from intended interventions	2.1b If Y/PY/NI to 2.1a: Were participants aware of their assigned intervention during the trial?	Yes
2. Bias due to deviations from intended interventions	2.2. Were carers and trial personnel aware of participants' assigned intervention during the trial?	Yes
2. Bias due to deviations from intended interventions	2.3. If Y/PY/NI to 2.1 or 2.2: Were there deviations from the intended intervention beyond what would be expected in usual practice?	Not applicable
2. Bias due to deviations from intended interventions	2.4. If Y/PY to 2.3: Were these deviations from intended intervention unbalanced between groups and likely to have affected the outcome?	No information
2. Bias due to deviations from intended interventions	2.5a Were any clusters analysed in a group different from the one to which they were assigned?	No information
2. Bias due to deviations from intended interventions	2.5b Were any participants analysed in a group different from the one to which their original cluster was randomised?	No information
2. Bias due to deviations from intended interventions	2.6 If Y/PY/NI to 2.5: Was there potential for a substantial impact (on the estimated effect of intervention) of analysing participants in the wrong group?	No information
2. Bias due to deviations from intended interventions	Risk of bias judgement for deviations from intended interventions	Some concerns
3. Bias due to missing outcome data	3.1a Were outcome data available for all, or nearly all, clusters randomised?	Probably yes

Section	Question	Answer
3. Bias due to missing outcome data	3.1b Were outcome data available for all, or nearly all, participants within clusters?	No information
3. Bias due to missing outcome data	3.2 If N/PN/NI to 3.1a or 3.1b: Are the proportions of missing outcome data and reasons for missing outcome data similar across intervention groups?	No information
3. Bias due to missing outcome data	3.3 If N/PN/NI to 3.1a or 3.1b: Is there evidence that results were robust to the presence of missing outcome data?	No information
3. Bias due to missing outcome data	Risk of bias judgement for missing outcome data	High
4. Bias in measurement of the outcome	4.1a Were outcome assessors aware that a trial was taking place?	Yes
4. Bias in measurement of the outcome	4.1b If Y/PY/NI to 4.1: Were outcome assessors aware of the intervention received by study participants?	Yes
4. Bias in measurement of the outcome	4.2 If Y/PY/NI to 4.1: Was the assessment of the outcome likely to be influenced by knowledge of intervention received?	No
4. Bias in measurement of the outcome	Risk of bias judgement for measurement of the outcome	Low
5. Bias in selection of the reported result	5.1 Are the reported outcome data likely to have been selected, on the basis of the results, from multiple outcome measurements (e.g. scales, definitions, time points) within the outcome domain?	No/Probably no
5. Bias in selection of the reported result	5.2 Are the reported outcome data likely to have been selected, on the basis of the results, from multiple analyses of the data?	No/Probably no
5. Bias in selection of the reported result	Risk of bias for selection of the reported result	Low
Overall bias and Directness	Risk of bias judgement	High
Overall bias and Directness	Overall Directness	Directly applicable

Reagan, 2012

Bibliographic Reference	Reagan, Mary M; Xu, Hanna; Shih, Shirley L; Secura, Gina M; Peipert, Jeffrey F; A randomized trial of home versus clinic-based sexually transmitted disease screening among men.; Sexually transmitted diseases; 2012; vol. 39 (no. 11); 842-7

Study details

Trial registration number and/or trial name	None
Study type	Randomised controlled trial (RCT)
Study location	St. Louis, Missouri, USA
Study setting	Home and clinic
Study dates	June 2010 and September 2011
Sources of funding	Study funded by an Anonymous Foundation and Grant Numbers UL1 RR024992 and TL1 RR024995 from the Clinical and Translational Science Award (CTSA) program of the National Center for Research Resources (NCRR), a component of the National Institutes of Health (NIH), and NIH Roadmap for Medical Research. This work was also supported by a grant from the Doris Duke Charitable Foundation to Washington University in St. Louis School of Medicine to fund Clinical Research Fellow Hanna Xu.
Inclusion criteria	Age 18-45 English language Male Location St Louis
Intervention(s)	Urine collection and screening methods were the same for both experimental arms. All men were provided the following for self-sample urine collection: a sterile urine collection cup, an NAAT urine transport tube, and detailed, step-by-step instructions with photographs that explained how to collect and transfer the specimen. Each participant collected his own urine sample in the collection cup, and subsequently transferred the sample into the NAAT transport tube. A vacuum seal created between the collection cup and the NAAT tube facilitated transfer and eliminated leakage or overspill. Men randomized to home-based screening were mailed the collection kit along with written and visual instructions of how to return their urine sample in the NAAT tube with the prepaid, preaddressed mailer included, which complied with Department of Transport and U.S. Postal Service regulations.
Comparator	Men randomized to clinic-based screening were given the collection kit upon arrival to the clinic and returned their urine specimens in the NAAT tube to research staff

Outcome measures	Intervention Acceptability Attitude towards STI testing STIs detected
Number of participants	200 in total: 100 in clinic group and 100 in home group
Duration of follow-up	10-12 weeks
Loss to follow-up	35 from the clinic group and 36 from the home group did not complete the questionnaire
Methods of analysis	We analysed baseline demographic and behavioural characteristics by randomization group using Student's t-tests and chi-square analyses. The primary outcome of interest was the percent of screening kits completed within each group. Multivariable logistic regression was used to determine the relative risk of STD screening by randomization group after adjusting for age, race, and education. All analyses were conducted using STATA (College Station, TX) version 10.0.
Additional comments	Tables missing from main document

Study arms

Clinic test (N = 100)
Clinic based STI screening

Home test (N = 100)
Home based STI screening

Characteristics

Arm-level characteristics

Characteristic	Clinic test (N = 100)	Home test (N = 100)
Age (Mean) Mean (SD)	31.2 (*empty data*)	30.3 (*empty data*)
Single (%) Nominal	59	61
High school or less education (%) Nominal	57	44

Critical appraisal - GUT Cochrane Risk of Bias tool (RoB 2.0) Normal RCT

Section	Question	Answer
Domain 1: Bias arising from the randomisation process	1. 1. Was the allocation sequence random?	Yes
Domain 1: Bias arising from the randomisation process	1. 2. Was the allocation sequence concealed until participants were enrolled and assigned to interventions?	Probably yes
Domain 1: Bias arising from the randomisation process	1.3 Did baseline differences between intervention groups suggest a problem with the randomisation process?	Probably no
Domain 1: Bias arising from the randomisation process	Risk of bias judgement for the randomisation process	Low
Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention)	2.1. Were participants aware of their assigned intervention during the trial?	Yes
Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention)	2.2. Were carers and people delivering the interventions aware of participants' assigned intervention during the trial?	Yes
Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention)	2.3. If Y/PY/NI to 2.1 or 2.2: Were there deviations from the intended intervention that arose because of the experimental context?	No/Probably no
Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention)	2.4. If Y/PY to 2.3: Were these deviations from intended intervention balanced between groups?	No information
Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention)	2.5 If N/PN/NI to 2.4: Were these deviations likely to have affected the outcome?	No information
Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention)	2.6 Was an appropriate analysis used to estimate the effect of assignment to intervention?	Probably yes
Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention)	2.7 If N/PN/NI to 2.6: Was there potential for a substantial impact (on the result) of the failure to analyse participants in the group to which they were randomized?	No information

Section	Question	Answer
Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention)	Risk of bias for deviations from the intended interventions (effect of assignment to intervention)	Low
Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention)	2.1. Were participants aware of their assigned intervention during the trial?	Yes
Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention)	2.2. Were carers and people delivering the interventions aware of participants' assigned intervention during the trial?	Yes
Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention)	2.3. If Y/PY/NI to 2.1 or 2.2: Were important co-interventions balanced across intervention groups?	No information
Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention)	2.4. Could failures in implementing the intervention have affected the outcome?	No
Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention)	2.5. Did study participants adhere to the assigned intervention regimen?	Yes
Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention)	2.6. If N/PN/NI to 2.3 or 2.5 or Y/PY/NI to 2.4: Was an appropriate analysis used to estimate the effect of adhering to the intervention?	No information
Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention)	Risk of bias judgement for deviations from the intended interventions (effect of adhering to intervention)	Low
Domain 3. Bias due to missing outcome data	3.1 Were data for this outcome available for all, or nearly all, participants randomised?	Yes
Domain 3. Bias due to missing outcome data	3.2 If N/PN/NI to 3.1: Is there evidence that result was not biased by missing outcome data?	No information
Domain 3. Bias due to missing outcome data	3.3 If N/PN to 3.2: Could missingness in the outcome depend on its true value?	No information

Section	Question	Answer
Domain 3. Bias due to missing outcome data	3.4 If Y/PY/NI to 3.3: Do the proportions of missing outcome data differ between intervention groups?	No information
Domain 3. Bias due to missing outcome data	3.5 If Y/PY/NI to 3.3: Is it likely that missingness in the outcome depended on its true value?	No information
Domain 3. Bias due to missing outcome data	Risk-of-bias judgement for missing outcome data	Low
Domain 4. Bias in measurement of the outcome	4.1 Was the method of measuring the outcome inappropriate?	Yes
Domain 4. Bias in measurement of the outcome	4.2 Could measurement or ascertainment of the outcome have differed between intervention groups ?	No
Domain 4. Bias in measurement of the outcome	4.3 If N/PN/NI to 4.1 and 4.2: Were outcome assessors aware of the intervention received by study participants ?	Yes
Domain 4. Bias in measurement of the outcome	4.4 If Y/PY/NI to 4.3: Could assessment of the outcome have been influenced by knowledge of intervention received?	No
Domain 4. Bias in measurement of the outcome	4.5 If Y/PY/NI to 4.4: Is it likely that assessment of the outcome was influenced by knowledge of intervention received?	No information
Domain 4. Bias in measurement of the outcome	Risk-of-bias judgement for measurement of the outcome	Low
Domain 5. Bias in selection of the reported result	5.1 Was the trial analysed in accordance with a pre-specified plan that was finalised before unblinded outcome data were available for analysis ?	Probably no
Domain 5. Bias in selection of the reported result	5.2 Is the numerical result being assessed likely to have been selected, on the basis of the results, from multiple outcome measurements (e.g. scales, definitions, time points) within the outcome domain?	No/Probably no
Domain 5. Bias in selection of the reported result	5.3 Is the numerical result being assessed likely to have been selected, on the basis of the results, from multiple analyses of the data?	No/Probably no
Domain 5. Bias in selection of the reported result	Risk-of-bias judgement for selection of the reported result	Low

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	Low
Overall bias and Directness	Overall Directness	Partially applicable

Richens, 2010

Bibliographic Reference	Richens, J; Copas, A; Sadiq, ST; Kingori, P; McCarthy, O; Jones, V; Hay, P; Miles, K; Gilson, R; Imrie, J; et, al.; A randomised controlled trial of computer-assisted interviewing in sexual health clinics; Sexually transmitted infections; 2010; vol. 86 (no. 4); 310-314

Study details

Trial registration number and/or trial name	Trial registration: ISRCTN: 97674664
Study type	Randomised controlled trial (RCT)
Study location	London, UK
Study setting	Sexual health clinic
Study dates	Recruitment started in June 2005 and closed in July 2006.
Sources of funding	Medical Research Council
Inclusion criteria	Age Over 16 Female Male
Exclusion criteria	Unable to read English
Intervention(s)	1. Computer-assisted self-interview (CASI), using a tablet (touchscreen) computer in private. The electronic interview followed the format of the clinical proforma used by clinicians at each clinic for standard care. The 7 patient would then be assessed by a clinician provided with a print-out generated from the interview. 2. Computer-assisted personal interview (CAPI), patient and clinician viewing the screen together, using the same interview as in the CASI, but with data input by the clinician. On completion of the interview the clinician generated a print-out to place in the clinic notes
Comparator	3. Pen and paper interview (PAPI) with a clinician following the normal clinic practice of completing a proforma with the patient (usual care arm). The data from the clinic notes was subsequently transferred into same electronic format as the CASI and CAPI interviews by research staff.
Outcome measures	STI Testing Behaviour Number of STI tests

	STIs detected Referral to health counsellors Identification of contraceptive needs Disclosure of sexual history
Number of participants	2351 in total. 801, 763 and 787 patients randomly allocated receive CASI, CAPI and PAPI. 795, 744 and 779 available for intention-to-treat analysis.
Duration of follow-up	None
Loss to follow-up	
Methods of analysis	Analysis was based on the study arm to which the patient was randomised (intentionto-treat). The principal comparisons were the pairwise comparisons between study arms, with PAPI taken as the comparison arm as it is the current standard. The majority of outcomes are binary. For these the odds ratio for one study arm relative to the other were used as the measure of effect, and these were adjusted for gender and clinic venue through logistic regression. For the first primary outcome (patterns of STI diagnostic testing), with 3 ordered categories, ordinal regression was used. The odds ratio was also used as the measure of effect, calculated under an assumption of proportional odds. To measure the effect of an interview method relative to another for the behavioural outcomes, a summary odds ratio was calculated, pooling information from seven outcomes. This was done using generalized estimation equations (GEE), as was successfully applied to an earlier study to compare reporting between interview methods in the general population.20 As a subsidiary analysis, odds ratios were also calculated for each individual behavioural outcome, and testing for heterogeneity was done to establish whether the difference between study arms was broadly similar across the seven behaviours or not. As a form of subgroup analysis, tests were carried out to see whether differences between arms varied by gender or by clinic.
Additional comments	Baseline characteristics provided in terms of clinics rather than study arms

Study arms

CASI (N = 801)
Computer-assisted self-interview

CAPI (N = 763)
Computer-assisted personal interview

PAPI (N = 787)
Pen and paper interview

Critical appraisal - GUT Cochrane Risk of Bias tool (RoB 2.0) Normal RCT

Section	Question	Answer
Domain 1: Bias arising from the randomisation process	1. 1. Was the allocation sequence random?	Yes
Domain 1: Bias arising from the randomisation process	1. 2. Was the allocation sequence concealed until participants were enrolled and assigned to interventions?	Probably yes
Domain 1: Bias arising from the randomisation process	1.3 Did baseline differences between intervention groups suggest a problem with the randomisation process?	No information
Domain 1: Bias arising from the randomisation process	Risk of bias judgement for the randomisation process	Some concerns
Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention)	2.1. Were participants aware of their assigned intervention during the trial?	Yes
Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention)	2.2. Were carers and people delivering the interventions aware of participants' assigned intervention during the trial?	Yes
Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention)	2.3. If Y/PY/NI to 2.1 or 2.2: Were there deviations from the intended intervention that arose because of the experimental context?	Yes/Probably yes
Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention)	2.4. If Y/PY to 2.3: Were these deviations from intended intervention balanced between groups?	Probably no
Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention)	2.5 If N/PN/NI to 2.4: Were these deviations likely to have affected the outcome?	Probably yes
Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention)	2.6 Was an appropriate analysis used to estimate the effect of assignment to intervention?	Yes

Section	Question	Answer
Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention)	2.7 If N/PN/NI to 2.6: Was there potential for a substantial impact (on the result) of the failure to analyse participants in the group to which they were randomized?	Probably yes
Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention)	Risk of bias for deviations from the intended interventions (effect of assignment to intervention)	Some concerns
Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention)	2.1. Were participants aware of their assigned intervention during the trial?	Yes
Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention)	2.2. Were carers and people delivering the interventions aware of participants' assigned intervention during the trial?	Yes
Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention)	2.3. If Y/PY/NI to 2.1 or 2.2: Were important co-interventions balanced across intervention groups?	Probably yes
Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention)	2.4. Could failures in implementing the intervention have affected the outcome?	Probably yes
Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention)	2.5. Did study participants adhere to the assigned intervention regimen?	Probably yes
Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention)	2.6. If N/PN/NI to 2.3 or 2.5 or Y/PY/NI to 2.4: Was an appropriate analysis used to estimate the effect of adhering to the intervention?	Probably no
Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention)	Risk of bias judgement for deviations from the intended interventions (effect of adhering to intervention)	Some concerns
Domain 3. Bias due to missing outcome data	3.1 Were data for this outcome available for all, or nearly all, participants randomised?	No information *(Figure referenced is missing)*

Section	Question	Answer
Domain 3. Bias due to missing outcome data	3.2 If N/PN/NI to 3.1: Is there evidence that result was not biased by missing outcome data?	No information
Domain 3. Bias due to missing outcome data	3.3 If N/PN to 3.2: Could missingness in the outcome depend on its true value?	No information
Domain 3. Bias due to missing outcome data	3.4 If Y/PY/NI to 3.3: Do the proportions of missing outcome data differ between intervention groups?	No information
Domain 3. Bias due to missing outcome data	3.5 If Y/PY/NI to 3.3: Is it likely that missingness in the outcome depended on its true value?	No information
Domain 3. Bias due to missing outcome data	Risk-of-bias judgement for missing outcome data	Some concerns
Domain 4. Bias in measurement of the outcome	4.1 Was the method of measuring the outcome inappropriate?	Yes
Domain 4. Bias in measurement of the outcome	4.2 Could measurement or ascertainment of the outcome have differed between intervention groups ?	Probably no
Domain 4. Bias in measurement of the outcome	4.3 If N/PN/NI to 4.1 and 4.2: Were outcome assessors aware of the intervention received by study participants ?	Probably yes
Domain 4. Bias in measurement of the outcome	4.4 If Y/PY/NI to 4.3: Could assessment of the outcome have been influenced by knowledge of intervention received?	No
Domain 4. Bias in measurement of the outcome	4.5 If Y/PY/NI to 4.4: Is it likely that assessment of the outcome was influenced by knowledge of intervention received?	No information
Domain 4. Bias in measurement of the outcome	Risk-of-bias judgement for measurement of the outcome	Low
Domain 5. Bias in selection of the reported result	5.1 Was the trial analysed in accordance with a pre-specified plan that was finalised before unblinded outcome data were available for analysis ?	Yes
Domain 5. Bias in selection of the reported result	5.2 Is the numerical result being assessed likely to have been selected, on the basis of the results, from multiple outcome measurements (e.g. scales, definitions, time points) within the outcome domain?	No/Probably no

Section	Question	Answer
Domain 5. Bias in selection of the reported result	5.3 Is the numerical result being assessed likely to have been selected, on the basis of the results, from multiple analyses of the data?	No/Probably no
Domain 5. Bias in selection of the reported result	Risk-of-bias judgement for selection of the reported result	Low
Overall bias and Directness	Risk of bias judgement	Some concerns
Overall bias and Directness	Overall Directness	Directly applicable

Roth, 2015

Bibliographic Reference	Roth, Alexis M; Van Der Pol, Barbara; Fortenberry, J Dennis; Dodge, Brian; Reece, Michael; Certo, David; Zimet, Gregory D; The impact of brief messages on HSV-2 screening uptake among female defendants in a court setting: a randomized controlled trial utilizing prospect theory.; Journal of health communication; 2015; vol. 20 (no. 2); 230-6

Study details

Other publications associated with this study included in review	
Trial registration number and/or trial name	None
Study type	Randomised controlled trial (RCT)
Study location	Indianapolis, Indiana, USA
Study setting	The Indianapolis Community Court, a free-standing, neighbourhood-based court handling misdemeanour criminal cases.
Study dates	From September 2009 to 2010
Sources of funding	The authors acknowledge the support of Indiana University School of Public Health-Bloomington Faculty Research Support Program, Indiana University School of Medicine Infectious Disease Laboratory & Division of Adolescent Medicine, and the Indianapolis Community Court.
Inclusion criteria	Female
Exclusion criteria	History of genital herpes
Intervention(s)	Gain frame: Today you have the opportunity to be tested for genital herpes for free. You will be tested using blood obtained from a finger stick and will receive your results within 30 minutes. Based on the best information that we have, we think there is about a 70% chance that the test will show that you do not have herpes. Loss frame: Today you have the opportunity to be tested for genital herpes for free. You will be tested using blood obtained from a finger stick and will receive your results within 30 minutes. Based on the best information that we have, we think there is about a 30% chance that the test will show that you do have herpes.

Comparator	Control: Today you have the opportunity to be tested for genital herpes for free. You will be tested using blood obtained from a finger stick and will receive your results within 30 minutes.
Outcome measures	Attitude towards STI testing STI knowledge
Number of participants	143 in total: 51 in gain group, 48 in loss group, and 44 in the control group
Duration of follow-up	None
Loss to follow-up	
Methods of analysis	Group comparisons were assessed using chi-squared tests (categorical variables) and independent-samples t tests (continuous variables). Binary logistic regression was used to assess whether the intervention predicted HSV-2 test acceptance and whether message congruency moderated this effect. Forward stepwise procedures were then performed to identify significant independent predictors. All analyses were performed using SPSS 19.0.

Study arms

Gain framed message (N = 51)

Loss framed message (N = 48)

Control group (N = 44)

Characteristics

Arm-level characteristics

Characteristic	Gain framed message (N = 51)	Loss framed message (N = 48)	Control group (N = 44)
Age (Mean) Mean (SD)	34.41 (1.5)	31.15 (1.6)	32.86 (1.6)
Latino Nominal	2	6.3	6.8
Black Nominal	51	41.7	40.9
Other Nominal	49	58.3	59.1

Characteristic	Gain framed message (N = 51)	Loss framed message (N = 48)	Control group (N = 44)
Less than high school Nominal	8.3	8.3	4.5
High school Nominal	72.9	85.4	75
College Nominal	18.8	63.3	20.5
Unemployment (%) Nominal	70.6	70.8	81.8
Arrested on prostitution charge (%) Nominal	23.5	20.8	22.7
Previous STI test (%) Nominal	72.5	77.1	75
Previous STI diagnoses (%) Nominal	72.5	72.9	68.2
1-5 Nominal	19.6	22.9	15.9
6-10 Nominal	18.8	23.5	25
More than 10 Nominal	56.9	58.3	59.1
Currently have STI symptoms (%) Nominal	21.6	14.6	13.6

Critical appraisal - GUT Cochrane Risk of Bias tool (RoB 2.0) Normal RCT

Section	Question	Answer
Domain 1: Bias arising from the randomisation process	1. 1. Was the allocation sequence random?	Probably yes

Section	Question	Answer
Domain 1: Bias arising from the randomisation process	1. 2. Was the allocation sequence concealed until participants were enrolled and assigned to interventions?	Probably yes
Domain 1: Bias arising from the randomisation process	1.3 Did baseline differences between intervention groups suggest a problem with the randomisation process?	No
Domain 1: Bias arising from the randomisation process	Risk of bias judgement for the randomisation process	Low
Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention)	2.1. Were participants aware of their assigned intervention during the trial?	Yes
Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention)	2.2. Were carers and people delivering the interventions aware of participants' assigned intervention during the trial?	Yes
Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention)	2.3. If Y/PY/NI to 2.1 or 2.2: Were there deviations from the intended intervention that arose because of the experimental context?	No information
Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention)	2.4. If Y/PY to 2.3: Were these deviations from intended intervention balanced between groups?	Probably no
Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention)	2.5 If N/PN/NI to 2.4: Were these deviations likely to have affected the outcome?	No information
Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention)	2.6 Was an appropriate analysis used to estimate the effect of assignment to intervention?	Yes
Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention)	2.7 If N/PN/NI to 2.6: Was there potential for a substantial impact (on the result) of the failure to analyse participants in the group to which they were randomized?	No information
Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention)	Risk of bias for deviations from the intended interventions (effect of assignment to intervention)	Low

Section	Question	Answer
Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention)	2.1. Were participants aware of their assigned intervention during the trial?	Yes
Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention)	2.2. Were carers and people delivering the interventions aware of participants' assigned intervention during the trial?	Yes
Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention)	2.3. If Y/PY/NI to 2.1 or 2.2: Were important co-interventions balanced across intervention groups?	No information
Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention)	2.4. Could failures in implementing the intervention have affected the outcome?	Probably no
Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention)	2.5. Did study participants adhere to the assigned intervention regimen?	No information
Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention)	2.6. If N/PN/NI to 2.3 or 2.5 or Y/PY/NI to 2.4: Was an appropriate analysis used to estimate the effect of adhering to the intervention?	No information
Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention)	Risk of bias judgement for deviations from the intended interventions (effect of adhering to intervention)	Low
Domain 3. Bias due to missing outcome data	3.1 Were data for this outcome available for all, or nearly all, participants randomised?	Yes
Domain 3. Bias due to missing outcome data	3.2 If N/PN/NI to 3.1: Is there evidence that result was not biased by missing outcome data?	No information
Domain 3. Bias due to missing outcome data	3.3 If N/PN to 3.2: Could missingness in the outcome depend on its true value?	No information
Domain 3. Bias due to missing outcome data	3.4 If Y/PY/NI to 3.3: Do the proportions of missing outcome data differ between intervention groups?	No information

Section	Question	Answer
Domain 3. Bias due to missing outcome data	3.5 If Y/PY/NI to 3.3: Is it likely that missingness in the outcome depended on its true value?	No information
Domain 3. Bias due to missing outcome data	Risk-of-bias judgement for missing outcome data	Low
Domain 4. Bias in measurement of the outcome	4.1 Was the method of measuring the outcome inappropriate?	Yes
Domain 4. Bias in measurement of the outcome	4.2 Could measurement or ascertainment of the outcome have differed between intervention groups ?	No
Domain 4. Bias in measurement of the outcome	4.3 If N/PN/NI to 4.1 and 4.2: Were outcome assessors aware of the intervention received by study participants ?	Yes
Domain 4. Bias in measurement of the outcome	4.4 If Y/PY/NI to 4.3: Could assessment of the outcome have been influenced by knowledge of intervention received?	No
Domain 4. Bias in measurement of the outcome	4.5 If Y/PY/NI to 4.4: Is it likely that assessment of the outcome was influenced by knowledge of intervention received?	No information
Domain 4. Bias in measurement of the outcome	Risk-of-bias judgement for measurement of the outcome	Low
Domain 5. Bias in selection of the reported result	5.1 Was the trial analysed in accordance with a pre-specified plan that was finalised before unblinded outcome data were available for analysis ?	Probably yes
Domain 5. Bias in selection of the reported result	5.2 Is the numerical result being assessed likely to have been selected, on the basis of the results, from multiple outcome measurements (e.g. scales, definitions, time points) within the outcome domain?	No/Probably no
Domain 5. Bias in selection of the reported result	5.3 Is the numerical result being assessed likely to have been selected, on the basis of the results, from multiple analyses of the data?	No/Probably no
Domain 5. Bias in selection of the reported result	Risk-of-bias judgement for selection of the reported result	Low
Overall bias and Directness	Risk of bias judgement	Low
Overall bias and Directness	Overall Directness	Indirectly applicable

Smith, 2015

Bibliographic Reference	Smith, Kirsty S; Hocking, Jane S; Chen, Marcus Y; Fairley, Christopher K; McNulty, Anna M; Read, Phillip; Bradshaw, Catriona S; Tabrizi, Sepehr N; Wand, Handan; Saville, Marion; Rawlinson, William; Garland, Suzanne M; Donovan, Basil; Kaldor, John M; Guy, Rebecca J; Dual Intervention to Increase Chlamydia Retesting: A Randomized Controlled Trial in Three Populations.; American journal of preventive medicine; 2015; vol. 49 (no. 1); 1-11

Study details

Trial registration number and/or trial name	Australian and New Zealand Clinical Trials Registry on September 9, 2011: ACTRN 12611000968976.
Study location	Melbourne and Sydney, Australia
Study setting	Home and sexual health clinics
Study dates	between 2011 and 2014
Sources of funding	National Health and Medical Research Council of Australia
Inclusion criteria	Age Over 16 Location Within catchment area for clinics Access to a mobile phone Diagnosed chlamydia
Exclusion criteria	Unable to read English HIV positive Unwilling to comply with study requirements Sex workers
Intervention(s)	For participants in the intervention arm, 3 months after chlamydia diagnosis, an SMS was sent by the research team to let the patient know their retest was due and a kit would soon be mailed to them. The home collection kit contained the collection device(s) (women, self-collected vaginal swab; heterosexual men, UriSWAB for urine collection [Copan Diagnostics, Murrieta, CA]; MSM, UriSwab and rectal swab) plus illustrated collection instructions; a laboratory request form; and a prepaid envelope. The swabs and request form were pre-labelled with identifying information. The collection kit was mailed to the patient in an unmarked package by the research team at 3 months. Patients were instructed in a cover letter to collect their specimen(s), package them according to the provided instructions, and mail them to the laboratory in the prepaid envelope.

Comparator	For participants in the control arm, 3 months after chlamydia diagnosis, patients were sent an SMS by the clinic to remind them to return to the clinic for retesting. This is routine practice at the two participating clinics. At one clinic, an opt-out system was used where the SMS was automatically generated on receipt of a positive result, and at the other, the automated SMS system was activated via the electronic patient management system by the attending clinician. Specimens collected at the clinics were tested by the usual pathology provider according to their standard protocol
Outcome measures	Number of STI tests STIs detected
Number of participants	600 in total: 302 in home group, 298 in clinic group.
Duration of follow-up	1-4 months
Loss to follow-up	n/a
Methods of analysis	Analyses were undertaken in 2014 using Stata, version 12.1. The percentage of patients who returned for retesting in each arm (home and clinic); percentage of retesters by risk group (women, heterosexual men, MSM), age group (o25 years, Z25 years), and symptoms at baseline (yes, no); and the percentage of patients who retested positive between 1 and 4 months of a chlamydia diagnosis in each arm and by risk group were assessed with intention-to treat analysis. The per-protocol analyses included (1) among the home testing arm, the percentage who retested at home compared with the clinic and the median time to retest among those who tested at home versus the clinic; and (2) Kaplan–Meier survival analysis to compare the time to retest between study arms and by risk group during the study period. Chlamydia retesting within 1–4 months after a chlamydia diagnosis was calculated as a second test occurring within 1–4 months of an initial positive test. A repeat infection included a positive result from any anatomic site. The effects of the intervention were measured by comparing the percentage who retested; the percentage with a repeat infection in all study arm participants; and the percentage with a repeat positive test in those retested and between the two groups (home versus clinic) using the chi-square test. Kaplan–Meier survival analysis was performed using a Kaplan–Meier plot and the logrank test

Study arms

Home test (N = 302)

the addition of a postal home collection kit to a short message service (SMS) reminder at 3 months

Clinic test (N = 298)

SMS reminder to return to clinic

Characteristics

Arm-level characteristics

Characteristic	Home test (N = 302)	Clinic test (N = 298)
under 25 Nominal	34.8	37.9
Over 25 Nominal	65.2	62.1
Metropolitan Nominal	97.7	95.6
Non-metropolitan Nominal	2.3	4.4
Australia Nominal	49	47.9
Asia Nominal	13.6	9.6
Europe Nominal	25.8	29.1
Other Nominal	11.6	13.4
Previous chlamydia diagnosis (%) Nominal	12.9	11.1
Inconsistent/never Nominal	83	85
Always Nominal	17	15
Zero Nominal	7.3	4.7
one Nominal	35.6	27.5

Critical appraisal - GUT Cochrane Risk of Bias tool (RoB 2.0) Normal RCT

Section	Question	Answer
Domain 1: Bias arising from the randomisation process	1. 1. Was the allocation sequence random?	Yes
Domain 1: Bias arising from the randomisation process	1. 2. Was the allocation sequence concealed until participants were enrolled and assigned to interventions?	Yes
Domain 1: Bias arising from the randomisation process	1.3 Did baseline differences between intervention groups suggest a problem with the randomisation process?	No
Domain 1: Bias arising from the randomisation process	Risk of bias judgement for the randomisation process	Low
Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention)	2.1. Were participants aware of their assigned intervention during the trial?	Yes
Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention)	2.2. Were carers and people delivering the interventions aware of participants' assigned intervention during the trial?	Yes
Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention)	2.3. If Y/PY/NI to 2.1 or 2.2: Were there deviations from the intended intervention that arose because of the experimental context?	No/Probably no
Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention)	2.4. If Y/PY to 2.3: Were these deviations from intended intervention balanced between groups?	No information
Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention)	2.5 If N/PN/NI to 2.4: Were these deviations likely to have affected the outcome?	No information
Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention)	2.6 Was an appropriate analysis used to estimate the effect of assignment to intervention?	Yes
Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention)	2.7 If N/PN/NI to 2.6: Was there potential for a substantial impact (on the result) of the failure to analyse participants in the group to which they were randomized?	No information

Section	Question	Answer
Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention)	Risk of bias for deviations from the intended interventions (effect of assignment to intervention)	Low
Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention)	2.1. Were participants aware of their assigned intervention during the trial?	Yes
Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention)	2.2. Were carers and people delivering the interventions aware of participants' assigned intervention during the trial?	Yes
Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention)	2.3. If Y/PY/NI to 2.1 or 2.2: Were important co-interventions balanced across intervention groups?	No information
Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention)	2.4. Could failures in implementing the intervention have affected the outcome?	Probably no
Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention)	2.5. Did study participants adhere to the assigned intervention regimen?	No information
Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention)	2.6. If N/PN/NI to 2.3 or 2.5 or Y/PY/NI to 2.4: Was an appropriate analysis used to estimate the effect of adhering to the intervention?	No information
Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention)	Risk of bias judgement for deviations from the intended interventions (effect of adhering to intervention)	Low
Domain 3. Bias due to missing outcome data	3.1 Were data for this outcome available for all, or nearly all, participants randomised?	Yes
Domain 3. Bias due to missing outcome data	3.2 If N/PN/NI to 3.1: Is there evidence that result was not biased by missing outcome data?	No information
Domain 3. Bias due to missing outcome data	3.3 If N/PN to 3.2: Could missingness in the outcome depend on its true value?	No information

Section	Question	Answer
Domain 3. Bias due to missing outcome data	3.4 If Y/PY/NI to 3.3: Do the proportions of missing outcome data differ between intervention groups?	No information
Domain 3. Bias due to missing outcome data	3.5 If Y/PY/NI to 3.3: Is it likely that missingness in the outcome depended on its true value?	No information
Domain 3. Bias due to missing outcome data	Risk-of-bias judgement for missing outcome data	Low
Domain 4. Bias in measurement of the outcome	4.1 Was the method of measuring the outcome inappropriate?	Yes
Domain 4. Bias in measurement of the outcome	4.2 Could measurement or ascertainment of the outcome have differed between intervention groups ?	No
Domain 4. Bias in measurement of the outcome	4.3 If N/PN/NI to 4.1 and 4.2: Were outcome assessors aware of the intervention received by study participants ?	No
Domain 4. Bias in measurement of the outcome	4.4 If Y/PY/NI to 4.3: Could assessment of the outcome have been influenced by knowledge of intervention received?	No
Domain 4. Bias in measurement of the outcome	4.5 If Y/PY/NI to 4.4: Is it likely that assessment of the outcome was influenced by knowledge of intervention received?	No information
Domain 4. Bias in measurement of the outcome	Risk-of-bias judgement for measurement of the outcome	Low
Domain 5. Bias in selection of the reported result	5.1 Was the trial analysed in accordance with a pre-specified plan that was finalised before unblinded outcome data were available for analysis ?	Yes
Domain 5. Bias in selection of the reported result	5.2 Is the numerical result being assessed likely to have been selected, on the basis of the results, from multiple outcome measurements (e.g. scales, definitions, time points) within the outcome domain?	No/Probably no
Domain 5. Bias in selection of the reported result	5.3 Is the numerical result being assessed likely to have been selected, on the basis of the results, from multiple analyses of the data?	No/Probably no
Domain 5. Bias in selection of the reported result	Risk-of-bias judgement for selection of the reported result	Low

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	Low
Overall bias and Directness	Overall Directness	Indirectly applicable

van den Broek, 2012

Bibliographic Reference	van den Broek, Ingrid V F; van Bergen, Jan E A M; Brouwers, Elfi E H G; Fennema, Johannes S A; Gotz, Hannelore M; Hoebe, Christian J P A; Koekenbier, Rik H; Kretzschmar, Mirjam; Over, Eelco A B; Schmid, Boris V; Pars, Lydia L; van Ravesteijn, Sander M; van der Sande, Marianne A B; de Wit, G Ardine; Low, Nicola; Op de Coul, Eline L M; Effectiveness of yearly, register based screening for chlamydia in the Netherlands: controlled trial with randomised stepped wedge implementation.; BMJ (Clinical research ed.); 2012; vol. 345; e4316

Study details

Trial registration number and/or trial name	NTR 3071 (Netherlands Trial Register, www. trialregister.nl)
Study type	Cluster randomised controlled trial Controlled trial with randomised stepped wedge implementation in three blocks
Study location	The Netherlands: Amsterdam, Rotterdam, and South Limburg
Study setting	Regional populations
Study dates	From March 2008 to February 2011
Sources of funding	The Chlamydia Screening Implementation was carried out on request of the Ministry of Health, Welfare and Sport. The Dutch organisation for Health Research and Development (ZonMW, project number 12.400.001) funded the project
Inclusion criteria	Age 16-29 Female Male Eligible for national chlamydia screening program Listed on municipal population register
Intervention(s)	The intervention was a register based programme with personalised yearly invitations to be screened for C trachomatis infection sent to the target population. The letter included the address of the programme website (www.chlamydiatest.nl) and a secure login code through which eligible participants could request a kit for self sampling (urine for men, vaginal swab or urine for women).20 Samples could be posted in prepaid secure packaging for testing by means of nucleic acid amplification tests. A single reminder letter was sent to anyone who did not access the website within four weeks, and email reminders were sent to individuals who requested a kit but did not return a specimen within two weeks.24 Test results, with a referral letter for those with positive results, were provided online, with an

	email or text message reminder after 14 and 28 days and a letter by post after six weeks for those who did not access it. Treatment and partner notification were provided by the person's general practitioner or at a local sexually transmitted infections clinic. People with a positive test were sent a retest kit six months after treatment. In Amsterdam and Rotterdam, all people who reported that they ever had sex were asked to request a test kit. In South Limburg, chlamydia prevalence was expected to be lower than in the cities, and test kits were only sent to people completing a risk assessment form that had been developed previously.26 A risk score of ≥6 with the form was compatible with a positivity of 4-5% and excluded 20-30% of potential participants.27 Participants provided informed consent online.
Comparator	The control condition was usual care. Testing for chlamydia is available from general practitioners and at sexually transmitted infections clinics. There was no specific promotion of chlamydia testing during the trial period. Investigators, participants, and laboratory staff could not be blinded to allocation to intervention or control care.
Outcome measures	Number of STI tests STIs detected
Number of participants	invitations were sent to 421 820 individuals in the three regions. Of these, 162 096 received an invitation in each of three consecutive years, showing the mobility of the target population. Altogether, 102 283 samples were returned by 79 173 people, and 4252 cases of chlamydia infection were detected.
Duration of follow-up	6 months
Loss to follow-up	n/a
Methods of analysis	We calculated absolute differences and odds ratios comparing chlamydia test positivity in intervention blocks and control blocks and, within intervention blocks, changes between the first and third rounds. Cluster effects for participation and positivity rates were calculated for round one using multivariable logistic regression with the variable "cluster" added as a second level. Clustering had a modest impact on participation rates (adjusted median odds ratio for cluster 1.14 (95% confidence interval 1.11 to 1.16), P<0.001) and no impact on positivity (median odds ratio 1.03 (1.0 to 1.14)) so we report participation rates adjusted for clustering and positivity rates at the individual level. To account for baseline differences that might bias the estimate of impact on chlamydia positivity we included block allocation, community risk level, and cluster size as covariates and estimated the adjusted odds ratio. Secondary analyses compared changes in chlamydia positivity in each region and in demographic subgroups (age, gender, and ethnic group (based on participant's country of birth and that of his or her parents)). An indicator of socioeconomic status based on income, education level, and employment was available for the lowest level postcode areas (parts of streets) (Netherlands Institute for Social Research). An additional, voluntary set of questions about self reported pelvic inflammatory disease

	in the preceding year was offered to female participants after they had completed the general questionnaire (main question: “Have you been diagnosed with a pelvic infection (an infection in the ovaries or the uterus, not the bladder) in the past 12 months?”). We used SPSS version 18 (IBM Corporation, Somers, New York, USA) and SAS version 9.2 (SAS Institute, USA) for statistical analyses.
Additional comments	Baseline characteristics given by block rather than by intervention vs control, due to cluster design.

Study arms

Home test (N = 269273)

Postal invitations asked people to use an internet site to request a kit for self collection of samples, which would then be sent to regional laboratories for testing

Critical appraisal - GUT Cochrane Risk of Bias tool (RoB 2.0) Cluster trials

Section	Question	Answer
1a. Bias arising from the randomisation process	1a. 1. Was the allocation sequence random?	No
1a. Bias arising from the randomisation process	1a. 2. Is it likely that the allocation sequence was subverted?	No information
1a. Bias arising from the randomisation process	1a. 3. Were there baseline imbalances that suggest a problem with the randomisation process?	No
1a. Bias arising from the randomisation process	Risk of bias judgement for the randomisation process	Some concerns
1b. Bias arising from the timing of identification and recruitment of individual participants in relation to timing of randomisation	1b. 1. Were all the individual participants identified before randomisation of clusters (and if the trial specifically recruited patients were they all recruited before randomisation of clusters)?	Yes
1b. Bias arising from the timing of identification and recruitment of individual participants in relation to timing of randomisation	1b. 2. If N/PN/NI to 1b.1: Is it likely that selection of individual participants was affected by knowledge of the intervention?	No
1b. Bias arising from the timing of identification and recruitment of individual participants in relation to timing of randomisation	1b. 3. Were there baseline imbalances that suggest differential identification or recruitment of individual participants between arms?	No

Section	Question	Answer
1b. Bias arising from the timing of identification and recruitment of individual participants in relation to timing of randomisation	Risk of bias judgement for the timing of identification and recruitment of individual participants in relation to timing of randomisation	Low
2. Bias due to deviations from intended interventions	2.1a Were participants aware that they were in a trial?	Yes
2. Bias due to deviations from intended interventions	2.1b If Y/PY/NI to 2.1a: Were participants aware of their assigned intervention during the trial?	Yes
2. Bias due to deviations from intended interventions	2.2. Were carers and trial personnel aware of participants' assigned intervention during the trial?	Yes
2. Bias due to deviations from intended interventions	2.3. If Y/PY/NI to 2.1 or 2.2: Were there deviations from the intended intervention beyond what would be expected in usual practice?	Probably no
2. Bias due to deviations from intended interventions	2.4. If Y/PY to 2.3: Were these deviations from intended intervention unbalanced between groups and likely to have affected the outcome?	Not applicable
2. Bias due to deviations from intended interventions	2.5a Were any clusters analysed in a group different from the one to which they were assigned?	No
2. Bias due to deviations from intended interventions	2.5b Were any participants analysed in a group different from the one to which their original cluster was randomised?	Yes
2. Bias due to deviations from intended interventions	2.6 If Y/PY/NI to 2.5: Was there potential for a substantial impact (on the estimated effect of intervention) of analysing participants in the wrong group?	Probably no
2. Bias due to deviations from intended interventions	Risk of bias judgement for deviations from intended interventions	Some concerns
3. Bias due to missing outcome data	3.1a Were outcome data available for all, or nearly all, clusters randomised?	Yes
3. Bias due to missing outcome data	3.1b Were outcome data available for all, or nearly all, participants within clusters?	Probably yes
3. Bias due to missing outcome data	3.2 If N/PN/NI to 3.1a or 3.1b: Are the proportions of missing outcome data and	No information

Section	Question	Answer
	reasons for missing outcome data similar across intervention groups?	
3. Bias due to missing outcome data	3.3 If N/PN/NI to 3.1a or 3.1b: Is there evidence that results were robust to the presence of missing outcome data?	Probably Yes
3. Bias due to missing outcome data	Risk of bias judgement for missing outcome data	Low
4. Bias in measurement of the outcome	4.1a Were outcome assessors aware that a trial was taking place?	Yes
4. Bias in measurement of the outcome	4.1b If Y/PY/NI to 4.1: Were outcome assessors aware of the intervention received by study participants?	Yes
4. Bias in measurement of the outcome	4.2 If Y/PY/NI to 4.1: Was the assessment of the outcome likely to be influenced by knowledge of intervention received?	No
4. Bias in measurement of the outcome	Risk of bias judgement for measurement of the outcome	Low
5. Bias in selection of the reported result	5.1 Are the reported outcome data likely to have been selected, on the basis of the results, from multiple outcome measurements (e.g. scales, definitions, time points) within the outcome domain?	No/Probably no
5. Bias in selection of the reported result	5.2 Are the reported outcome data likely to have been selected, on the basis of the results, from multiple analyses of the data?	Yes/Probably yes
5. Bias in selection of the reported result	Risk of bias for selection of the reported result	Some concerns
Overall bias and Directness	Risk of bias judgement	Some concerns
Overall bias and Directness	Overall Directness	Indirectly applicable

Wilson, 2017

Bibliographic Reference	Wilson, Emma; Free, Caroline; Morris, Tim P; Syred, Jonathan; Ahamed, Irrfan; Menon-Johansson, Anatole S; Palmer, Melissa J; Barnard, Sharmani; Rezel, Emma; Baraitser, Paula; Internet-accessed sexually transmitted infection (e-STI) testing and results service: A randomised, single-blind, controlled trial.; PLoS medicine; 2017; vol. 14 (no. 12); e1002479

Study details

Secondary publication of another included study- see primary study for details	
Other publications associated with this study included in review	Wilson 2019
Trial registration number and/or trial name	ISRCTN Registry ISRCTN13354298
Study type	Randomised controlled trial (RCT)
Study location	London Boroughs of Southwark and Lambeth, UK
Study setting	Recruited in community settings to reach individuals who may not use conventional STI testing services. Utilised both face-to-face and online recruitment strategies • Promoted the trial in universities, further education colleges, market stalls, barber shops, bars, and nightclubs in South East London and via Facebook, Twitter, and Grindr (a dating application for gay and bisexual men). • Advocacy and health promotion groups advertised the trial among their networks. The study was promoted in conjunction with a health promotion message, to motivate participants to join the trial and consider taking an STI test.
Study dates	November 2014 to 31 August 2015

Sources of funding	Guys and St Thomas' Charity (UK)
Inclusion criteria	Age 16- 30 Residence in Lambeth or Southwark stated willingness to take an STI test Access to the internet Previous sexual intercourse
Exclusion criteria	Unable to read English Unable to provide consent
Intervention(s)	Participants in the intervention group were sent a text message with the URL of SH:24 (https://www.sh24.org.uk). SH:24 offers free postal self-sampling test kits for chlamydia, gonorrhoea, HIV, and syphilis. Participants who ordered a test kit from SH:24, were required to complete a short order form. Those reporting STI symptoms were advised via a pop-up message to visit their local clinic for immediate treatment. Those reporting complex needs such as depression, drug and alcohol dependency, or exploitative sexual partnerships were telephoned by a clinician and referred to relevant clinical services. All participants could continue to use the online service if they wished. All test kits contained a lancet and collection tube to obtain a blood sample for serological testing for syphilis and HIV. For chlamydia and gonorrhoea, women were sent vaginal swabs and men were sent a container for first-catch urine samples. Test kits for MSM also contained swabs to take pharyngeal and rectal samples. The tests kits included pictorial leaflets with guidance on how to collect the specimens. A video demonstrating blood sample collection was available on Youtube and could be accessed via the SH:24 website. Participants were kept informed of their order via text message. In the text messages, they were asked to contact the SH:24 team with any questions or concerns. After 2 weeks, non-returners were sent reminders via text and resent test kits if required, as per SH:24's protocols. Chlamydia, gonorrhoea, and syphilis test results were delivered by text message. Participants with reactive results for syphilis or positive results for chlamydia or gonorrhoea were signposted to local clinics for confirmatory testing and treatment as necessary. Reactive results for HIV were communicated by phone by a clinician.
Comparator	Participants in the control group were sent the URL of a bespoke website with the contact details, websites, and locations (Google map images) of sexual health clinics in Lambeth and Southwark. These clinics provided usual care via walk-in services. Some clinics also offered an appointment

	service for those with symptoms or complex needs. Those diagnosed with an STI were asked to attend clinic for treatment. All participants were free to use any other sexual health services or interventions during the trial period.
Outcome measures	Intervention Acceptability STI Testing Behaviour STIs detected Treatment received Engagement with the program Speed of test results
Number of participants	Primary outcome data, prior to multiple imputation, were available for 921 (89%) participants in the intervention group and 818 (79%) in the control group.
Duration of follow-up	6 weeks.
Loss to follow-up	11% in intervention arm (n=110) 21% in control group (n=214)
Methods of analysis	The proportions of participants in each group who reported completing a test at 6 weeks, and who were confirmed to have tested via patient record checks. Primary analyses were based on multiply imputed data sets. In all, 1,031 in the intervention group and 1,032 in the control group were included in the analyses. Kaplan Meier plots constructed for time to test and time to treatment.

Study arms

e- STI testing (N = 1031)

Inclusion criteria	Age 16- 30 Residence in Lambeth or Southwark stated willingness to take an STI test Access to the internet

Received SMS with link to e-STI testing site

Usual care (N = 1032)

SMS with link to clinic testing

Characteristics

Arm-level characteristics

Characteristic	e- STI testing (N = 1031)	Usual care (N = 1032)
% Female Nominal	58.6	59
% Male Nominal	41.1	40.9
% transgender Nominal	0.01	0.01
Age (Mean) Mean (SD)	23 (3.5)	23 (3.6)
MSM Nominal	12.5	12.9
Other Nominal	86.3	86
one Nominal	29.3	29.5
2 or more Nominal	70.7	70.5
White Nominal	75.6	72.6
Black Nominal	7.9	10.7
Asian Nominal	6.8	5.5
Mixed Nominal	8.6	9.6
0-3 Nominal	14	15
3-6 Nominal	15.6	13.6
6-12	17.6	16

Characteristic	e- STI testing (N = 1031)	Usual care (N = 1032)
Nominal		
12 or more Nominal	29.2	27.5
Never Nominal	23.7	27.5
Sexual health clinic Nominal	50.5	47.9
GP Nominal	11.7	11.1
Hospital Nominal	4.9	4.2
Pharmacy Nominal	0.7	1.1
Internet service Nominal	3.1	2.7

Critical appraisal - GUT Cochrane Risk of Bias tool (RoB 2.0) Normal RCT

Section	Question	Answer
Domain 1: Bias arising from the randomisation process	1. 1. Was the allocation sequence random?	Yes
Domain 1: Bias arising from the randomisation process	1. 2. Was the allocation sequence concealed until participants were enrolled and assigned to interventions?	Yes
Domain 1: Bias arising from the randomisation process	1.3 Did baseline differences between intervention groups suggest a problem with the randomisation process?	No
Domain 1: Bias arising from the randomisation process	Risk of bias judgement for the randomisation process	Low
Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention)	2.1. Were participants aware of their assigned intervention during the trial?	Yes

Section	Question	Answer
Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention)	2.2. Were carers and people delivering the interventions aware of participants' assigned intervention during the trial?	Probably no
Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention)	2.3. If Y/PY/NI to 2.1 or 2.2: Were there deviations from the intended intervention that arose because of the experimental context?	No/Probably no
Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention)	2.4. If Y/PY to 2.3: Were these deviations from intended intervention balanced between groups?	No information
Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention)	2.5 If N/PN/NI to 2.4: Were these deviations likely to have affected the outcome?	No information
Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention)	2.6 Was an appropriate analysis used to estimate the effect of assignment to intervention?	Yes
Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention)	2.7 If N/PN/NI to 2.6: Was there potential for a substantial impact (on the result) of the failure to analyse participants in the group to which they were randomized?	No information
Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention)	Risk of bias for deviations from the intended interventions (effect of assignment to intervention)	Low
Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention)	2.1. Were participants aware of their assigned intervention during the trial?	Yes
Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention)	2.2. Were carers and people delivering the interventions aware of participants' assigned intervention during the trial?	No information
Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention)	2.3. If Y/PY/NI to 2.1 or 2.2: Were important co-interventions balanced across intervention groups?	Probably no

Section	Question	Answer
Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention)	2.4. Could failures in implementing the intervention have affected the outcome?	Probably no
Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention)	2.5. Did study participants adhere to the assigned intervention regimen?	No information
Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention)	2.6. If N/PN/NI to 2.3 or 2.5 or Y/PY/NI to 2.4: Was an appropriate analysis used to estimate the effect of adhering to the intervention?	No information
Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention)	Risk of bias judgement for deviations from the intended interventions (effect of adhering to intervention)	Low
Domain 3. Bias due to missing outcome data	3.1 Were data for this outcome available for all, or nearly all, participants randomised?	Probably yes
Domain 3. Bias due to missing outcome data	3.2 If N/PN/NI to 3.1: Is there evidence that result was not biased by missing outcome data?	Probably yes
Domain 3. Bias due to missing outcome data	3.3 If N/PN to 3.2: Could missingness in the outcome depend on its true value?	Probably no
Domain 3. Bias due to missing outcome data	3.4 If Y/PY/NI to 3.3: Do the proportions of missing outcome data differ between intervention groups?	Probably no
Domain 3. Bias due to missing outcome data	3.5 If Y/PY/NI to 3.3: Is it likely that missingness in the outcome depended on its true value?	Probably no
Domain 3. Bias due to missing outcome data	Risk-of-bias judgement for missing outcome data	Low
Domain 4. Bias in measurement of the outcome	4.1 Was the method of measuring the outcome inappropriate?	Yes
Domain 4. Bias in measurement of the outcome	4.2 Could measurement or ascertainment of the outcome have differed between intervention groups ?	No
Domain 4. Bias in measurement of the outcome	4.3 If N/PN/NI to 4.1 and 4.2: Were outcome assessors aware of the intervention received by study participants ?	No

Section	Question	Answer
Domain 4. Bias in measurement of the outcome	4.4 If Y/PY/NI to 4.3: Could assessment of the outcome have been influenced by knowledge of intervention received?	No
Domain 4. Bias in measurement of the outcome	4.5 If Y/PY/NI to 4.4: Is it likely that assessment of the outcome was influenced by knowledge of intervention received?	No information
Domain 4. Bias in measurement of the outcome	Risk-of-bias judgement for measurement of the outcome	Low
Domain 5. Bias in selection of the reported result	5.1 Was the trial analysed in accordance with a pre-specified plan that was finalised before unblinded outcome data were available for analysis ?	Yes
Domain 5. Bias in selection of the reported result	5.2 Is the numerical result being assessed likely to have been selected, on the basis of the results, from multiple outcome measurements (e.g. scales, definitions, time points) within the outcome domain?	No/Probably no
Domain 5. Bias in selection of the reported result	5.3 Is the numerical result being assessed likely to have been selected, on the basis of the results, from multiple analyses of the data?	No/Probably no
Domain 5. Bias in selection of the reported result	Risk-of-bias judgement for selection of the reported result	Low
Overall bias and Directness	Risk of bias judgement	Low
Overall bias and Directness	Overall Directness	Directly applicable

Wilson, 2019

Bibliographic Reference	Wilson, Emma; Leyrat, Clemence; Baraitser, Paula; Free, Caroline; Does internet-accessed STI (e-STI) testing increase testing uptake for chlamydia and other STIs among a young population who have never tested? Secondary analyses of data from a randomised controlled trial.; Sexually transmitted infections; 2019; vol. 95 (no. 8); 569-574

Study details

Secondary publication of another included study- see primary study for details	Secondary analysis of Wilson et al. 2017. All study details remain the same.

Xu, 2011

Bibliographic Reference	Xu F; Stoner BP; Taylor SN; Mena L; Tian LH; Papp J; Hutchins K; Martin DH; Markowitz LE; Use of home-obtained vaginal swabs to facilitate rescreening for Chlamydia trachomatis infections: two randomized controlled trials.; Obstetrics and gynecology; 2011; vol. 118 (no. 2 Pt 1)

Study details

Secondary publication of another included study- see primary study for details	
Trial registration number and/or trial name	clinicaltrials.gov, NCT 00132457
Study type	Randomised controlled trial (RCT)
Study location	USA: New Orleans, Louisiana, St Louis, Missouri, and Jackson, Mississippi
Study setting	Home or clinic
Study dates	from 2005 through 2007
Sources of funding	Centers for Disease Control and Prevention
Inclusion criteria	Age Over 16 Female Diagnosed chlamydia
Exclusion criteria	Unable to read English Unable to provide consent Pregnant Trying to conceive HIV positive Planning to move house in the near future Living outside of selected areas

	Serious illness or health issues
Intervention(s)	For women assigned to the home group, the participant's home address was confirmed, and a specimen collection kit with instructions on how to obtain a vaginal swab was mailed to the participant's home (or her preferred address). Women assigned to the home group could also elect to pick up the collection kit from the clinic. After specimen collection, participants were asked to return the specimen in a postage-paid, preaddressed mailing tube, along with the follow-up questionnaire.
Comparator	For women assigned to the clinic group, a clinic appointment was scheduled for rescreening
Outcome measures	STI Testing Behaviour rescreening within a 7-week window, defined as 1 week (7 days) before to 6 weeks (42 days) after the target date that marked 3 months after the initial treatment (day 90) STIs detected
Number of participants	STD clinic trial: 811 in total, 408 in home test group and 403 in clinic group. Family planning trial: 404 in total, 196 in home test group, 208 in clinic group.
Duration of follow-up	3 months
Loss to follow-up	n/a
Methods of analysis	We compared demographic and other relevant factors between home group and clinic group using Chi2 for categorical variables and t test for continuous variables. Rescreening rates were also compared by study site, key demographics, and behavioural factors to identify subpopulations in which rescreening rates in the home group were significantly higher. We used the Chi2 or Fisher exact test, when appropriate, to compare rescreening rates. We defined a P<.05 as statistically significant. All sample size calculations were performed with NQuery Advisor 5.0. All statistical analyses were done using SAS 9.2.

Study arms

STD clinic - home test (N = 441)
Recruited from clinic, tested at home

STD clinic - clinic appointment (N = 439)
Recruited at STD clinic, tested at booked appointment

Family planning- home test (N = 198)
Recruited at family planning clinic, tested at home

Family planning - clinic appointment (N = 214)
Recruited at family planning clinic, tested at booked appointment

Characteristics

Arm-level characteristics

Characteristic	STD clinic - home test (N = 441)	STD clinic - clinic appointment (N = 439)	Family planning- home test (N = 198)	Family planning - clinic appointment (N = 214)
Age (Mean) Nominal	22.5	22.4	21.4	21.8
African American (%) Nominal	93.1	92.1	85.2	87.5
Education beyond high school (%) Nominal	19.4	15.4	21.4	25
Full time school/work (%) Nominal	31.9	36	41.3	40.9
Living with parents (%) Nominal	40.2	36.8	50.5	48.6

Critical appraisal - GUT Cochrane Risk of Bias tool (RoB 2.0) Normal RCT

Section	Question	Answer
Domain 1: Bias arising from the randomisation process	1. 1. Was the allocation sequence random?	Yes
Domain 1: Bias arising from the randomisation process	1. 2. Was the allocation sequence concealed until participants were enrolled and assigned to interventions?	Yes
Domain 1: Bias arising from the randomisation process	1.3 Did baseline differences between intervention groups suggest a problem with the randomisation process?	Probably no
Domain 1: Bias arising from the randomisation process	Risk of bias judgement for the randomisation process	Low
Domain 2a: Risk of bias due to deviations from the intended interventions	2.1. Were participants aware of their assigned intervention during the trial?	Yes

Section	Question	Answer
(effect of assignment to intervention)		
Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention)	2.2. Were carers and people delivering the interventions aware of participants' assigned intervention during the trial?	Yes
Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention)	2.3. If Y/PY/NI to 2.1 or 2.2: Were there deviations from the intended intervention that arose because of the experimental context?	No/Probably no
Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention)	2.4. If Y/PY to 2.3: Were these deviations from intended intervention balanced between groups?	No information
Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention)	2.5 If N/PN/NI to 2.4: Were these deviations likely to have affected the outcome?	No information
Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention)	2.6 Was an appropriate analysis used to estimate the effect of assignment to intervention?	Yes
Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention)	2.7 If N/PN/NI to 2.6: Was there potential for a substantial impact (on the result) of the failure to analyse participants in the group to which they were randomized?	No information
Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention)	Risk of bias for deviations from the intended interventions (effect of assignment to intervention)	Low
Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention)	2.1. Were participants aware of their assigned intervention during the trial?	Yes

Section	Question	Answer
Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention)	2.2. Were carers and people delivering the interventions aware of participants' assigned intervention during the trial?	Yes
Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention)	2.3. If Y/PY/NI to 2.1 or 2.2: Were important co-interventions balanced across intervention groups?	No information
Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention)	2.4. Could failures in implementing the intervention have affected the outcome?	Probably yes
Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention)	2.5. Did study participants adhere to the assigned intervention regimen?	No information
Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention)	2.6. If N/PN/NI to 2.3 or 2.5 or Y/PY/NI to 2.4: Was an appropriate analysis used to estimate the effect of adhering to the intervention?	Not applicable
Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention)	Risk of bias judgement for deviations from the intended interventions (effect of adhering to intervention)	Some concerns
Domain 3. Bias due to missing outcome data	3.1 Were data for this outcome available for all, or nearly all, participants randomised?	Probably yes *(Participants withdrew due to hurricane Katrina)*
Domain 3. Bias due to missing outcome data	3.2 If N/PN/NI to 3.1: Is there evidence that result was not biased by missing outcome data?	Yes
Domain 3. Bias due to missing outcome data	3.3 If N/PN to 3.2: Could missingness in the outcome depend on its true value?	No
Domain 3. Bias due to missing outcome data	3.4 If Y/PY/NI to 3.3: Do the proportions of missing outcome data differ between intervention groups?	No

Section	Question	Answer
Domain 3. Bias due to missing outcome data	3.5 If Y/PY/NI to 3.3: Is it likely that missingness in the outcome depended on its true value?	No
Domain 3. Bias due to missing outcome data	Risk-of-bias judgement for missing outcome data	Low
Domain 4. Bias in measurement of the outcome	4.1 Was the method of measuring the outcome inappropriate?	Yes
Domain 4. Bias in measurement of the outcome	4.2 Could measurement or ascertainment of the outcome have differed between intervention groups ?	No
Domain 4. Bias in measurement of the outcome	4.3 If N/PN/NI to 4.1 and 4.2: Were outcome assessors aware of the intervention received by study participants ?	Yes
Domain 4. Bias in measurement of the outcome	4.4 If Y/PY/NI to 4.3: Could assessment of the outcome have been influenced by knowledge of intervention received?	No
Domain 4. Bias in measurement of the outcome	4.5 If Y/PY/NI to 4.4: Is it likely that assessment of the outcome was influenced by knowledge of intervention received?	No
Domain 4. Bias in measurement of the outcome	Risk-of-bias judgement for measurement of the outcome	Low
Domain 5. Bias in selection of the reported result	5.1 Was the trial analysed in accordance with a pre-specified plan that was finalised before unblinded outcome data were available for analysis ?	Yes
Domain 5. Bias in selection of the reported result	5.2 Is the numerical result being assessed likely to have been selected, on the basis of the results, from multiple outcome measurements (e.g. scales, definitions, time points) within the outcome domain?	No/Probably no
Domain 5. Bias in selection of the reported result	5.3 Is the numerical result being assessed likely to have been selected, on the basis of the results, from multiple analyses of the data?	No/Probably no
Domain 5. Bias in selection of the reported result	Risk-of-bias judgement for selection of the reported result	Low

Section	Question	Answer
Overall bias and Directness	Risk of bias judgement	Low
Overall bias and Directness	Overall Directness	Partially applicable

D.2 Qualitative evidence

Aicken, 2016

Bibliographic Reference	Aicken, Catherine R H; Fuller, Sebastian S; Sutcliffe, Lorna J; Estcourt, Claudia S; Gkatzidou, Voula; Oakeshott, Pippa; Hone, Kate; Sadiq, S Tariq; Sonnenberg, Pam; Shahmanesh, Maryam; Young people's perceptions of smartphone-enabled self-testing and online care for sexually transmitted infections: qualitative interview study.; BMC public health; 2016; vol. 16; 974

Study Characteristics

Study type	In depth interviews
Aim of study	To explore perceptions and acceptability of remote STI self-testing and associated online care pathways to treatment (a hypothetical intervention), among young people from an Inner-London locality with high rates of STIs and large populations of Black Caribbean and African ethnic origin
Theoretical approach	None stated
Study location	London, UK
Study setting	an Inner-London Further Education (FE) college
Study dates	Spring/Summer 2012
Sources of funding	The Electronic Self-Testing Instruments for Sexually Transmitted Infection Control (eSTI2) Consortium is funded under the UKCRC Translational Infection Research (TIR) Initiative supported by the Medical Research Council (Grant Number G0901608) with contributions to the Grant from the Biotechnology and Biological Sciences Research Council, the National Institute for Health Research on behalf of the Department of Health, the Chief Scientist Office of the Scottish Government Health Directorates and the Wellcome Trust
Data collection	Interviews took place in private rooms at college sites. One male interviewer (SF) conducted and audio recorded all interviews. The topic guide, described briefly here, had been piloted, and was used flexibly and revised iteratively between interviews. The interviewer began by asking about participants' experience with smartphone technology, internet-use in relation to health, and STI testing. First impressions of 'testing for STIs using your smartphone' were explored. Then, participants were provided with a brief description of the proposed testing device and associated online care pathway, aided by an animation (Additional file 1) which outlined stages a user would potentially go through (operating the self testing device with a sample of urine or vaginal swab, receiving their result, and if positive, an online consultation, 'e-prescription', partner notification and sexual health advice). The interviewer explained that the test was still being developed, but that the animation showed what it might be like. Few details were provided about the test and online care pathway, for simplicity, and because of uncertainties at this stage in intervention development. The interviewer

	explained that obtaining treatment this way would be safe for most people (but not what would happen otherwise). Scenarios were used to explore acceptability and preferences of various stages, from self-testing, through to receipt of treatment for those testing positive (Additional file 2). Participants were asked for their understanding of 'confidentiality'. Interviews explored acceptability of providing personal details, sexual history, and medical information to verify treatment safety, using their smartphone. Participants were asked if they would use the service described and why (not). The interviewer, mindful of his somewhat older age, status as a university researcher, association with novel technology, and the implications of these for social desirability bias in the views participants might express, sought to lessen the social distance between himself and participants by mirroring participants' language use, and emphasised that he was not developing the intervention and so would not be offended if they did not like or agree with some or all of the proposed format. The interviewer kept field-notes, recording circumstances of recruitment and impressions from interviews. Interviews lasted 29–75 min (mean: 53mins). Each participant received £15 in recognition of their time and contribution to the study. Interviews focused on exploring novel aspects of the proposed intervention; aspects that are established as broadly acceptable or have become common practice (e.g. self-sampling [36], receipt of STI test results by text-message) were not explored. Details unknown at the time of the interviews were also not explored unless mentioned by interviewees (including: which infections the device would detect – described by the interviewer as chlamydia in the first instance 'because it is an easier infection to treat', specific clinical and disease surveillance information to be collected, cost, distribution, and whether the device would be for single or repeat use). These are being explored in ongoing research.
Method and process of analysis	thematic analysis [37] was conducted by CA, using NVivo software and paper charts. For data familiarisation, transcripts were read repeatedly, alongside listening to recordings and reading field-notes. A mixed inductive deductive approach was used: identification of themes was influenced by emergent and recurring issues in the data, and by a priori issues relating to study aims. Individuals' accounts of their views and experiences with existing STI testing services, and with smartphones and the internet, were used to contextualise their views on the novel service. Analysis took place after data collection was complete, meaning that initial findings could not be explored in subsequent interviews. SF and MS, who were familiar with the entire dataset, provided detailed feedback on CA's draft analysis, for verification of findings. Participants' comments were not sought on either the transcripts or study findings. This was impractical because of the end of the college's academic year and study timelines. We also had concerns for participants' privacy if we contacted them about the study, given the eligibility criteria and sensitive content of the interviews
Population and sample collection	A purposive sampling strategy [35] was used, with gender and age-group as primary sampling criteria, and a target of 24–36 interviews. We used the age-groups 16– 19 and 20–24 because experience with sex, and with sexual healthcare and healthcare in general, are likely to increase with increasing age.

	Interviewees were aged 16–23 years (mean 19 years). The quota of 6–8 participants in each sex/age group category was not filled for older females (n = 2 participants) prior to the end of the college term. Participants' accounts of their STI testing experience ranged from a single chlamydia screen, to repeated comprehensive testing in sexual health clinics. Use of STI testing in general practice and use of internet-ordered home-sampling for chlamydia were also reported.
Inclusion Criteria	Age: 16–24 Have had sex at least once Attends FE college Location: London
Relevant themes	1. Perceptions of self-testing with online care pathways, in relation to barriers to use of existing sexual healthcare: 1. Making access to STI testing quicker, easier and more convenient: Participants described smartphone-enabled self-testing and online care pathways as making access to STI testing and treatment easier and more convenient than existing services. "It's… convenient, very convenient. That's why I like it" 2. 'Faceless' sexual healthcare: Self-testing and providing information 'facelessly' online was advantageous "I would rather that 'cause there's not no one in front of me like talking to me or looking at me…" 3. Concealing use of sexual healthcare: Participants welcomed the perceived greater ability they would have to conceal their STI testing by using a self-test, although there were concerns about the test device itself being concealable "youth nowadays, yeah, we always have each other's phones" 2. Further perceptions about remote self-testing with online care: 1. Speed of testing: Trade-offs exist between speed and privacy, and between speed and perceived accuracy "everything is fast now" 2. Self-testing with new technology versus professionals testing using established technology: Two main sources of doubt were identified: the novel technology and self-operation "…this is still new. It has still little kinks to be found, little things to be found. Whereas the clinic is established" 3. Personal support from healthcare professionals: There was a tension between participants' preferences for avoiding clinical contact when accessing testing, and a desire, expressed by some, for contact with a healthcare professional if a positive result were received "I see it as, if it's something on your phone you don't really wanna read so much. But if you can talk to someone, not a computer, someone real, then you're most likely to listen."

	4. Legitimacy and credibility. A basis in the NHS and association with medical professionals enhanced the perceived legitimacy "That it's part of the NHS? It makes me feel safe" 5. Confidentiality, data security and trust: The confidential but not anonymous nature of the service was accepted with varying degrees of reluctance. 6. Concealing evidence of an STI: they discussed how not only the results message, but an 'e-prescription' and other messages could reveal their STI status, if seen by others. "I live with my parents. Then, my mum sometimes likes to open my letters"

Critical appraisal - CASP qualitative checklist

Section	Question	Answer
Aims of the research	Was there a clear statement of the aims of the research?	Yes
Appropriateness of methodology	Is a qualitative methodology appropriate?	Yes
Research Design	Was the research design appropriate to address the aims of the research?	Yes
Recruitment Strategy	Was the recruitment strategy appropriate to the aims of the research?	Yes
Data collection	Was the data collected in a way that addressed the research issue?	No *(Data was collected prior to the intervention, so views were hypothetical.)*
Researcher and participant relationship	Has the relationship between researcher and participants been adequately considered?	Yes
Ethical Issues	Have ethical issues been taken into consideration?	Yes
Data analysis	Was the data analysis sufficiently rigorous?	Yes
Findings	Is there a clear statement of findings?	Yes
Research value	How valuable is the research?	The research has some value
Overall risk of bias and relevance	Overall risk of bias	Low

Section	Question	Answer
Overall risk of bias and relevance	Relevance	Relevant *(Downgraded due to the intervention being hypothetical)*

Estcourt, 2016

Bibliographic Reference	Estcourt, Claudia; Sutcliffe, Lorna; Mercer, Catherine H; Copas, Andrew; Saunders, John; Roberts, Tracy E; Fuller, Sebastian S; Jackson, Louise J; Sutton, Andrew John; White, Peter J; Birger, Ruthie; Rait, Greta; Johnson, Anne; Hart, Graham; Muniina, Pamela; Cassell, Jackie; No title provided; 2016

Study Characteristics

Study type	Semi structured interviews Interviews
Aim of study	• To develop, through qualitative research and consumer and stakeholder consultation, two feasible and replicable interventions for delivering STI screening in football club venues. • To determine the acceptability to young men and the feasibility of football trainer-led STI and HIV screening.
Theoretical approach	Popular opinion leader theory
Study location	Greater London, UK
Study setting	Telephone interviews and various locations.
Study dates	between October and December 2011 for naïve group, and 2 weeks after the intervention for RCT group.
Sources of funding	Programme Grants for Applied Research: The research reported in this issue of the journal was funded by PGfAR as project number RP-PG-0707-10208. This report presents independent research funded by the National Institute for Health Research (NIHR)
Data collection	Naïve participant group: An interview topic guide was developed by the research team. A single researcher conducted all interviews. Interviews started with general questions about the participant and his involvement with the football club. This was to allow the rest of the interview to be seen in the context of the participant's age, background and reasons for playing team football. These initial questions were also considered fairly unthreatening and helped to create a rapport between the researcher and the participants before moving onto potentially more sensitive questions about attitudes to sexual health and testing for chlamydia. Participants were then asked about attitudes to general health promotion within the football club setting as an opportunity to draw out general thoughts and ideas about health promotion in football clubs before asking specifically about sexual health promotion. It gave an overview of how health was viewed by men and challenged apparent contradictions in attitudes to sexual health compared with general health. The topic guide then became more structured and asked about attitudes to the proposed models of chlamydia testing (coach led, health professional led, poster led). To enable them to have a preference about a new way of testing, it was important for men to have an understanding about what traditional options for testing looked like. This would allow men to compare and contrast the proposed

	models with standard testing in traditional settings. Without this it would be difficult for men who had a low baseline knowledge of STI testing to appropriately assess the potential advantages and disadvantages of testing in football clubs. Therefore, a traditional testing pathway involving visiting a clinic for urine testing was described to participants before they were asked about novel models of delivering testing opportunities. Subsequent pathways then showed coach-led, health professional-led and poster-led promotion in football clubs. Participants were interviewed only once over a period of between 40 and 70 minutes. Interviews were digitally recorded to ensure accurate documentation of what was said and to allow the researcher to concentrate on participant responses. Recordings were transcribed verbatim with participant-identifying information removed. Some brief field notes were made following the interviews to help contextualise the interviews. Questions were open-ended with further, more directive questioning used to explore the reasons behind attitudes and statements. Participants were interviewed only once over a period of between 40 and 70 minutes. Interviews were digitally recorded to ensure accurate documentation of what was said and to allow the researcher to concentrate on participant responses. Recordings were transcribed verbatim with participant-identifying information removed. Some brief field notes were made following the interviews to help contextualise the interviews. Questions were open-ended with further, more directive questioning used to explore the reasons behind attitudes and statements. RCT group: Individual semistructured telephone interviews were conducted with the players who had consented. The interviews varied slightly according to whether the participant was a player or a captain of a football team; however, all interviews explored the players' basic demographic characteristics, their views and experiences of the process of the intervention they had received (or gave if the participant was a captain) at their club, their thoughts of having STI testing sample collection kits available at the football club, their views of the contents and use of the kits, whether or not they had previously tested for a STI, their experiences of testing for an STI elsewhere and their preferences for future STI testing. All interviews were audio recorded, lasted approximately 30 minutes and were conducted 4–6 weeks after the SPORTSMART intervention by a female researcher.
Method and process of analysis	Naïve group: We used a framework approach to interpretation of the data as we felt that it best suited the practical and applied nature of the research to answer questions about health service development. Although this approach is based in the original accounts and observations of the participants, and therefore 'grounded' and inductive, it uses a priori categories to analyse the data. It also allows multiple researchers to analyse transcripts simultaneously to reduce bias and reach consensus. The process consists of five main components: 1. Familiarisation. After conducting the interviews, one researcher (JS) listened to the taped recordings and read the transcripts many times to become familiar with the raw data. JS also made notes in the margins of transcripts and in a notebook of recurring themes, ideas and thoughts about the data. 2. Identifying a thematic framework and developing a coding framework. Through this process of rereading the transcripts two researchers (JS and LS) identified and provisionally organised key and

	emergent themes based on the a priori research questions. We also developed codes based on key phrases and responses in the interviews. This process was carried out on an initial sample of four transcripts to code the transcripts line by line according to the ideas being expressed by the participant. In this way a long list of codes was created. The next step was to group together closely related codes under broader headings. These new codes were then used in the next 'indexing' stage. 3. Indexing. Two researchers (JS and LS) systematically applied these codes to the initial interviews independently of each other before comparing the coding. Discrepancies in how the codes had been applied were discussed, a consensus was agreed and alterations were made to the coding tree. These codes were then systematically applied to the remaining interviews. 4. Charting. We used Microsoft Excel® 2010 (Microsoft Corporation, Redmond, WA, USA) to chart and manage the data of specific qualitative data management software because of familiarity with the software. We developed major themes and subthemes and defined and placed key excerpts from the interviews into the charts to ensure that the findings were grounded in what the participants said, as well as to facilitate comparison of experiences and responses within and between cases. 5. Mapping and interpretation. During this stage we developed ideas and meanings behind the data through discussion, writing descriptive accounts of the findings, looking for relationships between themes and testing the findings back against the initial research questions and transcripts. RCT group: Interviews were transcribed verbatim and analysed using the framework approach.Transcripts were read and reread by four researchers and coded into broad themes based on the research objective and interview content to create an initial coding framework. This framework was further discussed and modified within the research group. Two members of the research group then systematically applied these codes to the transcripts. Reliability was enhanced by double coding and comparing a subset of transcripts. Few discrepancies emerged and, when they did, consensus was negotiated.
Population and sample collection	Naïve group: A mixture of convenience and snowball sampling was used to recruit participants. Participants were selected based on whether or not they contacted us to take part in the study (convenience sampling). RCT group: Thirteen men (10 players and three captains) agreed to participate in the follow-up interviews. Two captains and six players from two different football clubs received the poster intervention, four players from two different teams received the poster and HCP intervention and one captain from one team gave the poster and the captain-led intervention. Men were aged between 21 and 31 years and all had previously tested for a STI. Seven had tested at a specialist GUM clinic, three at university, four at their GP surgery and one at school. Eight men (one married) described themselves as in a monogamous relationship of ≥ 12 months; three men described themselves as single with no new sexual partners in the past 3 months; one man reported 'four to five' new sexual partners; and one man reported one new sexual partner during the last 3 months.
Inclusion Criteria	Age: 18-35

	Currently playing in an amateur football club Participation in quantitative study
Relevant themes	Naïve participants: 1. Characteristics of the provider of the sexual health message: Familiarity with the promoter had a mixed effect on acceptability among men. Because of the sensitive subject, some men preferred to talk about sex with people they knew, for example the coach or captain, whereas for others this may act as a barrier. "I think with a manager you'd be kind of like, unless he was reading it, you're kind of like, has he made that bit up?" 2. Characteristics of the testing pathway: , men valued processes that were quick, did not interfere with their main reasons for being at the club (to play football and socialise), fitted in around their daily activities and routines and gave them opportunities to test in a variety of settings to maintain anonymity. "you'd be taking up the players' time, 'cos that's why I keep mentioning 10 or 15 minutes, you'd have to make it concise. It couldn't be more than that I don't think. Especially if it's after training people wanna get home" 3. Characteristics of the men: STIs and being associated with them, either through being seen to test for them or having one, are recognised by participants as stigmatised behaviours. These feelings of stigma meant that men preferred testing options that kept any possibility of this to a minimum. "So I think 'cos it's in that environment I don't really think people would be embarrassed about it. They'll probably go, yeah, you know, I had this girl last week and a girl the week before and you just get a bit, a lot of egos flying about and it will create a lot of banter I think." RCT participants: 1. Delivery and content of the intervention: Some men who had experienced the poster and HCP-led intervention felt that the HCP brought some legitimacy to STI testing at football clubs, as they perceived the HCP to be more knowledgeable and better able to give advice and reassurance before and after testing for a STI. "he was very matter of fact, just came in, 'right this is what you need to do'. It wasn't a lecture or anything like that. It was very concise." 2. Poster-promoted screening: without consciously doing so, managers and captains were acting like our captain-led intervention based on the popular opinion leader theory. However, the players seemed happy with this approach. "He just told me exactly what was going on, 'the bins are in there, get everyone who wants to take part'. From my point of view, I thought it was kind of . . . well the important thing is I think the club wanted to do it so it was important thing for us." 3. Poster and captain-promoted screening: From an interview with one captain who gave the message to the players. He was very enthusiastic about STI testing being made available at the football clubs as he had previously tested for a STI at a GUM clinic and found it embarrassing and time-consuming. "if a couple of boys that did the test at football then the other boys seem to and it sort of, it's not really embarrassing really at football because you're with the boys." 4. Reasons for testing: Several of the men mentioned the inconvenience of testing at other services, including making appointments and the

	time required to attend those appointments. They explained that they had done the test in the trial because it was simple and easy to do, with easy to understand instructions. "It was a case of it was there, the opportunity was there, everybody else was doing it, so that was it really the thinking behind it" 5. Feelings about testing: the majority of them said that they were very comfortable testing with their football colleagues in an all-male sports environment. They did not feel embarrassed to be testing and despite doing a test with all of the other team members. "I would say no one was embarrassed. I guess probably the nature of the culture, so you know, it's a football club and we're all close mates. We chat about this sort of stuff all the time. Well, not about this sort of stuff, but we chat about sex and women all the time. " 6. Preferences for future testing: Overall, the men interviewed would prefer to be tested at a football club in future, because of the 'all lads together' relaxed environment. They also preferred the ease and simplicity of the tests and the convenience. "I'd probably, being a boy, I'd prefer it how I have just done it with the football team"
Additional information	This publication contains several studies. The two qualitative SPORTSMART studies are extracted together here, covering views on the intervention from a naïve participant group and from participants who took part in the RCT.

Critical appraisal - CASP qualitative checklist

Section	Question	Answer
Aims of the research	Was there a clear statement of the aims of the research?	Yes
Appropriateness of methodology	Is a qualitative methodology appropriate?	Yes
Research Design	Was the research design appropriate to address the aims of the research?	Yes
Recruitment Strategy	Was the recruitment strategy appropriate to the aims of the research?	Yes
Data collection	Was the data collected in a way that addressed the research issue?	Yes
Researcher and participant relationship	Has the relationship between researcher and participants been adequately considered?	Yes
Ethical Issues	Have ethical issues been taken into consideration?	Yes
Data analysis	Was the data analysis sufficiently rigorous?	Yes
Findings	Is there a clear statement of findings?	Yes

Section	Question	Answer
Research value	How valuable is the research?	The research is valuable
Overall risk of bias and relevance	Overall risk of bias	Low
Overall risk of bias and relevance	Relevance	Highly relevant

Fleming, 2020

Bibliographic Reference	Fleming, C.; Drennan, V.M.; Kerry-Barnard, S.; Reid, F.; Adams, E.J.; Sadiq, S.T.; Phillips, R.; Majewska, W.; Harding-Esch, E.M.; Cousins, E.C.; Yoward, F.; Oakeshott, P.; Understanding the acceptability, barriers and facilitators for chlamydia and gonorrhoea screening in technical colleges: qualitative process evaluation of the "Test n Treat" trial; BMC public health; 2020; vol. 20 (no. 1); 1212

Study Characteristics

Study type	Semi structured interviews
Aim of study	to evaluate the trial implementation, to offer explanatory theories as to the success or failure, and to inform future research and/or service provision decisions [20]. We explored the following research questions: • Is the provision of rapid chlamydia and gonorrhoea testing in technical colleges viewed as acceptable and appropriate by students? • What are the barriers and facilitators to uptake as perceived by young people, teaching staff and on-site researchers? • What factors or strategies might improve uptake of rapid chlamydia and gonorrhoea testing in technical colleges from the perspectives of young people, teaching staff and on-site researchers?
Theoretical approach	Goffman’s theory of stigma and the construct of ‘candidacy’ [
Study location	London, UK
Study setting	Technical FE colleges
Study dates	between December 2016 and March 2017
Sources of funding	This independent research is funded by the National Institute for Health Research (NIHR) under its Research for Patient Benefit (RfPB) Programme (Grant Reference Number PB-PG-1014-35007)
Data collection	Participating students in the three intervention colleges were texted invitations to on-site STI testing (TnT) one and four months after recruitment. Testing activities were undertaken in private rooms. Participants at all six colleges were texted invitations to attend the seven months follow up. CF, a female health researcher, undertook these interviews between December 2016 and March 2017. In addition, CF interviewed the main TnT contact member of staff from these three colleges. These were staff who were supportive of the idea of providing such services within the college setting. VMD, a female health researcher, interviewed the four researchers who did the fieldwork (SKB, CF, EC and WM) and used reflective techniques in the interview for checking understanding and interpretation [24]. Interviews took place either in a private room at college or over the phone at a time that was convenient for the participant. Written informed consent for interviews was obtained at recruitment, and then oral consent was provided at the time of interview. Interviews lasted between 5 and 28 min, were digitally recorded

	with permission and backed with field notes. Recordings were transcribed, anonymised and then destroyed.
Method and process of analysis	Transcripts were read, re-read, coded and analysed using thematic analysis [25]. The analysis was informed by the study topic guide and the initial theoretical framing of the study. Data were coded line by line and then clustered manually to identify categories based on issues and themes. Data were then grouped in main analytic themes. Where data did not fit into existing themes, new ones were developed or existing ones modified until all data were grouped by theme by CF and VMD, resolving differences through discussion [25]. The analysis was further refined in discussion with the wider research team. Trustworthiness and credibility of the analysis were explored in meetings that included student representatives, and no further themes were identified. Reporting conforms to Standards for Reporting Qualitative Research [26] and the checklist is provided in additional file 2.
Population and sample collection	For the main TnT trial, 509 sexually active students aged 16–24 years were recruited from public areas at six colleges [17] (Fig. 1). Three colleges were then randomly assigned to receive the intervention, and the process evaluation was undertaken with participants in these colleges. All participants were aged over 16 years. For the qualitative process evaluation in the three intervention colleges, a purposive sample [24] of male and female students across the age range of 16–24 years and ethnic backgrounds, were approached by text/telephone to volunteer to be interviewed after month one and four (Fig. 1). The sample included both those who had and also had not attended for screening. Participants were recruited until no new themes were identified Interviews were carried out with 26 students: 13 TnT non-attenders and 13 TnT attenders for testing. Two further students who had agreed to be interviewed did not attend or respond to subsequent texts and calls. The mean age of respondents was 17.5 years, 62% were female, 50% described their ethnic group as Black. Most participants (92%, 2224) who responded to the question said they were heterosexual
Inclusion Criteria	Age: 16-24 Sexually active

Relevant themes	1. Student perceptions of the acceptability or otherwise of on-site STI testing: The TnT study itself was viewed very positively by most of the students interviewed (n = 25/26). Attenders thought the service was ‘amazing’ (interviewee 220), ‘educational’ (interviewee 117), ‘friendly’ (interviewee 429), and ‘helpful’ (interviewee 131)
	2. Perceived barriers to uptake of the on-site STI testing. "they feel like if they go and get done [tested], people will talk and judge him or her"
	    1. Embarrassment and perceived stigma
	    2. The influence of peers
	    3. Lack of knowledge of STIs
	    4. The potential for surveillance
	    5. Perceptions of invulnerability to STIs

	3. Perceived facilitators for uptake of on-site STI testing. “One of my mates said you might as well do it. I was like, OK, I might as well see as well. So that’s why I did it.” 1. Knowledge of the personal risk of STIs 2. The influence of peers in facilitating STI testing 3. The non-medical setting for STI testing as a facilitator 4. The role of incentives as facilitating STI testing 4. Views on future strategies to increase the uptake of STI testing in research like TnT. “Try and get out there a bit more, like I would hold like a presentation maybe" 1. Education to accompany testing 2. Publicity and reminder practicalities 3. The use of incentives
Additional information	Quantitative study was not included due to no adequate control data.

Critical appraisal - CASP qualitative checklist

Section	Question	Answer
Aims of the research	Was there a clear statement of the aims of the research?	Yes
Appropriateness of methodology	Is a qualitative methodology appropriate?	Yes
Research Design	Was the research design appropriate to address the aims of the research?	Yes
Recruitment Strategy	Was the recruitment strategy appropriate to the aims of the research?	Yes
Data collection	Was the data collected in a way that addressed the research issue?	Yes
Researcher and participant relationship	Has the relationship between researcher and participants been adequately considered?	Yes
Ethical Issues	Have ethical issues been taken into consideration?	Yes
Data analysis	Was the data analysis sufficiently rigorous?	Yes
Findings	Is there a clear statement of findings?	Yes
Research value	How valuable is the research?	The research is valuable
Overall risk of bias and relevance	Overall risk of bias	Low
Overall risk of bias and relevance	Relevance	Highly relevant

Fuller, 2019

Bibliographic Reference	Fuller, Sebastian S; Pacho, Agata; Broad, Claire E; Nori, Achyuta V; Harding-Esch, Emma M; Sadiq, Syed Tariq; "It's not a time spent issue, it's a 'what have you spent your time doing?' issue..." A qualitative study of UK patient opinions and expectations for implementation of Point of Care Tests for sexually transmitted infections and antimicrobial resistance.; PloS one; 2019; vol. 14 (no. 4); e0215380

Study Characteristics

Study type	Semi structured interviews
Aim of study	Inferred aim to provide this: there is less knowledge of patient perspectives on how implementation of these technologies may change patient care [20], and no published research on patient perspectives for implementing AMR POCTs in SHCs.
Theoretical approach	None stated
Study location	London, Devon, Yorkshire, and Eastern Scotland, UK
Study setting	sexual health clinics
Study dates	June 2015 –February 2016 and February 2017-August 2017
Sources of funding	This report is independent research funded as part of the National Institute for Health Research (NIHR) (https://www.nihr.ac.uk/) Invention for Innovation grant: A Point of Care Antimicrobial Resistance test for Neisseria gonorrhoeae and Mycoplasma genitalium infection. Ensuring accurate therapy and antibiotic stewardship in sexual health medicine. Reference: II-LB-0214-20005, awarded to STS. St George's University of London Applied Diagnostic Research and Evaluation Unit (ADREU) acknowledges the support of the National Institute of Health Research Clinical Research Network (NIHR CRN).
Data collection	In the patients interviews, participants were told by the interviewer that the design of the tests, specifically which infections were bundled onto each test cartridge, and if the NAATPOCT included AMR as well as infection detection, would influence how much time they might spend in clinic to wait for results, and if needed, treatment. It was explained that 'reflex testing', or testing for alternate causes of infections in those patient that were found to be negative in their first test would result in waiting for an additional 30 minutes or longer at clinic (e.g. those negative for CT/NG might then receive a test for TV and/or MG). Reflex testing might also be necessary if AMR was not included within an infection detection test, which would mean that patients found positive for NG or MG infection would need to wait an extra 30 minutes for the result of an AMR POCT test to guide their treatment. Patients were initially screened by a healthcare professional for eligibility and then approached by a clinic-based researcher at the time of their clinic attendance with an invitation to participate in an interview
Method and process of analysis	Interviews were audio recorded and transcribed verbatim. Transcripts were then checked for accuracy (cleaned) against the audio recording by the interviewers (SF, AP). A content analysis approach was used to capture and uncover substantive meanings within the dataset. Data were analysed using a

	thematic approach. SF and AP looked for common themes across the dataset. Transcripts were coded thematically in NVivo 11. Framework was used as a tool to organise themes, as this approach allows for reading themes across and within cases, giving opportunity for both in-depth case study analysis and explanatory analyses based on comparison of themes across the dataset [24]. SF led the analysis and selected initial themes, AP then reviewed the entire dataset and generated and assigned themes independently to transcripts to improve reliability
Population and sample collection	All participants invited into the Precise social science study were patients of participating NHS SHCs who reported symptoms of bacterial STI infection and so were at high risk for infection. A total of 148 patients agreed to be contacted by the research team for an interview, of which 63 patients (42.6%) completed an interview. Two interviews were unusable due to recording errors. Of 61 useable patient interviews, 18 women reporting sex with men, 17 men who reported exclusively heterosexual behaviour and 26 men reporting sex with men, participated. The mean age for heterosexual male participants was 25 (range 17–37), for men reporting sex with men was 30 (range 19–40), and for female participants was 28 years (range 20–41). No patients aged 16 years or between 42–45 years of age participated. The majority of participants (50/61) were White, almost one-third (27.9%; 17/61) of participants were students (n = 9 London, n = 4 Yorkshire, n = 2 Devon, n = 2 Scotland), and four were unemployed and not in education. F
Relevant themes	1. Initial impressions: Most participants were enthusiastic about the potential to receive diagnosis and treatment within one clinic visit. "Well I'd be happy with that, because I mean you'd be in and out quickly" 2. Turn-around-time and willingness to wait for results: Participants were mixed in their response to wait an additional 30 minutes for reflex testing, with many questioning why all infections and AMR were not able to be included on a single cartridge. "I think it all comes from gauging how much at risk I am at the time as to how much amount of time that I'm willing to put into getting tested and getting it sorted" 3. 'Experienced' and 'less-experienced' patient views: 'Experienced patients' often built expectations of sexual health services and opinions of the POCTs based on experiences with previous medical visit. "But then would that half-an-hour be half-an-hour if there's if there's a load of people waiting? . . .will everyone get half-an-hour treatment?" 4. Recommendations for implementation: Participants frequently expressed their desire for information about steps involved in point of care testing, estimations of duration of clinic visits being available prior to attending and the rationale behind AMR testing. "". . . I think as long as you understand the process and why this is happening, then, yes, I would have no issue with that whatsoever."

Critical appraisal - CASP qualitative checklist

Section	Question	Answer
Aims of the research	Was there a clear statement of the aims of the research?	No
Appropriateness of methodology	Is a qualitative methodology appropriate?	Yes
Research Design	Was the research design appropriate to address the aims of the research?	Yes
Recruitment Strategy	Was the recruitment strategy appropriate to the aims of the research?	No *(Also interviewed clinicians but not fully reported.)*
Data collection	Was the data collected in a way that addressed the research issue?	Yes
Researcher and participant relationship	Has the relationship between researcher and participants been adequately considered?	Yes
Ethical Issues	Have ethical issues been taken into consideration?	Yes
Data analysis	Was the data analysis sufficiently rigorous?	Yes
Findings	Is there a clear statement of findings?	No *(No summary in the discussion. Themes and subthemes are not clear and do not cover the 'respondent driven themes' Nvivo list provided.)*
Research value	How valuable is the research?	*Valauble*
Overall risk of bias and relevance	Overall risk of bias	High
Overall risk of bias and relevance	Relevance	Partially relevant *(Sample are people already using testing services.)*

Gkatzidou, 2015

Bibliographic Reference	Gkatzidou, Voula; Hone, Kate; Sutcliffe, Lorna; Gibbs, Jo; Sadiq, Syed Tariq; Szczepura, Ala; Sonnenberg, Pam; Estcourt, Claudia; User interface design for mobile-based sexual health interventions for young people: design recommendations from a qualitative study on an online Chlamydia clinical care pathway.; BMC medical informatics and decision making; 2015; vol. 15; 72

Study Characteristics

Study type	Focus Groups
Aim of study	to identify users' functional and non-functional user interface design requirements and propose design recommendations applicable to mobile sexual health application user interface design.
Theoretical approach	None stated
Study location	London and North East of England, UK
Study setting	Higher Education (HE) Institution in London and a Further Education (FE) College in an economically disadvantaged area in the North East of England
Study dates	in 2013
Sources of funding	Funded under the UKCRC Translational Infection Research (TIR) Initiative supported by the Medical Research Council (Grant Number G0901608) with contributions to the Grant from the Biotechnology and Biological Sciences Research Council, the National Institute for Health Research on behalf of the Department of Health, the Chief Scientist Office of the Scottish Government Health Directorates and the Wellcome Trust
Data collection	Focus groups were conducted in 2013 with samples from two groups of mobile phone users: 16–18 and 19–24 year olds; age groups which are representative of potential users with the highest risk of STI infection. Discussions where conducted in a private room at the FE/HE college campus, lasted for 45–60 minutes and were audio recorded and facilitated by the lead researcher. Participants had the option to select participation in same sex or mixed-sex group discussions. A semi-structured topic guide was used to promote discussion of the content and functionality of the application (Additional file 2). This covered the feasibility, acceptability, and attractiveness of potential features of the mobile application being proposed as well as visual design, information architecture, structure organisation, labelling of visual components, finding and managing options and interaction design. A low fidelity prototype of the sexual health application was developed through an iterative and cross-disciplinary reviewing process, exploring design possibilities for message content, modality and delivery platform in order to provide a prompt for discussions. This was also informed by a preliminary qualitative interview study to explore young people's perceptions of the concept of using electronic self-tests for STIs linked to mobile technology for diagnosis and care. The focus group facilitator demonstrated the prototype application on a laptop screen. In addition, an animation of the underlying clinical pathway (visual

	probe) of the system was developed using Prezi (Fig. 4). The aim of the visual probe was to ensure that all participants, regardless of previous experience with face-to-face STI testing and consultation, would understand the main steps involved in the process. The animation of the underlying clinical pathway Fig. 2) was used at the beginning of the focus group sessions to set the context of the discussion and engage the participants. The prototype (Fig. 1) was also presented early in the session to engage young people in discussions about their views in regard to the interface, how the information is presented and the ordering of interaction steps. Participants were asked to imagine providing a urine sample at home, undergoing a self-test, similar to a pregnancy test but in which the results are only available on their mobile phone. The eSTI2 mobile app was presented to users on– screen and they were asked to interact with a number of use case scenarios. Scenarios describe a sequence of actions users will try to do when they use a system, ensuring that design will remain focused on the needs and concerns of users
Method and process of analysis	Audio recordings of the discussions were transcribed verbatim and thematic analysis of the textual dataset was carried out by two members of the research team. Given the exploratory nature of the work, coding was conducted inductively rather than being driven by a priori themes from the literature, [27]. This particular method has been widely applied within the context of HCI, to inform the design of new technology interfaces [35, 36], identify key interaction challenges by analyzing users experiences with technology prototypes, [37] and define the functionality of new technology [38]. The 'Framework' approach was used [39] to analyse the data, where data from transcripts s coded, indexed and charted systematically and analysis is conducted deductively from the study aims and objectives, but is also inductive (reflecting the original account and observations of the people studied). Key issues, concepts and themes are identified by drawing on a priori issues and questions derived from the topic guide as well as issues raised by the respondents themselves and views and experiences that recur in the data. Themes were identified which integrated substantial sets of the codings, mapped and interpreted. The author and a co-author (KH) undertook the analysis and reliability was enhanced by double coding and comparing a subset of transcripts with other two co-authors (JG, LS). Few discrepancies emerged and, where they did, consensus was negotiated. Qualitative data analysis software (QSR NVIVO 10) was used to frame key topics and code the overarching themes that existed within the transcripts at a high level. These were noted in a coding frame with each concept assigned a code name, description and examples of text that fit each concept. The next step of the analysis involved identifying a list of high-priority themes and sub-themes against which design recommendations could then be formulated. This was achieved through a group discussion and consensus building process (VG, KH), which provides a method for synthesising a range of information [40] whilst harnessing the insights of multi-disciplinary researchers involved in the project.
Population and sample collection	In both settings, participants were recruited using convenience sampling methods. In the HE setting, the opportunity to take part in the research study was advertised through the internal website, and participants who met the inclusion criteria were sent further information about the study via e-mail. In the FE setting the researchers contacted the staff at the college and agreed on the method for approaching the participants where college staff invited students to participate in the study. College staff would organise and arrange the discussions for the participants who met the inclusion criteria.

	Overall, 49 participants (n =49) took part in in nine focus group discussions- three female-only, two male only, and four mixed sex groups (Table 1). Median age of participants was 19 years, 29/49 (53 %) were female and 32/49 (65 %) were of white ethnicity. Participants were recruited from a Higher Education Institution (49 %) in London and a Further Education College in the North East of England (51 %).
Inclusion Criteria	Age: 16-24 Owns a smartphone
Relevant themes	1. Theme 1: Privacy and security: Participants were primarily concerned with their 'social' privacy when using the application rather than 'institutional' privacy, expressing concerns about controlling access to personal information on their phone itself, particularly by friends and family. "I wouldn't want my sister, or my mum or my dad finding an app on my phone that says sexual" 2. Theme 2: Credibility & Legitimacy: Concerns were raised over the credibility of the overall service, especially in relation to the provision of electronic prescription and the legitimacy of medical content. "How do I know that this medication that they are prescribing me is the right one… and WHO is this person prescribing me?'" 3. Theme 3: User journey support: the consensus was that further support is required to aid and guide the user through a novel mobile based health intervention. "...wouldn't have an issue of calling up and asking for help if I had any questions, but not if it is like a call centre" 4. Theme Four: Task-technology-context fit: While participants agreed they would access the service on a mobile device, they were also prepared to adopt a flexible and fluid approach towards accessing the service on other platforms. "'I prefer web apps…I don't like to download apps as it clogs up my phone"

Critical appraisal - CASP qualitative checklist

Section	Question	Answer
Aims of the research	Was there a clear statement of the aims of the research?	Can't tell *(Aims were inferred but not clearly stated.)*
Appropriateness of methodology	Is a qualitative methodology appropriate?	Yes
Research Design	Was the research design appropriate to address the aims of the research?	Yes
Recruitment Strategy	Was the recruitment strategy appropriate to the aims of the research?	Yes

Section	Question	Answer
Data collection	Was the data collected in a way that addressed the research issue?	Yes
Researcher and participant relationship	Has the relationship between researcher and participants been adequately considered?	No
Ethical Issues	Have ethical issues been taken into consideration?	Yes
Data analysis	Was the data analysis sufficiently rigorous?	Yes
Findings	Is there a clear statement of findings?	Yes
Research value	How valuable is the research?	The research is valuable
Overall risk of bias and relevance	Overall risk of bias	Moderate
Overall risk of bias and relevance	Relevance	Relevant *(Downgraded due to not reflecting real experiences of testing)*

Hogan, 2010

Bibliographic Reference	Hogan, Angela H; Howell-Jones, Rebecca S; Pottinger, Elizabeth; Wallace, Louise M; McNulty, Cliodna Am; "...they should be offering it": a qualitative study to investigate young peoples' attitudes towards chlamydia screening in GP surgeries.; BMC public health; 2010; vol. 10; 616

Study Characteristics

Study type	Semi structured interviews
Aim of study	• Determine young people’s opinion of being offered a chlamydia screen at their GP surgery and to determine whether these differ in GP surgeries with high and low screening rates. • Identify what provisions are needed within GP surgeries to optimise the quality and effectiveness of delivery of the NCSP
Theoretical approach	Theory of Planned Behaviour
Study location	London, Wirral and Middlesex, UK
Study setting	GP surgeries
Study dates	2007-2008
Sources of funding	the Health Protection Agency
Data collection	The interview questions were developed, based on previous research with chlamydia screening co-ordinators and GP surgery staff [7,9,10] and informed by constructs of the Theory of Planned Behaviour (TPB). Interviews were semi-structured and followed broad topic areas within a TPB framework but encouraged respondents to discuss their perceptions and experiences freely. The broad areas to be discussed included: issues relating to the interviewees’ motivation for screening (attitudes), perceived staff and friends’ attitudes (subjective norms), perceived barriers to screening and service access both generally and in the GP surgery (PBC), and more general issues such as surgery ambiance, layout, setting and their views on the advantages of using their surgery rather than other sexual health services. In addition, a number of categorical questions were asked to identify participant’s previous exposure to the NCSP and to determine the intention of participants screening behaviour. The acceptability and feasibility of potential strategies to increase chlamydia screening in surgeries that had been raised in our previous research with healthcare professionals were explored, including having kits available in the reception area/toilet to take home. Participants were asked to identify factors that may make it easier for a young person to have a chlamydia screen at a GP surgery. In our previous research GP surgery staff were very positive about chlamydia screening kits being available in the reception or the toilets

	[11]. However, whilst surgeries which use this method of screening have a high turnover of kits, the return rate nationally is low [13]. To understand the barriers preventing young people returning the kits, the participants were asked their opinions on the low return rate. Participants were not asked about their sexual activity or sexual health. The interview schedule was developed to be used as a guide and the respondents were allowed to lead the interviews. The interviews took 20-40 minutes depending on their level of engagement, some of our respondents answers covered several questions at once and the interview was adjusted accordingly
Method and process of analysis	All interviews were audio-recorded and transcribed verbatim, then read and checked for accuracy by the qualitative researcher. Data were analysed using Thematic Analysis [14]. After identifying themes, the coding frame was determined using all of the data. The analysis was undertaken by researchers independent of the interviewers. All text was read and re-read before identifying initial themes, noting common themes, and documenting both insights and unforeseen topics. Themes were refined as redundant or infrequent codes were removed or recoded. The themes were then examined in relation to the central topic of concern: the influences on the motivation and behaviour of young people to be screened. We also examined the differing responses of individuals by gender, age, previous experience of screening and whether the surgery had high or low screening rates. In this way we moved from initial to focussed codes. The lead researcher's coding was checked by a second researcher who independently coded four transcripts and any disagreements were resolved by discussion. The agreement was high so no further checks were deemed necessary
Population and sample collection	A member of the research team recruited and interviewed male and female patients, aged 15-24 years in the GP surgery. This group were chosen as they are the target group to be opportunistically offered chlamydia screening in GP surgeries. Most participants were approached immediately after they had completed their consultation (irrespective of the reason for their consultation). Where it was not going to be possible to approach them following their consultation (due to surgery layout) patients were invited to participate and interviewed prior to their consultation. Of 51 patients invited to participate, 17 declined due to practical reasons (16 for time related factors and just 1 due to sexual health nature of interview) and 36 people agreed. Nine were male and the sample had an age range 15-24 years (mean age 21 years). Of our participants 24 (65%) had never had a chlamydia screen. They were recruited from six GP surgeries with screening rates ranging from 3% to 15% (screening data from 2007 NCSP data)
Inclusion Criteria	Age: 15-24 Male Female
Relevant themes	1. Personal attitudes to being offered a chlamydia screen: The majority of male and female participants had positive personal attitudes towards chlamydia screening in GP surgeries. "I'd prefer it at the doctors.... I've been coming here basically since I was born.... so I like coming here"

	2. Subjective Norms to being offered a screen at the GP surgery: About half of the participants believed that doctors and nurses did want them to be screened, mostly because it was good for their health. "yeah I should imagine they'd want you to wouldn't they because they're doctors and they want to make sure you're healthy" 3. Barriers to accepting a chlamydia screen at the surgery. "I don't think they [doctors and nurses] give you enough time to talk about anything, I feel quite rushed" 1. Embarrassment 2. Scared of results and outcome 3. Lack of knowledge 4. Practical barriers 4. Facilitators for accepting a chlamydia screen at the GP surgery. "Especially if they [doctors] talked about it and offered a test" 1. Raising awareness 2. Characteristic of doctor or nurse

Critical appraisal - CASP qualitative checklist

Section	Question	Answer
Aims of the research	Was there a clear statement of the aims of the research?	Yes
Appropriateness of methodology	Is a qualitative methodology appropriate?	Yes
Research Design	Was the research design appropriate to address the aims of the research?	Yes
Recruitment Strategy	Was the recruitment strategy appropriate to the aims of the research?	Yes
Data collection	Was the data collected in a way that addressed the research issue?	Yes
Researcher and participant relationship	Has the relationship between researcher and participants been adequately considered?	Yes
Ethical Issues	Have ethical issues been taken into consideration?	Yes
Data analysis	Was the data analysis sufficiently rigorous?	Yes
Findings	Is there a clear statement of findings?	Yes
Research value	How valuable is the research?	The research is valuable
Overall risk of bias and relevance	Overall risk of bias	Low
Overall risk of bias and relevance	Relevance	Highly relevant

Jackson, 2021

Bibliographic Reference	Jackson, Louise; Al-Janabi, Hareth; Roberts, Tracy; Ross, Jonthan; Exploring young people's preferences for STI screening in the UK: A qualitative study and discrete choice experiment.; Social science & medicine (1982); 2021; vol. 279; 113945

Study Characteristics

Study type	Focus Groups Interviews
Aim of study	1. Identify the characteristics of STI screening provision that are important to young people; 2. Establish young people's preferences for different characteristics of STI screening and how these vary by subgroup; 3. Understand how young people make trade-offs between different service characteristics.
Theoretical approach	
Study location	Birmingham, UK
Study setting	community centres and sexual health clinics
Study dates	between August 2017 and February 2018.
Sources of funding	the Sexually Transmitted Infection Research Foundation (STIRF) and Queen Elizabeth Hospital Birmingham Charity (QEHB)
Data collection	All those invited to take part in the research were given the opportunity to take part in a focus group discussion or a one-to-one interview. The number of participants in the focus group discussions was limited to around six people, to allow participants the opportunity to share their views. Focus group discussions and one-to-one interviews were undertaken until thematic saturation was approached. Focus groups and one-to-one interviews took place in a quiet room within a community centre, sexual health clinic, or other location that was convenient to participants and were recorded with the permission of the participants. Participants provided written consent. The group discussions and one-to-one interviews adopted a semi-structured format using a topic guide. The focus groups consisted of participants who identified as the same gender in order to allow participants to feel as comfortable as possible about sharing their views.
Method and process of analysis	The qualitative focus groups and interviews were transcribed verbatim and then analysed using thematic analysis (Snow et al., 2005). Following full familiarisation with the transcripts, open codes were applied to four transcripts to identify emerging themes of relevance by researchers (Gale et al., 2013).

	This was undertaken digitally using NVivo 10 for Windows. At this stage, codes were grouped together to create and define categories, and this formed a working coding framework which was used with the rest of the data (LJ in consultation with HAJ). The researchers used the framework to code the remaining transcripts, amending the coding framework as necessary. The coding framework was applied to all transcripts to index each code. A Framework Method matrix was used to summarise and manage the data in Excel (Gale et al., 2013). The matrix involved cases/participants (rows), codes or labels (columns) and cells of summarised data. The matrix was used to compare and contrast data across and within cases (by LJ in consultation with the other authors). Connections and differences between codes were analysed to identify the factors that are meaningful and relevant to young people when they are making choices around STI screening.
Population and sample collection	Eight focus groups were undertaken in total, comprising five groups with participants recruited from varied community groups, two groups were recruited from patients attending a specialist sexual health centre and one group with men who have sex with men (MSM) was conducted via a LGBTQ+ (Lesbian, Gay, Bisexual, Transgender and Queer +) organisation in Birmingham. Purposive sampling was undertaken to include young people from a variety of social and economic backgrounds and with varied engagement with existing STI screening services (Ritchie et al., 2013). Participants in the community setting were recruited by contacting a range of community groups working with young people from different parts of the city with information about the study; of those who agreed be involved, groups were selected from different parts of the city in order to ensure a mix of young people from different social backgrounds (with guidance from youth workers in the City). Selected community organisations were then sent participant information leaflets to distribute to young people
Inclusion Criteria	Age: 16-24
Exclusion criteria	None reported
Relevant themes	1. stigma and embarrassment: The stigma associated with STIs and accessing STI screening was emphasised as a barrier. “People know that you can go to the hospital but I think people are either too embarrassed or too frightened to go.” 2. knowledge about STIs and risk: Young people described a situation where they have access to a range of information about STIs due to the availability of the internet on their phones. However, access to meaningful information that was easily understandable and appropriate for this age group was seen as limited. “There’s more rumours about them [STIs]. More stereotypes and rumours they’ve heard about than actual facts” 3. where to get tested: Young people did not feel that they were particularly well informed about all of the options in terms of where screening could be accessed. “The more discreet the better.” 4. how staff would treat them: The perceived stigma surrounding STIs and testing meant that young people were very sensitive to how they felt they were being treated by staff. “One of my friends said that they hate going in because they feel like they’re getting judged.” 5. what STIs to be tested for: There was a lack of knowledge about what STI testing would involve and what STIs young people needed to be tested for. There was a concern about whether the test would be

	painful and for some people there was a concern about having to give blood. “I’m no good with injections.” 6. convenience: Young people felt that access to screening needed to be rapid, however there was also a recognition that it might take some time for young people to reach a point where they wanted to access screening. “If they’re trying to down-play the situation they might wait until they show the symptoms.”

Critical appraisal - CASP qualitative checklist

Section	Question	Answer
Aims of the research	Was there a clear statement of the aims of the research?	Yes
Appropriateness of methodology	Is a qualitative methodology appropriate?	Yes
Research Design	Was the research design appropriate to address the aims of the research?	Yes
Recruitment Strategy	Was the recruitment strategy appropriate to the aims of the research?	Yes
Data collection	Was the data collected in a way that addressed the research issue?	Yes
Researcher and participant relationship	Has the relationship between researcher and participants been adequately considered?	Yes
Ethical Issues	Have ethical issues been taken into consideration?	Yes
Data analysis	Was the data analysis sufficiently rigorous?	Yes
Findings	Is there a clear statement of findings?	Yes
Research value	How valuable is the research?	The research is valuable
Overall risk of bias and relevance	Overall risk of bias	Low
Overall risk of bias and relevance	Relevance	Highly relevant

Jones, 2017

Bibliographic Reference	Jones, Leah Ffion; Ricketts, Ellie; Town, Katy; Rugman, Claire; Lecky, Donna; Folkard, Kate; Nardone, Anthony; Hartney, Thomas Nathan; McNulty, Cliodna; Chlamydia and HIV testing, contraception advice, and free condoms offered in general practice: a qualitative interview study of young adults' perceptions of this initiative.; The British journal of general practice : the journal of the Royal College of General Practitioners; 2017; vol. 67 (no. 660); e490-e500

Study Characteristics

Study type	Semi structured interviews
Aim of study	to expand on the previous research and use qualitative methods to explore patients' attitudes to this wider 3Cs and HIV offer, using the theory of planned behaviour to provide an understanding of any potential facilitators or barriers to implementing this intervention.
Theoretical approach	theory of planned behaviour
Study location	Bournemouth and Poole, Warwickshire, and Plymouth, UK
Study setting	GP surgeries
Study dates	March to June 2013
Sources of funding	This study was funded by the EU Leonardo Transfer of Innovation grant (grant number: 2012-1-GB2-LEO05.08044).
Data collection	The interview schedule (Appendix 1) was based on previous research examining attitudes towards, and preferences for, chlamydia screening,5 and was agreed by a steering group. The steering group was an advisory group for the National Chlamydia Screening Programme in the delivery of the 3Cs and HIV project. The purpose of the group was to ensure the 3Cs and HIV project is developed and delivered in a way that is relevant, supportive of, and appropriate for primary care, and to ensure primary care ownership of the 3Cs and HIV project. Its purpose was also to ensure that decisions made by the project group were informed by the reality of primary care practice on the ground and to inform the content and style of 3Cs and HIV intervention. Members of the steering group include a service user, GPs, and practice nurses, and was piloted with three patients. The final semi-structured interview schedule followed the broad topic areas within the theory of planned behaviour's conceptual framework in order to understand the influences on behaviour (Figure 1).11 The broad areas discussed included: • interviewees' attitudes towards being offered opportunistic chlamydia screening, contraception, condoms, and HIV tests at a GP practice (attitudes); • perceived staff and friends' attitudes • perceived barriers and self-efficacy (perceived behavioural control); and • opinions on receiving 3Cs and HIV.

	Three researchers conducted the interviews. Participants were aware that the researchers were not affiliated with the GP practice and were encouraged to discuss their opinions freely. Interviews lasted 20–30 minutes, were audio-recorded, transcribed verbatim, and checked for accuracy
Method and process of analysis	Data were analysed by a fourth researcher using a thematic framework in NVivo (version 10). Data saturation was reached, themes were refined, and redundant or infrequent codes were recoded. One-third of transcripts were double coded by a second researcher. Codes were discussed and an agreed consensus was reached on an appropriate framework.
Population and sample collection	Practices provided researchers with an anonymised list of patients within the 16–24 age bracket attending the surgery that day and their appointment time, in order to assist researchers in identifying potential participants. Researchers approached patients in the waiting area of 11 general practices (irrespective of their reason for attendance) from March to June 2013 and invited them to participate in a face-to-face interview in private. (The results could not be published sooner because this study relates to another study using a McNulty–Zelen design.)10 When researchers approached potential participants, they introduced themselves and explained the nature of the study Thirty interviews were conducted with nine male and 21 female patients, aged 16–24 years. Eighteen participants were aged ≥21 years and 12 participants were aged 16–20 years. None of the participants objected to any questions and all interviews were completed in full.
Inclusion Criteria	Age: 16-24

Relevant themes	1. Patient preferences for location, method, and member of staff: nearly all participants interviewed would be happy to be screened for chlamydia in their GP practice. "Probably preferable here, it's more convenient, you can sort of kill two birds with one stone, see the doctor and get two things done at once"
	2. Other important factors for patients. "At our medical centre there's a box, a big like box, with chlamydia tests in the bathroom, which I think's a good idea"
	    1. The convenience of taking a test
	    2. The offer of testing should be routine
	    3. Reassurance around testing is key.
	3. Barriers and perceived barriers to discussing and accepting an offer of 3Cs and HIV. "Should be OK unless, I don't know, if my parents were around it would be a bit awkward."
	    1. Embarrassment and unease around testing
	    2. Time
	4. Facilitators and suggestions for raising awareness and highlighting the importance of trust and confidentiality. "So I think it's better to outline the different options and let the patient make up their mind about which one's best."
	    1. Raising awareness of sexual health services
	    2. Trust in GP staff, and reassuring confidentiality
	5. Knowledge of chlamydia, screening, chlamydia treatment, contraception, and sexual health services: Nearly all participants knew at least one fact about chlamydia and screening: around where to

	obtain a test, duration to receive results, or methods of testing. "'Umm, I know it's done by a nurse, and I know that you can come in, get it done and get the results in a few days"
Additional information	views that relate only to HIV testing were not extracted

Critical appraisal - CASP qualitative checklist

Section	Question	Answer
Aims of the research	Was there a clear statement of the aims of the research?	Yes
Appropriateness of methodology	Is a qualitative methodology appropriate?	Yes
Research Design	Was the research design appropriate to address the aims of the research?	Yes
Recruitment Strategy	Was the recruitment strategy appropriate to the aims of the research?	Yes
Data collection	Was the data collected in a way that addressed the research issue?	No *(Not fully - did not ask about participants sexual health or demographics, so important context is missing.)*
Researcher and participant relationship	Has the relationship between researcher and participants been adequately considered?	Yes
Ethical Issues	Have ethical issues been taken into consideration?	Yes
Data analysis	Was the data analysis sufficiently rigorous?	Can't tell *(Very brief description)*
Findings	Is there a clear statement of findings?	*Yes*
Research value	How valuable is the research?	The research is valuable
Overall risk of bias and relevance	Overall risk of bias	Moderate
Overall risk of bias and relevance	Relevance	Partially relevant *(Was not specifically in clinics who were implementing testing, and interviews were on both chlamydia and HIV testing.)*

Loaring, 2013

Bibliographic Reference	Loaring, Jessica; Hickman, Matthew; Oliver, Isabel; Campbell, Rona; Trotter, Caroline; Macleod, John; Pye, Karl; Crichton, Joanna; Horner, Paddy; Could a peer-led intervention increase uptake of chlamydia screening? A proof of principle pilot study.; The journal of family planning and reproductive health care; 2013; vol. 39 (no. 1); 21-8

Study Characteristics

Study type	Focus Groups
Aim of study	to report the experiences, meanings and reality of participant's feelings towards chlamydia screening
Theoretical approach	None
Study location	Bristol, UK
Study setting	Brook centre (a nationwide sexual health support and advice service for under-25s)
Study dates	Not stated
Sources of funding	This work was supported by a grant from the Health Protection Agency R&D Pump-Priming & Small Initiatives Fund.
Data collection	One-to-one interviews with young men (n=6, age range 16–21 years, three in further education and three in higher education) and a single focus group with young women (n=6, age range 17–20 years, three in further education, two in higher education and one in full-time employment) were conducted prior to screening kits being given out. Follow-up telephone interviews (n=11, failed to contact one male participant) took place 4–8 weeks following first contact. The Focus Group Topic Guide (copy available from the authors) was adapted to fit the questioning needs of the one-to-one interviews. The focus group lasted 2 hours, the interviews up to 1 hour and the telephone follow-up was of 15–20 minutes' duration. The focus group took place at the local Brook Centre; the interviews took place at the Brook Centre or the University of Bristol. Following a description of the study and details of participation, written informed consent was gained from each participant. The focus group and interviews followed a broadly similar set of questions around the following: ‣ Thoughts and feelings about the chlamydia test and chlamydia in general ‣ Awareness of the NCSP ‣ Views on levels of awareness of chlamydia among friends and sexual partners ‣ Exploration of how much they talk to friends and sexual partners about sexual health issues and how comfortable they feel having such conversations

	▸ Thoughts on how friends and sexual partners would respond to an invitation to be tested for chlamydia as part of a national screening programme.
Method and process of analysis	The focus group and interviews were audio-taped and transcribed verbatim for analysis. One researcher (JL) conducted thematic analysis of the data to identify, compare and report patterns in the data.14 Two further researchers (PH and MH) reviewed the transcripts for agreement on themes. As this was an exploratory pilot study, saturation techniques were not applied to the data. In this study thematic analysis was used as a realist method14 aiming to report the experiences, meanings and reality of participant's feelings towards chlamydia screening. During analysis each transcript was studied repeatedly to create and develop themes that were reviewed and defined. These themes were inductive in nature, meaning that they were strongly attached to the data rather than existing theory. During the analysis process, continuous consideration was given to whether the analysis provided a convincing and well-organised representation of the data and the topic.
Population and sample collection	Females were recruited through a local Brook Centre (a nationwide sexual health support and advice service for under-25s). Males were difficult to recruit via this strategy, therefore they were sampled from local colleges and universities through a sexual health stand at fresher's week events. All participants had expressed an interest in undergoing chlamydia screening or had already been screened. Twelve young people took part in the focus group and interviews: six females in the focus group and six males in the interviews. A total of 45 kits were distributed following focus groups and interviews, 23 female kits and 22 male kits.
Inclusion Criteria	None reported
Relevant themes	1. Awareness of STIs: Therefore knowledge and confidence in talking about symptoms was mixed. "Doesn't it make it painful when you piss, is that actually what it is though?" 2. Discussing STIs with others and chlamydia screening: Both males and females said they would confide in their close friends about chlamydia screening. Men tended to feel less self-assured than women about discussing STIs. "It's usually joked about, for example programmes like South Park always make jokes about STIs and stuff like having AIDS." 3. Chlamydia screening postal kits: It was generally felt that the kits were a good idea and reduced barriers to access to screening by not having to attend a clinic. "It would save us coming here and sitting here trying not to look anyone in the eye" 4. Results from follow-up interviews: All participants were followed up between 4 and 8 weeks after initial participation. It appeared that males felt uncomfortable with discussing the screening kits and some preferred not to talk about it at all. Females felt more confident than males about discussing chlamydia screening and offering kits to their friends. "I gave it to my housemate and he thought it was really funny.

	We didn't really talk about it, he just took it and it wasn't mentioned again."
Additional information	Twelve young people took part in the focus group and interviews: six females in the focus group and six males in the interviews. A total of 45 kits were distributed following focus groups and interviews, 23 female kits and 22 male kits. The majority of kits were taken by women participants (n=33, 73%) all of whom reported giving out at least one kit to a member of their social network, with a total of 26/33 (79%) kits given out. By contrast only two men gave out a total of three kits. Details of the screening kits taken at initial data collection and those subsequently returned for testing are presented in Table 1. At least one kit was returned from 5/6 of the social networks contacted by the participating women. In total 10 kits were returned for testing. All kits returned originated from female participants; none of the three kits given out by men were returned. The return rate indicates an average of 1.7 packs returned per woman participating, 38% (10/26) of the kits women gave to peers.

Critical appraisal - CASP qualitative checklist

Section	Question	Answer
Aims of the research	Was there a clear statement of the aims of the research?	No
Appropriateness of methodology	Is a qualitative methodology appropriate?	No
Research Design	Was the research design appropriate to address the aims of the research?	No
Recruitment Strategy	Was the recruitment strategy appropriate to the aims of the research?	Yes
Data collection	Was the data collected in a way that addressed the research issue?	Yes
Researcher and participant relationship	Has the relationship between researcher and participants been adequately considered?	No
Ethical Issues	Have ethical issues been taken into consideration?	Yes
Data analysis	Was the data analysis sufficiently rigorous?	Yes *(Qualitative yes, quantitative no.)*
Findings	Is there a clear statement of findings?	Yes

Section	Question	Answer
Research value	How valuable is the research?	The research has some value
Overall risk of bias and relevance	Overall risk of bias	High
Overall risk of bias and relevance	Relevance	Partially relevant *(The data does not address the intervention adequately. Views on home testing in general are useful though.)*

Lorimer, 2013

Bibliographic Reference	Lorimer, Karen; McDaid, Lisa; Young men's views toward the barriers and facilitators of Internet-based Chlamydia trachomatis screening: qualitative study.; Journal of medical Internet research; 2013; vol. 15 (no. 12); e265

Study Characteristics

Study type	Focus Groups
Aim of study	to explore the barriers and facilitators to implementing an Internet-based chlamydia screening approach, including the acceptability of such an approach.
Theoretical approach	None stated
Study location	Scotland, UK.
Study setting	University and community spaces
Study dates	Not stat
Sources of funding	This study was funded by the Chief Scientist Office at the Scottish Government (CZG/2/515). Lisa McDaid is funded by the UK Medical Research Council as part of the Sexual Health program (MC_A540_5TK60) at the MRC/CSO Social and Public Health Sciences Unit, University of Glasgow.
Data collection	Focus groups lasted between 1-2 hours and took place in private spaces made available by our community partners or at the university, with the same facilitator. At the start of each focus group, after consent forms were completed, participants were asked to verbally confirm their postcode. The ensuing focus group discussions focused on knowledge of chlamydia, technology use and attitudes towards smartphones and the Internet, and views on sample screening letters and websites. Focus groups began with participants being asked to describe their knowledge of chlamydia and then technology use, including use of a mobile (cell) phone and the Internet. Participants were invited to reflect on the amount of access they had to, and their use of, such technologies, how private their use was, and their desire for more or less technology use. Insights were then gained from men about their willingness to participate in a proactive screening approach, which made use of the Internet and postal testing kits. To facilitate these discussions, we described the proposed proactive approach to screening as shown in Figure 1. Young men were first shown three sample screening invitation letters (each were different in order to elicit their style and content preferences) to be sent from GPs (general practitioner), or via a central register, and then a sample postal test kit, before being shown on a laptop existing UK-based websites offering

	chlamydia screening. Five sites were shown, with each chosen to present a range of styles and content for the men to comment on their preferences (see Multimedia Appendix 1). A semi-structured topic guide was designed to guide participants through these topic areas in order to build a picture of potential barriers and facilitators to a proactive, Internet-based approach to chlamydia screening.
Method and process of analysis	Group discussions were audio-recorded and transcribed verbatim and checked. QSR NVivo 10 was used to facilitate analysis. Transcripts were read repeatedly by the researcher and a thematic coding framework was developed as a collaborative effort within the research team (including KL and LM); we then used the “Framework” approach, where data are coded, indexed, and charted systematically, then organized using a matrix or framework [36]. The five key stages of Framework are: familiarization, identifying a thematic framework, indexing, charting, mapping, and interpretation. Framework analysis begins deductively from the study aims and objectives (generating prepositions), but is also inductive (using patterns and associations derived from observations) [37]. Constant comparison was carried out to check for deviant cases as well as similarities, in an iterative process. During analysis, we explored participants’ attributes (eg, age, deprivation), in which we had an a priori interest, against the various themes to rigorously explore emergent patterns in response, particularly by age and deprivation.
Population and sample collection	Men were recruited via a range of non-clinical settings, including workplaces, health and fitness settings, community groups, and further education settings (post-high school age but lower than university level). A mixture of purposive and snowball sampling was used to ensure a heterogeneous sample for a range of characteristics: age, socioeconomic background, and ethnicity. Focus groups were homogenous by age group, ethnicity, and deprivation. Fifteen focus groups were conducted with men aged 16-24 years (n=60 individuals), with a minimum of 3 and maximum of 5 participants in the groups. The young men were sociodemographically diverse and most groups consisted of pre-existing friendship or work networks. In only one group did the participants not know each other. Table 1 shows demographic information about the groups. Of the 15 groups, 8 were of men aged 16-19 years and 7 with men aged 20-24 years. Nine groups were of men from deprived areas and 6 from non-deprived areas. Most (11/15) were from urban areas.
Inclusion Criteria	Age: 16-24 Location: Urban or semi-rural Male
Relevant themes	1. Men’s Technology Use: While most men used the Internet every day, their use was heterogeneous in terms of individual practices using new technologies. "I’m doing alright. I’ve now got ten things in my house connected to the Internet."

	2. Acceptability of Proactive Screening: Participants described feeling inclined to be screened using this approach due to their perceptions of the ease and convenience with which they could be tested. "The anonymous part of this is just brilliant compared to having to sit [at a clinic]." 3. Privacy and Confidentiality Concerns: Participants, across almost all groups, described privacy and confidentiality concerns in relation to most aspects of the proposed Internet-based screening approach. "If my ma finds it [letter] man, I'll kill her before she kills me. " 4. Language, Style, and Content: Participants wanted screening invitation letters and a screening website to have content that is salient, credible, and straightforward. "Why do they keep putting, like, "R U" and stuff? I actually don't know anyone who texts like that anymore. "

Critical appraisal - CASP qualitative checklist

Section	Question	Answer
Aims of the research	Was there a clear statement of the aims of the research?	Yes
Appropriateness of methodology	Is a qualitative methodology appropriate?	Yes
Research Design	Was the research design appropriate to address the aims of the research?	Yes
Recruitment Strategy	Was the recruitment strategy appropriate to the aims of the research?	Yes
Data collection	Was the data collected in a way that addressed the research issue?	Yes
Researcher and participant relationship	Has the relationship between researcher and participants been adequately considered?	Yes
Ethical Issues	Have ethical issues been taken into consideration?	Yes
Data analysis	Was the data analysis sufficiently rigorous?	Yes
Findings	Is there a clear statement of findings?	Yes
Research value	How valuable is the research?	The research is valuable
Overall risk of bias and relevance	Overall risk of bias	Low
Overall risk of bias and relevance	Relevance	Highly relevant

Middleton, 2021

Bibliographic Reference	Middleton, Alan; Laidlaw, Rebecca; Pothoulaki, Maria; Vojt, Gabriele; Estcourt, Claudia S; Woode Owusu, Melvina; Mapp, Fiona; Flowers, Paul; How can we make self-sampling packs for sexually transmitted infections and bloodborne viruses more inclusive? A qualitative study with people with mild learning disabilities and low health literacy; Sexually Transmitted Infections; 2021; vol. 97 (no. 4); 276-281

Study Characteristics

Aim of study	To explore barriers and facilitators to correct use of an STI/BBV self-sampling pack among people with mild learning disabilities.
Theoretical approach	Inductive thematic analysis
Study location	Scotland, UK
Study setting	Community settings in central Scotland.
Study dates	Data collected between July and August 2018
Sources of funding	National Institute for Health Research (NIHR) under its Programme Grants for Applied Research (reference number RP-PG-0614-20009).
Data collection	Participants were required to dedicate approximately 1 hour to the study and had the option of a support person being present for part or all of the research activities. Participants were compensated with a £30 voucher. All interviews were audio-recorded using digital devices and were transcribed in a Word document format for the purpose of analysis. Data collected were fully anonymised for reporting, presentation, archiving and/or publication purposes.
Method and process of analysis	Combined focus group and individual interview data. Deductive and inductive thematic analyses of audio transcripts to explore issues associated with the barriers and facilitators to correct use of the pack and its contents.
Population and sample collection	In total, they conducted four interviews with one male and three female participants, and five focus groups that comprised three all-male groups with a total of 11 participants and two all-female groups with a total of 10 participants.
Inclusion Criteria	Criteria 1 Mild learning disabilities. Age: 18-65 Men who have sex with men Heterosexual
Exclusion criteria	Not fluent in English

Relevant themes	**Accessing sexual healthcare** This theme identified some of the significant challenges that participants experience, particularly when accessing and trying to understand new and complex information. Participants' knowledge of STIs was limited and this compounded the challenges of grasping new information. Although the participants all had a mild learning disability, this encompassed a range of cognitive abilities, specific difficulties and literacy skills. Written information was thought to be particularly challenging or inaccessible by all. *"If you've got learning difficulties, you need the help. You can't just read that…" [leaflet] (Female)* *"Well, you've explained it [self-sampling pack] to me so it's easy when somebody's explaining to me." (Female)* *"…but if you don't have a comprehension about why you'd be getting this [self-sampling pack], so that would freak you out." (Female)* **Support from others** Many participants explained that decisions about their health and well-being are often undertaken by others and restrictions put on risk-taking behaviours. Some participants continue to live with parents, highlighting this as a particular difficulty for sexual health when privacy was important. Most participants received some support in their daily lives and often relied on guidance from others when navigating uncertain and unfamiliar areas. This was often with someone they trust and where privacy is respected, which was also the case when faced by a self-sampling pack. Participants voiced a need for someone else to help navigate the pack, and due to the sensitivity or privacy around sexual health issues this was an additional consideration when asking for help. For some, the complexity of the pack and the knowledge and understanding required to undertake self-sampling meant that they would rather go to their general practitioner (GP) or sexual health service than try themselves. *"…if you live at home, with no support, and you don't want your mum to know that you're sexually active, how do you go about it?" (Female)* *"I wouldn't ask somebody that I couldn't trust because I would like to keep that private." (Female)* *"I'd get my support worker to help me." (Male)* *"I'd rather go to the doctor's, 'cause then you'd know what's getting done, right then." (Female)*

Using the pack

Most participants described feeling overwhelmed to varying degrees when opening the pack and did not know where to start. This could prevent them from proceeding further.

Most participants found the details included in the chlamydia information sheets (the infection, health consequences, treatment and partner notification) to be too long and difficult to read. They could not relate the information to the actual sampling kits in the pack.

Despite the challenges voiced by most of the participants, the opportunity to use a self-sampling pack at home was welcomed by some due to convenience. Some also perceived self-sampling

less embarrassing than attending a sexual health clinic or GP.

"…it's not giving you, like, instructions, like it's not a clear indication there of how to use it." (Female)

"Well, to be honest with you, it can be a bit daunting." (Male)

"Are these for likes of to find out if you've got sexual diseases as well…as well as doing it the other way? Because I've not heard of doing it this way." (Female)

Accessibility of the pack

The inclusion of diagrams and pictures was seen as a welcome step towards an easier-to-read format by all participants. However, participants voiced problems interpreting the diagrams which

illustrated the anatomical sites for self-sampling. This was a particular problem for women who had difficulties relating the diagrams to their own anatomy. Written information relating to

each of the tests contained in the pack was felt to enhance the usability of the pack.

Participants suggested several improvements to aid clarity and remove ambiguity. These included adopting an 'easy read' format, avoiding columns of text, and simplifying how the key health messages are presented within the pack to create a more user-friendly feel. Specific suggestions included making it easier to identify items mentioned in the guidance notes with the pack components by numbering them and cross-referencing. For some, an accompanying online 'YouTube' video would be welcomed.

"…the steps, the diagram is okay, but the writing should be a [little] bit bigger." (Male)

"…because it [stages on leaflet] goes across, and down, is that confusing, would it be easier if it had everything in a row?" (Female)

Contents of the pack

The number of test components in the pack created some anxiety and participants had difficulty understanding their purpose. The perceived lack of a clear process and sequence for undertaking the different activities needed to successfully self-sample was problematic. Interpreting anatomical diagrams depicting sampling sites and diagrams showing what to do with the samples were thought to be particularly challenging.

Condoms contained in the pack were familiar to most participants and were seen as a positive step in preventing future STIs.

"Yeah, but it's not explaining it more, see if it's done the right way or the wrong way… so it's not clear… I think that would be a lot tricky for some people to get caught out on." (Male)

"But what, why, what STI is it for? [self-sampling pack]" (Female)

"But it's like, they've gave you a blood sample bottle, but they've given you nothing to take it with." (Male)

"Definitely include them [condoms] because people might not want to get infected again." (Female)

Using the contents of the pack

Overall participants found the process daunting and at times confusing. They voiced fears about efficacy, most stating that they would need support to undertake the tests. Obtaining samples was felt to be particularly difficult; most participants felt unclear about what was required, how to take the samples and what to do with them subsequently.

Many women did not seem to have sufficient understanding of their own anatomy and experienced difficulties in interpreting the anatomical diagrams. This led to a lack of confidence in their ability to follow the instructions provided to take a vulvovaginal swab. They also voiced concerns about appropriate technique and the potential for issues with reliability of the test by doing it incorrectly.

The motor skills and manual dexterity required for taking blood samples gave cause for concern and were felt to be a significant barrier to successful self-sampling. However, where participants had previous experience of similar procedures, such as diabetic monitoring, the familiarity gave more confidence.

"I'm not going to say what I think… I just call it my back passage…See, you wouldn't know if that's the back to the front… [anatomical diagram]." (Female)

"Because I think you could do the swab, and you might have taken it wrongly. Or you could have taken it incorrectly, and it would have given an improper reading." (Female)

"These [blood sample kit] look like what, if you're a diabetic, you have to go and get your sugars done, and that's what I was meaning." (Female)

	"I'm diabetic, so I know I'm used to needles." (Male)

Critical appraisal - CASP qualitative checklist

Section	Question	Answer
Aims of the research	Was there a clear statement of the aims of the research?	Yes
Appropriateness of methodology	Is a qualitative methodology appropriate?	Yes
Research Design	Was the research design appropriate to address the aims of the research?	Yes
Recruitment Strategy	Was the recruitment strategy appropriate to the aims of the research?	Yes
Data collection	Was the data collected in a way that addressed the research issue?	Yes
Researcher and participant relationship	Has the relationship between researcher and participants been adequately considered?	Can't tell
Ethical Issues	Have ethical issues been taken into consideration?	Yes
Data analysis	Was the data analysis sufficiently rigorous?	Yes
Findings	Is there a clear statement of findings?	Yes
Research value	How valuable is the research?	The research is valuable
Overall risk of bias and relevance	Overall risk of bias	Low
Overall risk of bias and relevance	Relevance	Highly relevant

Normansell, 2016

Bibliographic Reference	Normansell, Rebecca; Drennan, Vari M; Oakeshott, Pippa; Exploring access and attitudes to regular sexually transmitted infection screening: the views of young, multi-ethnic, inner-city, female students.; Health expectations : an international journal of public participation in health care and health policy; 2016; vol. 19 (no. 2); 322-30

Study Characteristics

Study type	Semi structured interviews Either single interviews or in pairs
Aim of study	to explore access and attitudes to STI screening in high risk,20 young, ethnically diverse female students recruited outside of the healthcare system.
Theoretical approach	'Candidacy', the theory of planned behaviour, and stigma theories
Study location	London, UK
Study setting	an inner-London further education college
Study dates	Between January and March 2013
Sources of funding	This work was funded by the Scientific Foundation Board of the Royal College of General Practitioners [SFB-2013-01]. Pippa Oakeshott is a member of the NIHR South London Collaboration for Leadership in Applied Health Research and Care. She is also a member of the esti2 consortium which is funded under the UKCRC Translational Infection Research Initiative supported by the Medical Research Council (Grant Number G0901608) with contributions from the Biotechnology and Biological Sciences Research Council, the National Institute for Health Research on behalf of the Department of Health, the Chief Scientist Office of the Scottish Government Health Directorates and the Wellcome Trust.
Data collection	Interviews lasted between 20 and 60 min and were audio-recorded in a private room. As some of the younger women did not want to be interviewed on their own, we adapted the protocol to allow interviews in pairs. Participants were recruited until no new themes were identified in either interviews or analysis of transcriptions to ensure that data saturation was achieved. We chose a qualitative methodology in the interpretive tradition6 using semi-structured interviews and a topic guide (Table 1). This allowed confidential in-depth exploration of potentially sensitive and personal issues. We developed the questions by drawing on the literature and by discussion between the authors
Method and process of analysis	Audio recordings were transcribed and checked for accuracy. Transcripts were read and re-read for familiarisation and coded, and a thematic framework was produced.22 This was informed both by a priori issues and emerging themes and refined in discussion with co-authors. Data were then indexed and charted to allow both case and theme analysis. In the analysis process, potential explanatory framing theories such as that of 'candidacy',6 the theory of planned behaviour23 and stigma24 were discussed and tested against the data

Population and sample collection	The sampling was semipurposive and the researcher attempted to recruit women throughout the target age range and from different ethnic groups. (More structured purposive sampling was not possible due to the opportunistic approach.) 25 women were invited to take part in the study. Three were ineligible (outside age range n = 2, inadequate English n = 1). Of the 22 eligible participants approached, 17 (77%) agreed to be interviewed and five declined citing time constraints/imminent exams. Recruitment ceased when thematic saturation was achieved. The mean age of participants was 19.9 years (range 16–25), and they self-assigned their ethnicity21 as white 35%, Black Caribbean 24%, mixed or multiple ethnic background 24%, Black African 6%, Asian 6% and other (Arab) 6%. For 8/17 (47%), English was not their first language. Participants were studying a range of courses including: media studies, access to biomedical sciences, access to nursing/midwifery, applied sciences, and health and social care.
Inclusion Criteria	Age: 16-27 Female
Exclusion criteria	Not fluent in English
Relevant themes	1. Perceived value of getting tested: STI testing was universally perceived positively: discovery and treatment of an STI were beneficial. "I'm thinking I really should get screened again because love him to bits though I do, I don't know where he's been..." 2. Perceptions of others: what will other people think about me getting tested?: Participants feared having their identity 'tainted' or 'spoiled' by the need to get tested. "And my mum took offence... 'What are you trying to say, my daughter sleeps around?'... if your daughter is seen using that [the self-taken swab] you will be chucked off your balcony..." 3. Removing barriers to accessing STI screening: They valued an easily accessed, competent service to facilitate testing, perhaps backed by text reminders. The convenience of a postal sample kit was identified. "... So if there was a sort of set-up with advertising and with reminders and things, that would be really helpful because I have a memory like a leaky sieve."
Additional information	

Critical appraisal - CASP qualitative checklist

Section	Question	Answer
Aims of the research	Was there a clear statement of the aims of the research?	Yes

Section	Question	Answer
Appropriateness of methodology	Is a qualitative methodology appropriate?	Yes
Research Design	Was the research design appropriate to address the aims of the research?	Yes
Recruitment Strategy	Was the recruitment strategy appropriate to the aims of the research?	Yes
Data collection	Was the data collected in a way that addressed the research issue?	Yes
Researcher and participant relationship	Has the relationship between researcher and participants been adequately considered?	Yes
Ethical Issues	Have ethical issues been taken into consideration?	Yes
Data analysis	Was the data analysis sufficiently rigorous?	Yes
Findings	Is there a clear statement of findings?	Yes
Research value	How valuable is the research?	The research is valuable
Overall risk of bias and relevance	Overall risk of bias	Low
Overall risk of bias and relevance	Relevance	Partially relevant *(Downgraded because it addresses interventions amongst other topics rather than being focused on an intervention.)*

Powell, 2016

Bibliographic Reference	Powell, Rachael; Pattison, Helen M; Marriott, John F; Perceptions of Self-Testing for Chlamydia: Understanding and Predicting Self-Test Use.; Healthcare (Basel, Switzerland); 2016; vol. 4 (no. 2)

Study Characteristics

Study type	Semi structured interviews
Aim of study	The main aim of the present study was to explore self-testing for chlamydia from the perspective of young adults, to identify factors that may predict self-testing outside the context of formal screening programmes and to understand how self-test use impacts on individuals. However, a key secondary aim was to identify theoretical domains that explain the qualitative findings and which could form an effective framework for further research.
Theoretical approach	Protection Motivation Theory and Theory of Planned Behaviour
Study location	West Midlands, UK
Study setting	University
Study dates	Not stated
Sources of funding	Rachael Powell was funded by a RCUK (Research Councils United Kingdom) Academic Research Fellowship at Aston University when conducting this research.
Data collection	Semi-structured interviews were conducted by the first author at the university, audio-recorded and transcribed verbatim. Topics covered included experiences of self-testing, perceived advantages and disadvantages of self-testing, how participants would feel on receiving a positive result and others' perceptions about participants self-testing for chlamydia. A funnelling approach was used: earlier questions were broad to encourage participants to discuss aspects they considered important; later items were more focused, ensuring that aspects relevant to theories were discussed. Interviews were audio-recorded and transcribed verbatim. Participants were recruited until data saturation was observed i.e., no new themes were identified, and there were no issues arising regarding categorising data [18]. When it became clear to the lead and co-author, through detailed discussion of the data, that no new issues were arising in interviews, recruitment ceased. Interviews ranged from 25 to 48 minutes in length; the median duration was 35 minutes
Method and process of analysis	A thematic analysis of the interviews was conducted using a Framework approach [19,20]. The analysis was thematic in that we aimed to organize, describe, and understand the thoughts, feelings, and experiences of participants related to self-testing for chlamydia. A Framework approach [20] was followed to conduct the analysis because it is a systematic approach which allows comparisons to be made both within and between participants, and it can be easily accessed by other people: there is a clear trail by which other researchers can see the steps made by the analyst and assess the validity of the analysis. Transcripts were read and re-read, and thoughts, comments, and themes were noted on the manuscript. A list of superordinate and sub-themes was devised and used to code the manuscript line-by-line. The coded manuscripts enabled the creation of charts indexing extracts

	belonging to each theme for each participant, with details of the location of extracts in interview transcripts. These charts allowed the researchers to view the content of themes within and between participants, without losing sight of how extracts were embedded in the data. The charts were used to structure the study results according to theme with supporting evidence given verbatim. The lead author met with the second author regularly throughout the project to discuss progress and issues arising, and to make the decision as to when to stop interviewing. The detailed analysis records made by the lead author allowed a co-author to undertake independent analysis of a sample of transcripts (4 of 18, 22%). The co-author agreed with the understanding of the data reached by the lead author, ensuring validity of the analysis. After 18 interviews were complete the lead and second author decided no further new data were arising and saturation point had been met. The analysis was primarily structured around the participants' responses rather than by the theoretical models. To meet the secondary aim of the study, the qualitative findings were then related to theoretical models that have been used to explain and predict behaviour in other screening contexts using abductive inference.
Population and sample collection	Participants were students at a university in the West Midlands, UK, and were recruited using emails to student mailing lists. Emails stated that we would particularly like to talk with people who had used a self-test kit for chlamydia, or whose partner had used one. Participants were paid £20. Nineteen people participated in an interview; one had never been sexually active (and had not self-tested) and was excluded from analysis. Sample size of 18 participants. All participants who had self-tested received negative test results; one participant (F2(ST)) was awaiting her result. Median age (years) 22.5 (18–26). 15 female, 3 male.
Inclusion Criteria	Have had sex at least once Has used a self test kit Or partner has used one. University students
Exclusion criteria	Not sexually active

Relevant themes	1. Experiences of Using Tests: participants apparently self-tested because they were given the opportunity to test; awaiting test results might be more anxiety-provoking for people who actively seek testing. "I wouldn't have even thought to do one if I hadn't seen them"
	2. Barriers to Self-Testing. ""with a text message you would probably be a bit more like 'hah' (breath intake) . . . because then you'd have to . . . make another appointment""
	    1. Method of Testing
	    2. Cost
	    3. Concerns about Test Accuracy
	    4. Absence of Professional Support
	3. Facilitators to Self-Testing. "it's confidential, you don't have to worry about what your doctor might think of you, worry what anyone else might say to you"
	    1. Privacy
	    2. Absence of Physical Examination

	3. Convenience 4. Control 4. Anticipated Responses to Positive Test Results: Concern was voiced that some people might "freak out" on receiving a positive result and not seek medical care (F1(NT)). However, all our participants said they themselves would seek medical care, often as a matter of urgency, in the event of a positive result. "I think I'd panic. And I'd probably be kicking myself, I should have been more careful" 5. Social Perceptions: Expectations and experiences of partners' responses to participants self-testing depended on the context of test use, with why someone would want to test causing concern rather than the self-testing, itself. "I'd just like to know whether they thought they might have been infected of whether they did it just for the hell of it"

Critical appraisal - CASP qualitative checklist

Section	Question	Answer
Aims of the research	Was there a clear statement of the aims of the research?	Yes
Appropriateness of methodology	Is a qualitative methodology appropriate?	Yes
Research Design	Was the research design appropriate to address the aims of the research?	Yes
Recruitment Strategy	Was the recruitment strategy appropriate to the aims of the research?	Yes
Data collection	Was the data collected in a way that addressed the research issue?	Yes
Researcher and participant relationship	Has the relationship between researcher and participants been adequately considered?	Yes
Ethical Issues	Have ethical issues been taken into consideration?	Yes
Data analysis	Was the data analysis sufficiently rigorous?	Yes
Findings	Is there a clear statement of findings?	Yes
Research value	How valuable is the research?	The research is valuable
Overall risk of bias and relevance	Overall risk of bias	Low
Overall risk of bias and relevance	Relevance	Highly relevant

Richardson, 2010

Bibliographic Reference	Richardson, D; Maple, K; Perry, N; Ambler, E; Jurd, C; Fisher, M; A pilot qualitative analysis of the psychosocial factors which drive young people to decline chlamydia testing in the UK: implications for health promotion and screening.; International journal of STD & AIDS; 2010; vol. 21 (no. 3); 187-90

Study Characteristics

Study type	Unstructured interviews
Aim of study	To develop themes and and hypotheses from interviewing young people declining chlamydia testing as to why they declined the test.
Theoretical approach	None stated
Study location	Sussex, UK
Study setting	FE colleges and University
Study dates	2007/2008
Sources of funding	Brighton and Sussex medical school student project grant
Data collection	The interviews were conducted by KM in a private room in the educational settings. Interviews lasted between 30 and 60 minutes and were recorded using a digital recorder and anonymized to maintain confidentiality. The aim of the interviews was to gather the narratives of young people who decline chlamydia tests and develop an understanding of their beliefs and behaviour, without imposing the researchers' assumptions. It was therefore important to remain open to the possibility that emerging concepts may be different from those that were being considered at the outset. The interviews were transcribed verbatim. We used a semi-structured interview schedule that explored the meaning and reasoning behind why these individuals declined a chlamydia test. A predetermined scope of enquiry schedule was used to open conversation. Questions were open-ended and we adopted a non-directive approach to encourage the volunteers to develop and collaborate their own narratives about their

	experiences and beliefs.
Method and process of analysis	Data were analysed with interpretative phenomenological analysis which seeks to capture the meaning to the participant of the phenomenon under investigation. Individual transcripts were read repeatedly and then coded to identify emergent themes. Recurrent themes were then identified across transcripts; such themes reflect a shared belief among participants of the phenomena under investigation. This was a dynamic process, cach transcript informing both the collection of further data and their subsequent analysis. DR carried out the principal analysis. The themes were agreed by DR and KM.
Population and sample collection	We recruited young people at educational institutions on occasions when the local chlamydia screening team were offering chlamydia testing. Individuals aged 16-24 years who declined a test were approached by a researcher (KM) to take part in this study. An incentive of a £10 voucher was offered to cach volunteer The sample comprised the first 14 men or women who agreed to participate. We considered this an appropriate sampling method due to problems inherent in recruitment to studies such as this and time constraints. Once they had agreed to take part, the volunteers were taken to a private room and were then given the volunteer information leaflet to read. We recruited volunteers from Park College in Eastbourne (a co-ed sixth form college for 16-19 years old). Brighton, Hove and Sussex Sixth Form College (BHASVIC) and Sussex University. Fourteen young people consented to the study, of whom 10 were women and the median age was 17 years old (16-22 years).

Inclusion Criteria	Age: 16-24 Declined an STI test
Relevant themes	1. Stigmatisation of chlamydia and taking a test: Associated with stereotypical notions of promiscuity, carelessness, and being dirty. "...well going to the clinic...all the people there....it's full of skanky 15 year olds" 2. Embarrassment: t. The young people described how all aspects of chlamydia testing was embarrassing for them on personal levels including the perceived requirement for genital examination. "...if they have to get their kit off in front of someone else it's quite embarrassing... let's face it putting your legs up in those stirrups is not the most dignified position in the world!" 3. Perceived risk of chlamydia: Current sexual activity, features of their sexual partners, symptoms and concerns about long-term complications are important. "...I knew the person I slept with so I wasn't worried about catching anything" 4. The chlamydia test: The volunteers either did not know what the test involved, or held false preconceived beliefs about what it entails. They believed that they needed to undress and be examined, have something put inside them and that the test is uncomfortable or painful. "the hardest part must be taking the test...people get really scared about it all..."

Critical appraisal - CASP qualitative checklist

Section	Question	Answer
Aims of the research	Was there a clear statement of the aims of the research?	Yes
Appropriateness of methodology	Is a qualitative methodology appropriate?	Yes
Research Design	Was the research design appropriate to address the aims of the research?	Yes
Recruitment Strategy	Was the recruitment strategy appropriate to the aims of the research?	Yes
Data collection	Was the data collected in a way that addressed the research issue?	Yes
Researcher and participant relationship	Has the relationship between researcher and participants been adequately considered?	No

Section	Question	Answer
Ethical Issues	Have ethical issues been taken into consideration?	Yes
Data analysis	Was the data analysis sufficiently rigorous?	Yes
Findings	Is there a clear statement of findings?	Yes
Research value	How valuable is the research?	The research is valuable
Overall risk of bias and relevance	Overall risk of bias	Low
Overall risk of bias and relevance	Relevance	Highly relevant

Wayal, 2011

Bibliographic Reference	Wayal, Sonali; Llewellyn, Carrie; Smith, Helen; Fisher, Martin; Home sampling kits for sexually transmitted infections: preferences and concerns of men who have sex with men.; Culture, health & sexuality; 2011; vol. 13 (no. 3); 343-53

Study Characteristics

Study type	Semi structured interviews
Aim of study	to evaluate the feasibility and acceptability of home sampling kits for STI/HIV and to evaluate the sensitivity and specificity of self-collected rectal and oropharyngeal specimens to detect Chlamydia trachomatis and Neisseria gonorrhoea among men who have sex with men. In this paper we explored participants' views to inform the development of services offering home sampling kits for STI/HIV
Theoretical approach	None stated
Study location	Brighton, UK
Study setting	genitourinary medicine clinic
Study dates	October 2005 to May 2007
Sources of funding	Medical Research Council
Data collection	Semi-structured interviews were conducted by CL between February and October 2006 in a quiet room in the clinic's research office or at the interviewee's residence. To ensure safety of the interviewer during home visits, we subscribed to the CRISYS safety monitoring system, which checks on the safety status of lone workers and, in the event of a problem occurring, has systems in place to ensure an instant response. Using a topic guide, interviews explored: (1) preferred mechanisms for offering home sampling kits, (2) perceptions about using home sampling kits to screen for various STI and HIV and (3) views about the STI clinic use and home sampling kit
Method and process of analysis	. All interviews were digitally recorded and transcribed verbatim. Framework analysis guided the analytical process. This is a matrix-based approach, which involves systematically sifting through the transcripts and charting and sorting material according to key themes and issues (Ritchie and Spencer 1993). A sub-set of transcripts were coded independently by SW and CL to identify themes applying the thematic framework. Themes were identified based on a priori issues of the topic guide and emergent and recurring issues. Discrepancies in coding were resolved by discussion between SW and CL. Emerging codes were defined to ensure consistency in coding the transcripts, following which all the transcripts were coded by SW. NVivo 10 (QSR International Pty Ltd) was used as a data management tool. The key themes were compared and contrasted to identify any differences across age-groups
Population and sample collection	Participants from a quantitative study formed the sampling frame for our qualitative study. All the survey participants were asked about their willingness to participate in a one to-one interview at a later date, with approximately 80% agreeing to participate. We used purposive quota sampling to recruit participants for these semi-structured interviews (Ritchie,

	Lewis, and Elam 2007). We purposively selected men who have sex with men from different age-groups (#29, 30–39, 40–49, $50) to ensure a wide diversity of ages. All the purposively selected 24 men who have sex with men agreed to participate in semi-structured interviews, which lasted approximately 30 minutes each (range 12–57 minutes). Six participants were recruited from each of the four age groups. The median age of the participants was 39 (range 22–68 years). The majority of the participants were homosexual, white, educated and employed.
Inclusion Criteria	Age: Over 18 Male Has used a self test kit Men who have sex with men Asymptomatic when tested

Relevant themes	1. Venues for accessing home sampling kits. "...especially on the gay scene, ... because people were always sticking buckets in my face or doing things, handing out safe sex packs and things"
	    1. Preference for medical venues
	    2. Home sampling kits in gay social venues
	    3. Home sampling kits in commercial venues
	2. Returning home collected specimens and getting results. "No, I've got the most useless postman in the world. I get other people's mail and it horrifies me to think what mail other people might get of mine"
	    1. Significance of assurance about the receipt of specimens by the clinic
	    2. Multiple choices for receiving results
	3. Testing for STI/HIV using home sampling kits: Sexual health testing was done for peace of mind, to avoid unknowingly infecting others and to seek timely treatment if diagnosed with infections. "Then you think 'I am Typhoid Mary!' It's just like having gaily sort of spreading things round Brighton you know. ... So I would use, yeah I would definitely like to keep abreast of where I am with things, yeah."
	4. Clinic use and home sampling kits: Home sampling kits were favoured by the majority of the participants for regular asymptomatic sexual health testing. However, participants expressed a preference to access a STI clinic instead of home sampling kits if they had symptoms, were exposed to infection or a sexual partner was diagnosed positive. "I think if I had symptoms I would go straight to a clinic because it's obviously something that needs ... you know medical [intervention]"

Additional information	Content relating to HIV testing was not extracted.

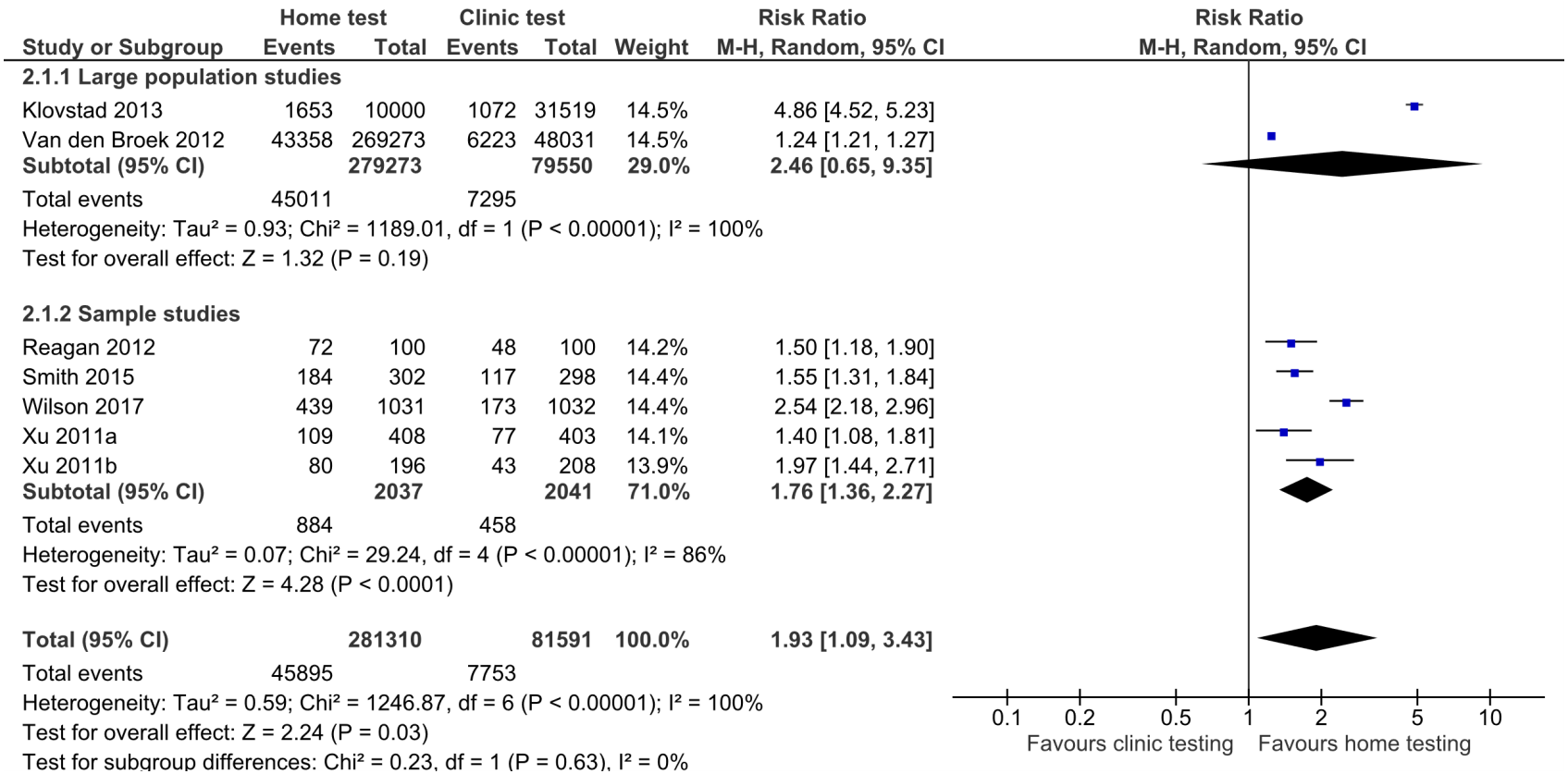
Critical appraisal - CASP qualitative checklist

Section	Question	Answer
Aims of the research	Was there a clear statement of the aims of the research?	Yes
Appropriateness of methodology	Is a qualitative methodology appropriate?	Yes
Research Design	Was the research design appropriate to address the aims of the research?	Yes
Recruitment Strategy	Was the recruitment strategy appropriate to the aims of the research?	Yes
Data collection	Was the data collected in a way that addressed the research issue?	Yes
Researcher and participant relationship	Has the relationship between researcher and participants been adequately considered?	Can't tell
Ethical Issues	Have ethical issues been taken into consideration?	Yes
Data analysis	Was the data analysis sufficiently rigorous?	Yes
Findings	Is there a clear statement of findings?	Yes
Research value	How valuable is the research?	The research is valuable
Overall risk of bias and relevance	Overall risk of bias	Low
Overall risk of bias and relevance	Relevance	Relevant *(Downgraded due to partial focus on HIV testing)*

Appendix E – Forest plots[a]

Remote self-sampling kit interventions vs. standard care testing in sexual health clinics

Figure 1: Remote self-sampling home test kits compared to standard testing in sexual health clinics for number of completed tests (RR <1 favours clinic testing, RR >1 favours home testing)



[a] Forest plots are only included for outcomes where meta-analysis was undertaken. Outcomes included in single studies do not have forest plots.

Figure 2: Remote self-sampling home test kits compared to standard testing in sexual health clinics for positive test results in the whole sample (RR <1 favours clinic testing, RR >1 favours home testing)

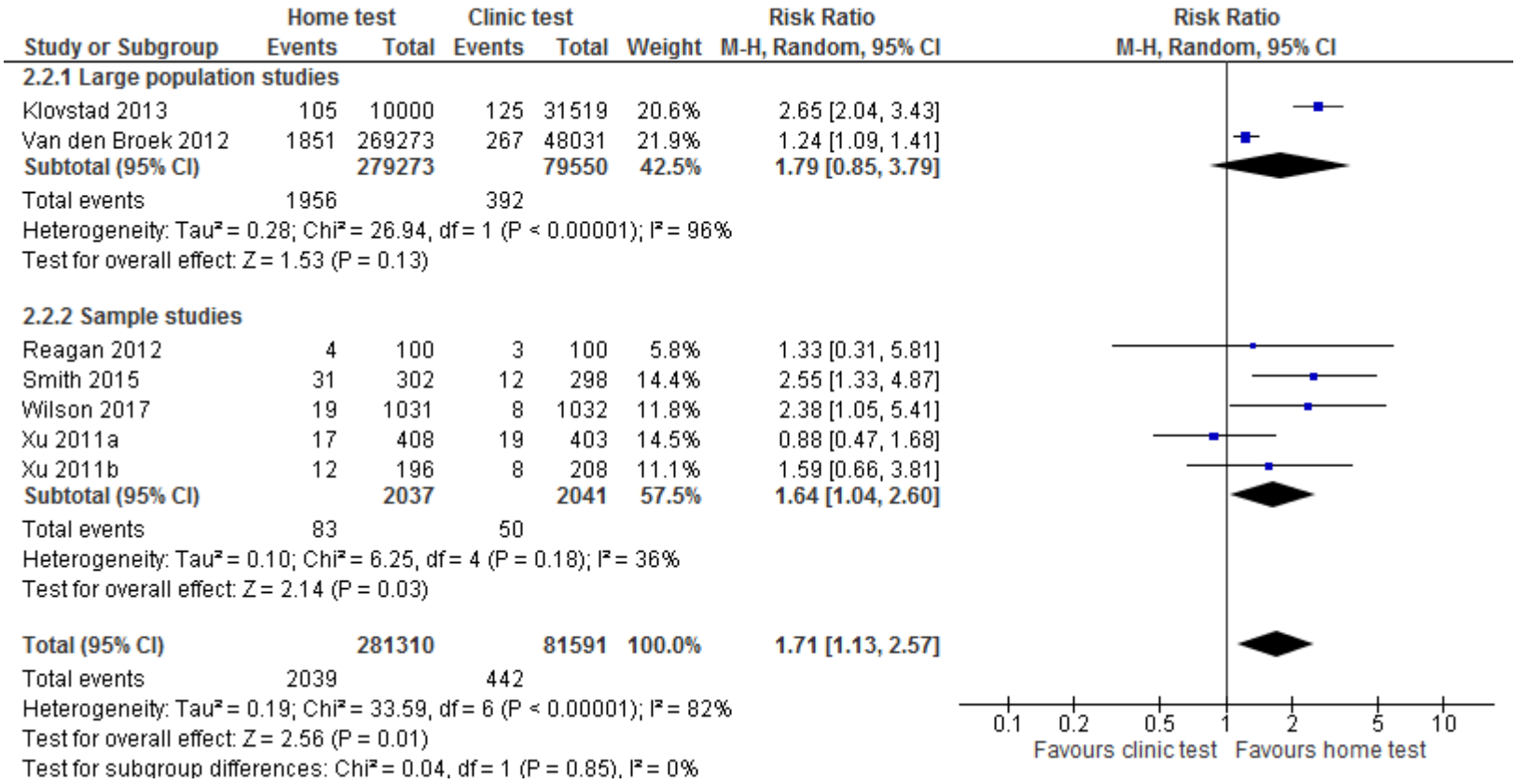
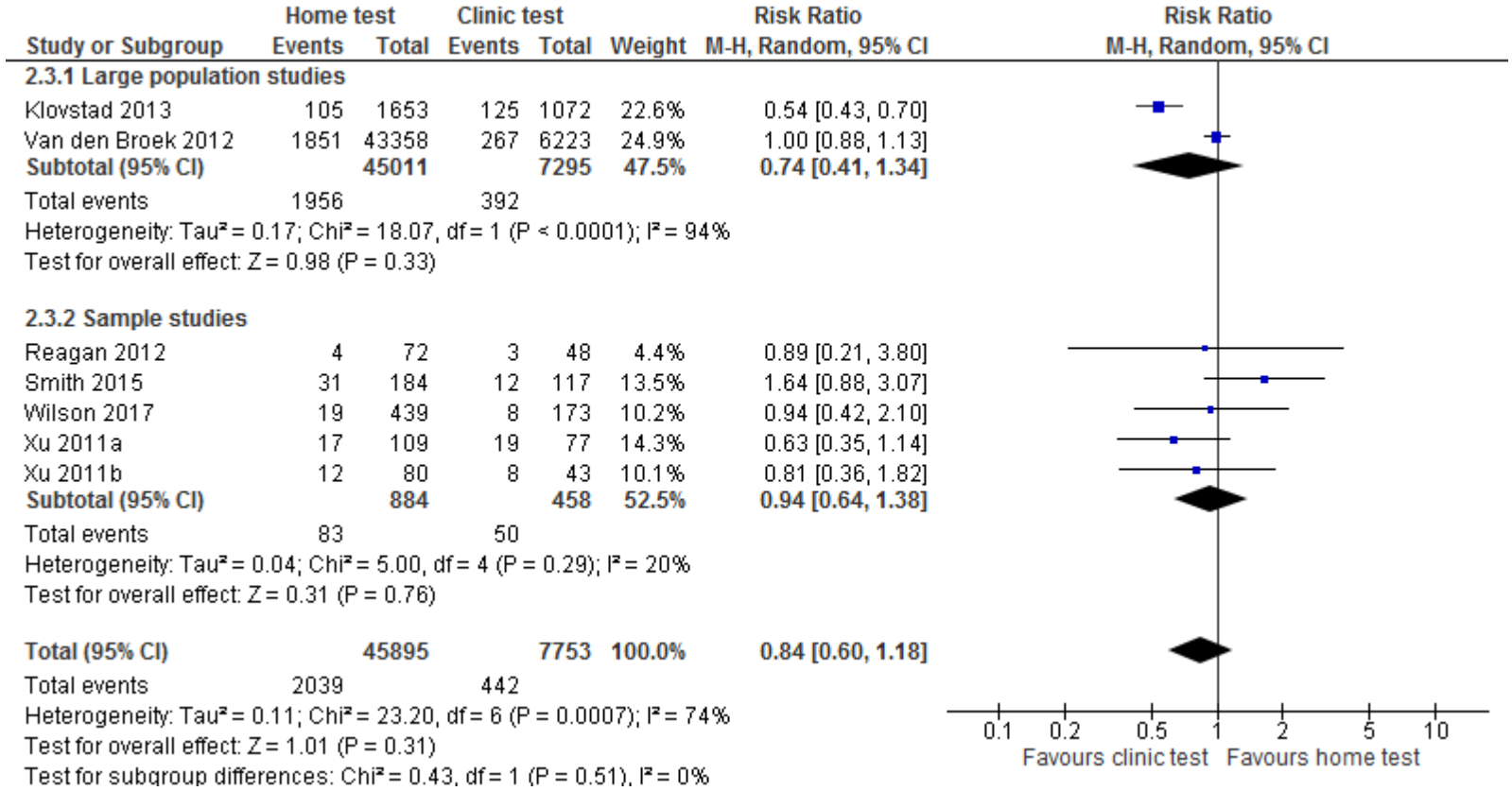
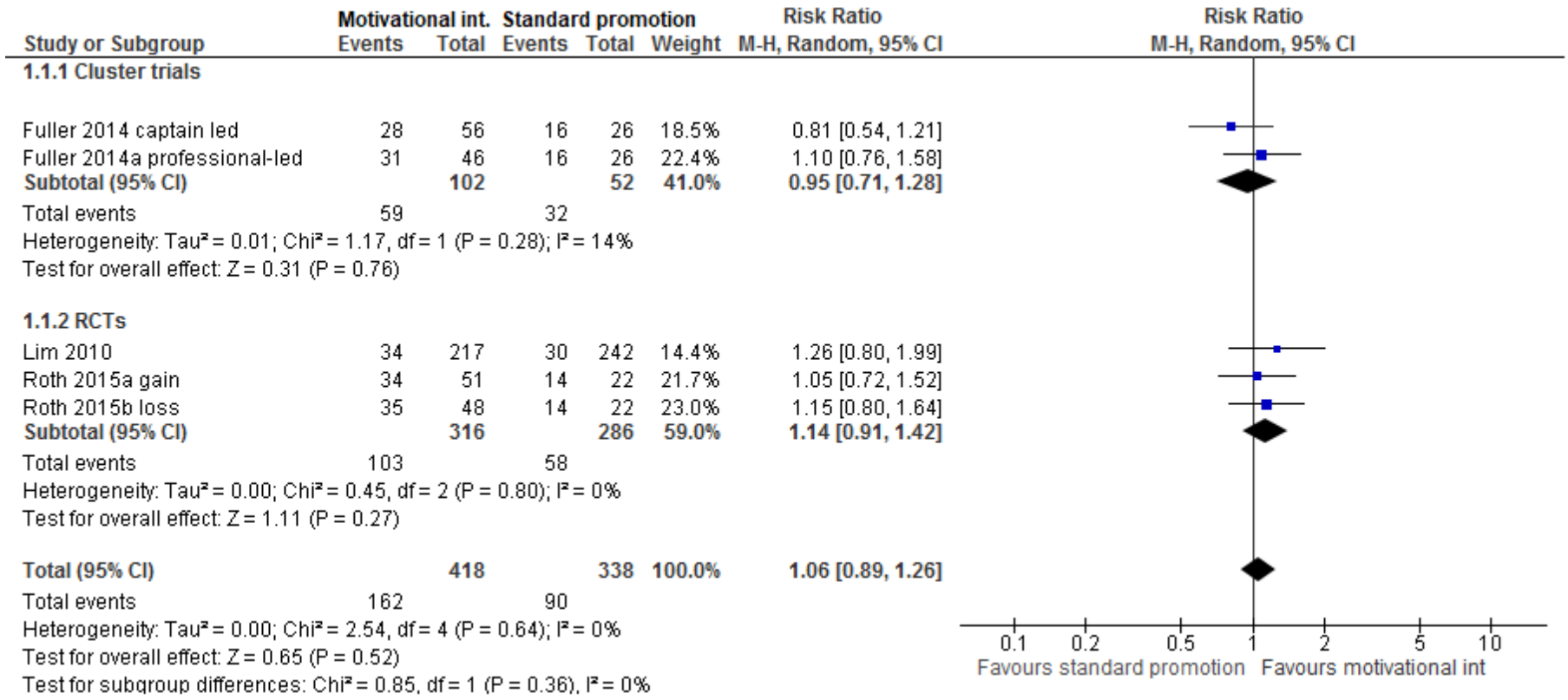


Figure 3: Remote self-sampling home test kits compared to standard testing in sexual health clinics for positive test results from those who completed a test (RR <1 favours clinic testing, RR >1 favours home testing)



Motivational interventions to increase STI testing

Figure 4: Interventions to increase motivation to test compared to standard promotion of testing for number of completed tests (RR <1 favours standard promotion, RR >1 favours motivational interventions)



Tailored interventions to increase STI testing

Figure 5: Tailored interventions compared to non-tailored interventions of testing for number of completed tests (RR <1 favours non-tailored interventions, RR >1 favours tailored interventions)

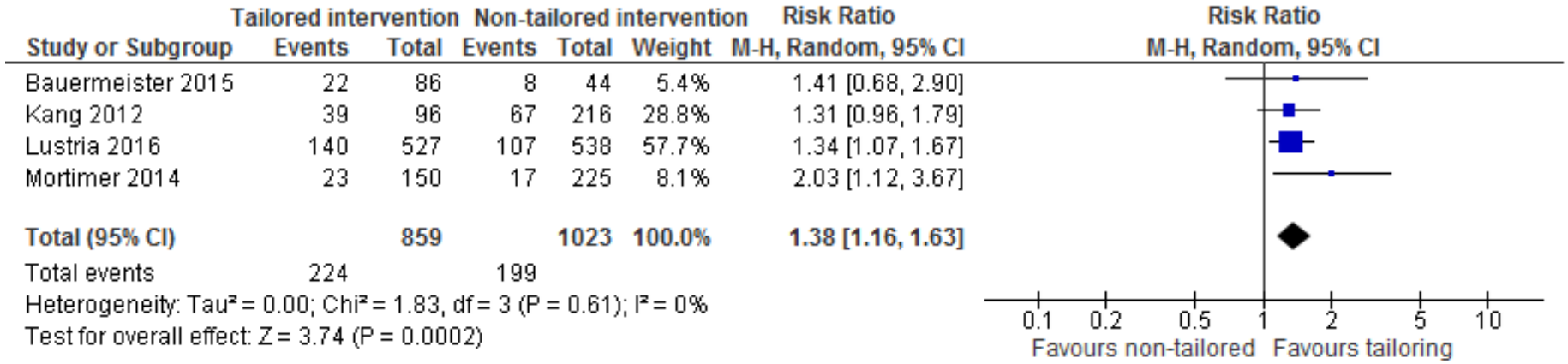
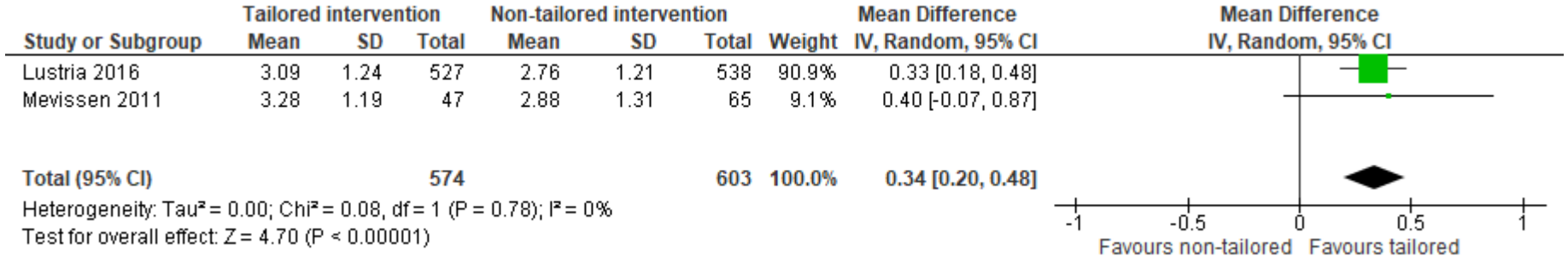


Figure 6: Tailored interventions compared to non-tailored interventions of testing for intention to get tested (RR <1 favours non-tailored interventions, RR >1 favours tailored interventions)



Clinic interventions to increase STI testing

Figure 7: Computer assisted clinic interview compared to standard pen-and-paper interview on number of tests completed (RR <1 favours pen and paper, RR >1 computer assisted)

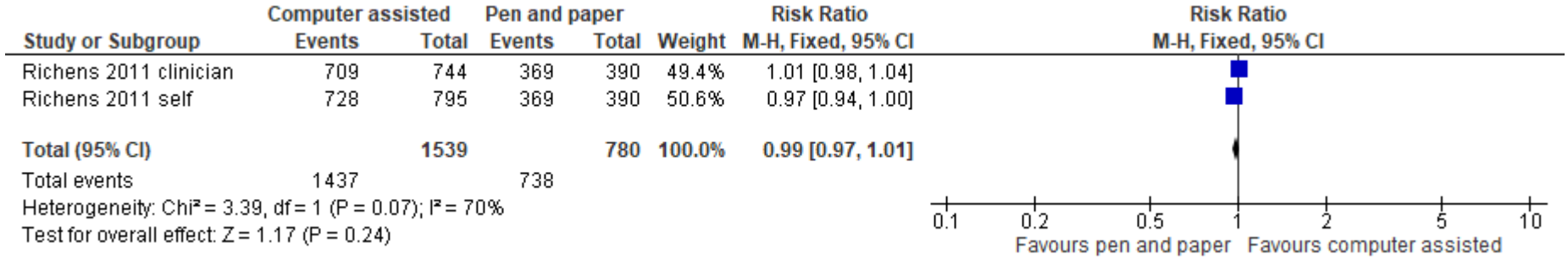
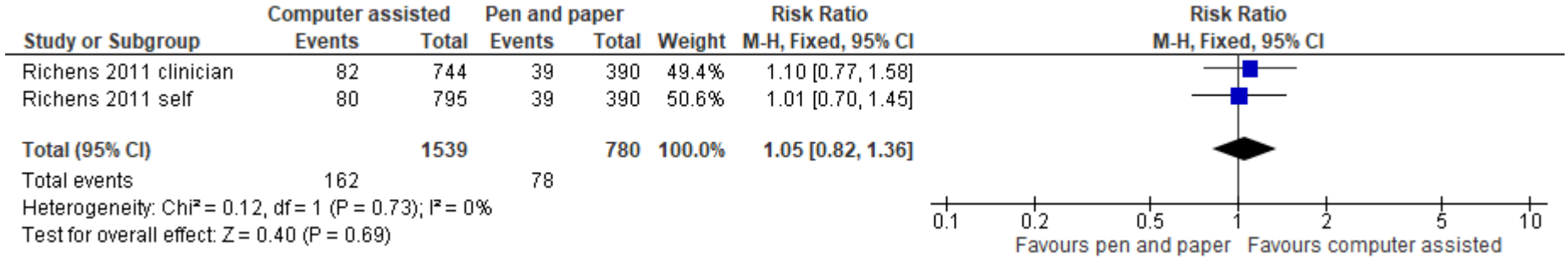


Figure 8: Computer assisted clinic interview compared to standard pen-and-paper interview on number of positive test results (RR <1 favours pen and paper, RR >1 computer assisted)



Appendix F – GRADE and GRADE-CERQual tables

GRADE tables

Table 1: Remote self-sampling vs clinic tests for Increasing uptake of STI testing

Quality assessment							No of patients		Effect		Quality
No of studies	Design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	Home	Clinic tests	Relative (95% CI)	Absolute	
Tests taken (assessed with: number of participants who completed STI testing)											
6[1,2,3,4,5,6]	randomised trials	no serious risk of bias	very serious[7]	very serious[8]	serious[12]	none	45895/281310 (16.3%)	7753/81591 (9.5%)	RR 1.93 (1.09 to 3.43)	88 more per 1000 (from 9 more to 231 more)	⊕OOO VERY LOW
								19.1%		178 more per 1000 (from 17 more to 464 more)	
Tests taken - Large population studies (assessed with: number of participants who completed STI testing)											
2[1,4]	randomised trials	very serious[9]	very serious[7]	very serious[10]	very serious[14]	none	45011/279273 (16.1%)	7295/79550 (9.2%)	RR 2.46 (0.65 to 9.35)	134 more per 1000 (from 32 fewer to 766 more)	⊕OOO VERY LOW
								8.2%		120 more per 1000 (from 29 fewer to 685 more)	
Tests taken - Sample studies (assessed with: number of participants who completed STI testing)											
4[2,3,5,6]	randomised trials	no serious risk of bias	very serious[7]	serious[11]	no serious imprecision	none	884/2037 (43.4%)	458/2041 (22.4%)	RR 1.76 (1.36 to 2.27)	171 more per 1000 (from 81 more to 285 more)	⊕OOO VERY LOW
								20.7%		157 more per 1000 (from 75 more to 263 more)	
STIs detected (assessed with: number of positive results)											
6[1,2,3,4,5,6]	randomised trials	no serious risk of bias	very serious[7]	very serious[8]	serious[12]	none	2039/281310 (0.7%)	442/81591 (0.5%)	RR 1.71 (1.13 to 2.57)	4 more per 1000 (from 1 more to 9 more)	⊕OOO VERY LOW
								3%		21 more per 1000 (from 4 more to 47 more)	
STIs detected - Large population studies (assessed with: number of positive results)											
2[1,4]	randomised trials	very serious[9]	very serious[7]	very serious[10]	serious[12]	none	1956/279273 (0.7%)	392/79550 (0.5%)	RR 1.79 (0.85 to 3.79)	4 more per 1000 (from 1 fewer to 14 more)	⊕OOO VERY LOW
								0.5%		4 more per 1000 (from 1 fewer to 14 more)	
STIs detected - Sample studies (assessed with: number of positive results)											
4[2,3,5,6]	randomised trials	no serious risk of bias	very serious[7]	serious[11]	serious[12]	none	83/2037 (4.1%)	50/2041 (2.4%)	RR 1.64 (1.04 to 2.6)	16 more per 1000 (from 1 more to 39 more)	

								3.9%		25 more per 1000 (from 2 more to 62 more)	⊕OOO VERY LOW
STIs diagnosed from tests taken (assessed with: number of positive results)											
6[1,2,3,4,5,6]	randomised trials	no serious risk of bias	very serious[7]	very serious[8]	serious[12]	none	2039/45895 (4.4%)	442/7753 (5.7%)	RR 0.84 (0.6 to 1.18)	9 fewer per 1000 (from 23 fewer to 10 more)	⊕OOO VERY LOW
								10.3%		16 fewer per 1000 (from 41 fewer to 19 more)	
STIs diagnosed from tests taken - Large population studies (assessed with: number of positive results)											
2[1,4]	randomised trials	very serious[9]	very serious[7]	very serious[10]	Very serious[14]	none	1956/45011 (4.3%)	392/7295 (5.4%)	RR 0.74 (0.41 to 1.34)	14 fewer per 1000 (from 32 fewer to 18 more)	⊕OOO VERY LOW
								8%		21 fewer per 1000 (from 47 fewer to 27 more)	
STIs diagnosed from tests taken - Sample studies (assessed with: number of positive results)											
4[2,3,5,6]	randomised trials	no serious risk of bias	Serious[13]	serious[11]	very serious[14]	none	83/884 (9.4%)	50/458 (10.9%)	RR 0.94 (0.64 to 1.38)	7 fewer per 1000 (from 39 fewer to 41 more)	⊕OOO VERY LOW
								10.3%		6 fewer per 1000 (from 37 fewer to 39 more)	

[1] Klovstad 2013
[2] Reagan 2012
[3] Smith 2015
[4] Van den Broek 2012
[5] Wilson 2017 & 2019
[6] Xu 2011
[7] Downgraded twice because of significant heterogeneity (I^2 > 75%)
[8] Downgraded twice for 2 indirectly applicable studies and 3 partially appliable studies
[9] Downgraded twice for 1 study with high risk of bias and 1 study with some concerns
[10] Downgraded twice for 1 indirectly applicable study and 1 partially appliable study
[11] Downgraded once for 2 partially applicable studies and 1 indirectly applicable study
[12] Downgraded once for crossing one MID/line of no effect
[13] Downgraded once for inconsistency i^2 > 50%
[14] Downgraded twice for crossing two MIDs

Table 2: Motivational approaches for increasing uptake of STI testing

Quality assessment							No of patients		Effect		Quality
No of studies	Design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	Motivation	Control	Relative (95% CI)	Absolute	
Tests (assessed with: number of participants who completed STI testing)											
3[1,2,3]	randomised trials	very serious[4]	no serious inconsistency	no serious indirectness	serious[5]	none	162/418 (38.8%)	90/338 (26.6%)	RR 1.06 (0.89 to 1.26)	16 more per 1000 (from 29 fewer to 69 more)	⊕OOO VERY LOW
								61.5%		37 more per 1000 (from 68 fewer to 160 more)	
Tests - Cluster trials (assessed with: number of participants who completed STI testing)											
1[1]	randomised trials	very serious[6]	not applicable	no serious indirectness	very serious[10]	none	59/102 (57.8%)	32/52 (61.5%)	RR 0.95 (0.71 to 1.28)	31 fewer per 1000 (from 178 fewer to 172 more)	⊕OOO VERY LOW
								61.5%		31 fewer per 1000 (from 178 fewer to 172 more)	
Tests - RCTs (assessed with: number of participants who completed STI testing)											
2[2,3]	randomised trials	serious[7]	no serious inconsistency	no serious indirectness	serious[5]	none	103/316 (32.6%)	58/286 (20.3%)	RR 1.14 (0.91 to 1.42)	28 more per 1000 (from 18 fewer to 85 more)	⊕⊕OO LOW
								63.6%		89 more per 1000 (from 57 fewer to 267 more)	
Intention to get tested (measured with: 7 point scale; range of scores: 1-7; Better indicated by higher values [MID:0.85])											
1[8]	randomised trials	no serious risk of bias	not applicable	serious[9]	no serious imprecision	none	145	108	-	MD 0.42 higher (0.84 lower to 0 higher)	⊕⊕⊕O MODERATE
Attitude towards testing (measured with: 7 point scale; range of scores: 1-7; Better indicated by higher values [MID:0.65])											
1[8]	randomised trials	no serious risk of bias	no serious inconsistency	serious[9]	no serious imprecision	none	145	108	-	MD 0.42 higher (0.72 to 0.12 higher)	⊕⊕⊕O MODERATE
Condom use (follow-up 6 months; assessed with: number of 'always' responses)											
1[2]	randomised trials	very serious[6]	not applicable	no serious indirectness	serious[5]	none	23/217 (10.6%)	30/242 (12.4%)	RR 0.71 (0.44 to 1.16)	124 fewer per 1000 (from 124 fewer to 124 fewer)	⊕OOO VERY LOW
								0%		-	
Contact with a sexual health clinician (follow-up 6 months)											
1[2]	randomised trials	very serious[6]	not applicable	no serious indirectness	serious[5]	none	53/217 (24.4%)	51/242 (21.1%)	RR 1.16 (0.83 to 1.62)	211 fewer per 1000 (from 211 fewer to 211 fewer)	⊕OOO VERY LOW
								0%		-	

[1] Fuller 2014
[2] Lim 2010
[3] Roth 2015
[4] Downgraded twice for 2 studies with high risk of bias
[5] Downgraded once for crossing one MID/line of no effect

[6] Downgraded twice because all studies are high risk of bias
[7] Downgraded once for one study with high risk of bias
[8] Booth 2014
[9] Downgraded once because study indirectly applicable
[10] Downgraded twice for crossing both MIDs

Table 3: Tailored interventions for Increasing uptake of STI testing

Quality assessment							No of patients		Effect		Quality
No of studies	Design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	Tailoring	Control	Relative (95% CI)	Absolute	
Tests (assessed with: number of participants who completed STI testing)											
4[1,2,3,4]	randomised trials	serious[5]	no serious inconsistency	serious[6]	serious[7]	none	224/859 (26.1%)	199/1023 (19.5%)	RR 1.38 (1.16 to 1.63)	74 more per 1000 (from 31 more to 123 more)	⊕OOO VERY LOW
								19%		72 more per 1000 (from 30 more to 120 more)	
Intention to get tested (follow-up 0-3 months; measured with: mean survey responses; Better indicated by lower values [MID: 0.63])											
2[2,8]	randomised trials	serious[9]	no serious inconsistency	no serious indirectness	no serious imprecision	none	574	603	-	MD 0.34 higher (0.2 to 0.48 higher)	⊕⊕⊕O MODERATE
Intention to get tested (follow-up 2-6 months; assessed with: number who answered yes)											
1[1]	randomised trials	serious[11]	not applicable	no serious indirectness	serious[7]	none	32/150 (21.3%)	28/225 (12.4%)	RR 1.71 (1.08 to 2.72)	124 fewer per 1000 (from 124 fewer to 124 fewer)	⊕⊕OO LOW
								0%		-	
Attitude towards testing (follow-up 2-6 months; assessed with: number who answered that testing is relevant)											
1[1]	randomised trials	serious[11]	not applicable	no serious indirectness	serious[7]	none	34/150 (22.7%)	41/225 (18.2%)	-	182 fewer per 1000 (from 182 fewer to 182 fewer)	⊕⊕OO LOW
								0%		-	
Attitude towards testing (measured with: mean survey responses; range of scores: 1-5; Better indicated by higher values [MID:0.36])											
1[8]	randomised trials	serious[11]	not applicable	no serious indirectness	serious[7]	none	47	65	RR 1.24 (0.83 to 1.85)	0.4 higher (0.23 to 0.31 higher)	⊕⊕OO LOW
Condom use (follow-up 3 months; measured with: mean survey responses; range of scores: 0-2; Better indicated by higher values [MID:0.31])											
1[8]	randomised trials	serious[11]	not applicable	no serious indirectness	no serious imprecision	none	33	45	-	MD 0.26 higher (0.04 to 0.56 higher)	⊕⊕⊕O MODERATE
Contact with sexual health clinician (follow-up 2-6 months; assessed with: number who answered yes)											
1[1]	randomised trials	serious[11]	not applicable	no serious indirectness	serious[7]	none	46/150 (30.7%)	42/225 (18.7%)	RR 1.6 (1.1 to 2.4)	112 more per 1000 (from 19 more to 261 more)	⊕⊕OO LOW
								0%		-	

[1] Mortimer 2014
[2] Lustria 2016

[3] Kang 2012
[4] Bauermeister 2015
[5] Downgraded once for 3 studies with some concerns and 1 study with high risk of bias
[6] Downgraded once for 1 partially applicable study and 1 indirectly applicable study
[7] Downgraded once for confidence intervals that cross one MID/line of no effect
[8] Mevission 2014
[9] Downgraded once because both studies have some concerns for risk of bias
[10] Downgraded once for large confidence intervals that cross the line of no effect
[11] Downgraded once for some concerns about risk of bias
[12] Downgraded once for large confidence intervals

Table 4: Computer assisted interview for increasing uptake of STI testing within sexual health clinics

Quality assessment							No of patients		Effect		Quality	Importance
No of studies	Design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	Clinic interventions	Control	Relative (95% CI)	Absolute		
Number of tests completed (assessed with: number of participants who completed STI testing)												
1[1]	randomised trials	serious[2]	no serious inconsistency	no serious indirectness	Very serious[4]	none	1437/1539 (93.4%)	738/780 (94.6%)	RR 0.99 (0.97 to 1.01)	9 fewer per 1000 (from 28 fewer to 9 more)	⊕OOO VERY LOW	
								94.6%		9 fewer per 1000 (from 28 fewer to 9 more)		
Positive results (assessed with: number of participants with positive STI results)												
1	randomised trials	serious[2]	no serious inconsistency	no serious indirectness	very serious[4]	none	162/1539 (10.5%)	78/780 (10%)	RR 1.05 (0.82 to 1.36)	5 more per 1000 (from 18 fewer to 36 more)	⊕OOO VERY LOW	
								10%		5 more per 1000 (from 18 fewer to 36 more)		

[1] Richens (2011)

[2] Downgraded once for risk of bias for all studies having some concerns

[3] Downgraded once for confidence intervals that cross one MID/line of no effect

[4] Downgraded twice, once for large confidence intervals and once for confidence intervals that cross one MID/line of no effect

GRADE CERQual tables

Summary of review finding	Studies	Methodological limitations	Relevance	Coherence	Adequacy	Confidence
Reasons for testing						
Most participants accepted testing for peace of mind. They did so opportunistically, when they would not have sought out a sexual health clinic but valued the reassurance.	Estcourt 2016 Powell 2016 Wayal 2011	No concerns	No concerns	No concerns	Minor concerns[7]	Moderate
Few participants tested because of their sexual health risk status. Many had little knowledge of STIs and no awareness of their own risk and so were not driven to test by their perception of their risk status. Despite this, there were mixed opinions on providing education alongside the interventions. Some took the opportunity to ask questions, but others found it off-putting.	Estcourt 2016 Fleming 2020 Fuller2019 Hogan 2010 Jackson 2021 Jones 2017 Loaring 2013 Normansell 2015 Wayal 2011	No concerns	No concerns	Moderate concerns[6]	No concerns	Low
Many participants reported testing in order to receive an incentive. However, this acted as a facilitator to getting tested, but rather than it being because they wanted the reward, it was because participants felt they could avoid stigma by claiming they were taking part to gain the incentive rather than admitting to wanting to be tested.	Powell 2016 Loaring 2013 Fleming 2020	Minor concerns[1]	Minor concerns[3]	No concerns	Minor concerns[7]	Moderate
Accessibility of self-sampling to people with mild learning disabilities						
Participants with mild learning disabilities lacked confidence with testing and wanted support. Most participants with MLDs had little existing knowledge or understanding of STI testing.	Middleton 2021	No concerns	No concerns	No concerns	Minor concerns[7]	Moderate

Summary of review finding	Studies	Methodological limitations	Relevance	Coherence	Adequacy	Confidence
Participants felt anxious and overwhelmed by trying to follow the test kit's instructions and did not feel confident approaching the task. Many said that they would want support to use the kit, and most of these participants preferred to get help from a GP or support worker.						
Participants with mild learning disabilities had difficulty understanding the test instructions. They found the written instructions too long and difficult to read. The diagrams were helpful for some, but others struggled to interpret the anatomic sites they showed. They suggested ways that this could be improved, in particular they felt that YouTube videos demonstrating the kits would be easier to follow.	Middleton 2021	No concerns	No concerns	No concerns	Minor concerns[7]	Moderate
Participants with mild learning disabilities found it difficult to use the test kit. Some participants had problems with motor skills and manual dexterity, which made it difficult to take blood samples. Some women did not have enough knowledge of their genitalia to complete the test. Participants were also concerned that the tests would not be effective if they did not complete them correctly.	Middleton 2021	No concerns	No concerns	No concerns	Minor concerns[7]	Moderate
Intervention quality and practicalities						

Summary of review finding	Studies	Methodological limitations	Relevance	Coherence	Adequacy	Confidence
Participants were concerned about data security. This made them cautious about disclosing personal information without knowing why it is needed and how it will be used.	Aicken 2016 Fleming 2020 Gkatzidou1 2015	No concerns	Minor concerns[3]	No concerns	No concerns	Moderate
Several participants questioned the accuracy of tests used outside of clinic settings. More specifically, some were concerned that the tests were able to be distributed widely because they were cheaper and therefore possibly poorer quality. Some participants also expressed distrust of 'faceless' healthcare and were concerned about the expertise of the people involved in the testing program.	Wayal 2011 Powell 2016 Jones 2017 Gkatzidou1 2015 Estcourt 2016a Aicken 2016	No concerns	No concerns	No concerns	No concerns	High
Participants had some concerns about the practicalities of the proposed interventions. They felt that rapid testing would not be as fast in reality if there is high demand to use the service. Those using home tests were concerned that the software might be unreliable or that their samples could be damaged or lost in the post.	Wayal 2011 Powell 2016 Fuller2019 Aicken 2016	No concerns	Minor concerns[3]	No concerns	No concerns	Moderate
Design and credibility of the intervention						
Visibility, familiarity and advertising increased trust in the service. Participants	Wayal 2011 Loaring 2013 Jones 2017 Hogan 2010	No concerns	Minor concerns[3]	No concerns	No concerns	Moderate

Summary of review finding	Studies	Methodological limitations	Relevance	Coherence	Adequacy	Confidence
felt were more willing to use a well-known and established testing program. Association with the NHS was frequently mentioned as an indicator of credibility.	Gkatzidou1 2015 Estcourt 2016b Estcourt 2016a Aicken 2016					
Aesthetics, language, and design appeal influenced how participants felt about the intervention. Young people wanted language that appealed to them, but were critical of attempts to appear 'cool' which they found patronising. They considered a professional looking design to be more appropriate and give the impression of taking their health seriously as an adult issue.	Lorimer 2013 Gkatzidou1 2015 Estcourt 2016b	No concerns	No concerns	No concerns	No concerns	High
Participants wanted to access testing using technology that fulfilled their needs and matched their preferences. Some wanted specific features such as reminders and others were particular about which platforms were best suited to delivering the intervention. Many were not willing to download a phone app for a single purpose.	Fleming 2020 Gkatzidou1 2015 Lorimer 2013 Middleton 2021 Normansell 2015	No concerns	No concerns	No concerns	No concerns	High
The experience of using the test						
Convenience was frequently mentioned as one of the main benefits of these interventions. Using self test kits and making tests available in different settings enabled participants to access testing with minimal effort; they commented that they may not have scheduled a clinic visit but	Wayal 2011 Powell 2016 Normansell 2015 Lorimer 2013 Jones 2017 Jackson 2021	No concerns	No concerns	No concerns	No concerns	High

Summary of review finding	Studies	Methodological limitations	Relevance	Coherence	Adequacy	Confidence
were happy to take a quick test in their own time.	Hogan 2010 Fuller2019 Estcourt 2016b Estcourt 2016a Aicken 2016					
Speed was an important aspect for many participants. Most preferred a faster test with faster results. Some, however, were concerned that there would be a balance between speed and accuracy, in which case they would prefer a more accurate test to a fast one. For participants who were asked about rapid point-of-care tests, the speed felt paradoxical: They were pleased to have their results faster, within an hour rather than a few days, however this meant a longer clinic visit was needed to allow time for that 30 minute wait. Some did find this acceptable as long as they were informed in advance and given a choice.	Aicken 2016 Estcourt 2016b Fuller2019 Jackson 2021 Loaring 2013 Normansell 2015 Wayal 2011	No concerns	Minor concerns[3]	Minor concerns[5]	No concerns	Moderate
Many participants described self-test kits as easy to use. They felt confident that they had administered the test correctly and that the procedure for returning samples was simple and straightforward.	Aicken 2016 Estcourt 2016a Estcourt 2016b Jones 2017 Loaring 2013 Powell 2016 Wayal 2011	No concerns	No concerns	No concerns	No concerns	High
Some participants felt anxiety about sexual health screening, both with and	Estcourt 2016a Estcourt 2016b	No concerns	No concerns	No concerns	No concerns	High

Summary of review finding	Studies	Methodological limitations	Relevance	Coherence	Adequacy	Confidence
without the interventions. Some anxiety was about the experience of testing, but most focused on worries about receiving the results and how they would react to a positive test. Several participants stated that they would avoid testing until symptoms worsened.	Hogan 2010 Jackson 2021 Loaring 2013 Normansell 2015 Powell 2016					
Some participants expressed a desire for more control and choice in their screening experiences. There was anxiety about the invasive nature of some clinic tests and both the social and physical discomfort of being examined. These participants found self-test kits more acceptable as they allowed them to avoid this experience. Some participants also wanted a choice in the type of self test, as they would feel more comfortable giving a urine sample instead of a swab. Some participants did not feel like they were able to refuse or ask for different test options.	Estcourt 2016a Fuller2019 Jackson 2021 Jones 2017 Powell 2016 Richardson 2010	No concerns	No concerns	No concerns	No concerns	High
Confidentiality and stigma						
Participants highly valued a confidential and anonymous service. This was often described as a crucial element of any intervention or test service. Home test kits were particularly praised for allowing participants to test with no face-to-face interaction.	Aicken 2016 Estcourt 2016a Estcourt 2016b Fleming 2020 Jackson 2021 Jones 2017 Lorimer 2013 Powell 2016 Wayal 2011	No concerns	No concerns	No concerns	No concerns	High

Summary of review finding	Studies	Methodological limitations	Relevance	Coherence	Adequacy	Confidence
The ability to conceal testing from others was important. Participants did not want to be seen taking or returning test kits or to have their results returned in a format that others could access. Several participants stated that their phones and post were not private.	Aicken 2016 Estcourt 2016a Fleming 2020 Gkatzidou1 2015 Hogan 2010 Jackson 2021 Jones 2017 Loaring 2013 Powell 2016 Richardson 2010	No concerns	No concerns	No concerns	No concerns	High
Many participants were concerned about embarrassment. The stigma of STIs most commonly manifested as humiliating or shameful to be associated with, so even asymptomatic testing required courage to be seen doing. Young people were particularly worried about their parents finding out they took a test, as many had not told their parents about their sexual activity.	Aicken 2016 Estcourt 2016a Estcourt 2016b Fleming 2020 Gkatzidou1 2015 Hogan 2010 Jackson 2021 Jones 2017 Loaring 2013 Lorimer 2013 Normansell 2015 Powell 2016 Richardson 2010	No concerns	No concerns	No concerns	No concerns	High
Participants were concerned that people may make inferences about their sexual	Aicken 2016 Estcourt 2016a	No concerns	No concerns	Minor concerns[5]	No concerns	Moderate

Summary of review finding	Studies	Methodological limitations	Relevance	Coherence	Adequacy	Confidence
behaviour. They feared being judged as 'unclean' or 'slutty'. Some participants applied these views to others who use sexual health services. Participants also said that they would react negatively if their partner accepted a test and believed their partner would do likewise.	Fleming 2020 Hogan 2010 Jones 2017 Lorimer 2013 Normansell 2015 Powell 2016 Richardson 2010 Wayal 2011					
Gender performativity can increase or decrease stigma. Some young men used humour to enforce norms of rejecting testing. Adult men counteracted stigma by encouraging a 'lads together' approach to normalise testing while emphasising masculinity. MSM felt a particular need for privacy due to homophobia.	Estcourt 2016a Estcourt 2016b Fleming 2020 Loaring 2013 Wayal 2011	No concerns	No concerns	No concerns	No concerns	High
Involvement of healthcare professionals						
Face to face interaction influences how comfortable participants feel about testing. Some participants felt judged and uncomfortable seeking testing from clinic staff so preferred to avoid interaction. Others were encouraged to test by interacting with providers who had a rapport and familiarity with them.	Estcourt 2016a Hogan 2010 Jones 2017 Middleton 2021 Normansell 2015	No concerns	Minor concerns[3]	Moderate concerns[6]	No concerns	Low
Participants valued personal support from a healthcare provider. This was particularly important when receiving test results. They felt they would not know what	Aicken 2016 Estcourt 2016b Hogan 2010 Jones 2017	No concerns	No concerns	No concerns	No concerns	High

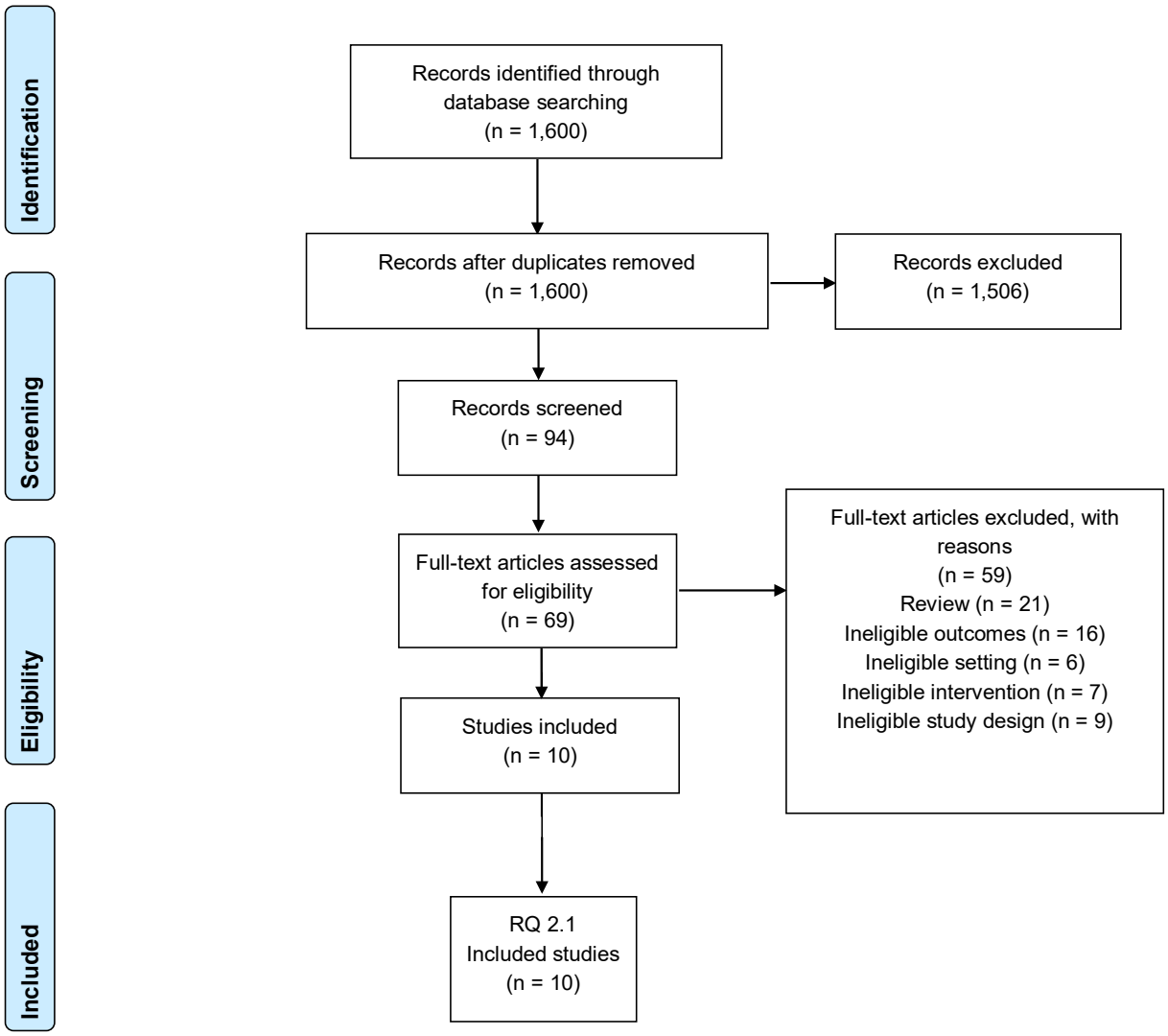
Summary of review finding	Studies	Methodological limitations	Relevance	Coherence	Adequacy	Confidence
to do about a positive result on their own and would want to have it explained to them so they could ask questions and seek reassurance.	Powell 2016 Wayal 2011					
Some participants felt they needed a healthcare professional's involvement for practical assistance and clarification. Participants who used a self test kit that involved a questionnaire sometimes did not understand the questions or could not give a straightforward answer to them. Some participants also did not feel confident administering the test themselves.	Estcourt 2016b Gkatzidou1 2015 Hogan 2010 Jones 2017 Middleton 2021 Powell 2016 Wayal 2011	No concerns	No concerns	Minor concerns[5]	No concerns	Moderate
Where the tests are available						
Some participants preferred to receive sexual health services within a medical setting. They felt GP surgeries were the appropriate place to be offered a health intervention and they had an established trusting relationship with the staff. Medical expertise was seen as the key advantage accessing tests here rather than community settings.	Aicken 2016 Hogan 2010 Jones 2017 Loaring 2013 Wayal 2011	No concerns	Minor concerns[3]	Minor concerns[5]	No concerns	Moderate
Participants appreciated being offered testing in social community spaces. It was seen as more convenient to take the opportunity as it was offered than to seek out testing. The presence of friends often acted as a facilitator to testing in social spaces, as testing together as a group removed the	Estcourt 2016a Estcourt 2016b Fleming 2020 Gkatzidou1 2015 Hogan 2010 Loaring 2013 Powell 2016 Wayal 2011	No concerns	No concerns	Minor concerns[5]	No concerns	Moderate

Summary of review finding	Studies	Methodological limitations	Relevance	Coherence	Adequacy	Confidence
embarrassment of making an individual decision to test. Young women in particular often encouraged each other to take a test.						
Self tests were well reviewed by most who used them. There was a lot of general enthusiasm about the option to complete a test at home. Participants felt that the privacy and control over the situation removed a lot of the barriers they associated with other test locations.	Aicken 2016 Fleming 2020 Jones 2017 Loaring 2013 Lorimer 2013 Normansell 2015 Wayal 2011	No concerns	Minor concerns[3]	No concerns	No concerns	Moderate
Some participants preferred sexual health clinics and felt that testing in other settings was not appropriate. In some social spaces, sexual health interventions can feel 'preachy' or serve as an unwelcome reminder of poor health. In GP surgeries, some participants felt patronised by being profiled for a test when they wanted to use their appointment time to discuss a different medical issue. Some felt that where to test depended on the context for wanting a test. They were happy to use the intervention services for asymptomatic routine testing, but would want the full clinic experience if they had symptoms or believed themselves to be at risk.	Estcourt 2016b Fleming 2020 Fuller2019 Jones 2017 Lorimer 2013 Normansell 2015 Powell 2016 Wayal 2011	No concerns	No concerns	No concerns	No concerns	High

1. Finding was downgraded once because it was identified mainly in studies at moderate or high risk of bias
2. Finding was downgraded twice because it was identified mainly in studies at high risk of bias
3. Finding was downgraded once because it was identified mainly in studies that were indirectly or partially relevant
4. Finding was downgraded twice because it was identified mainly in studies that were partially relevant

5. Finding was downgraded once for coherence because the theme did not emerge from all relevant studies, findings were somewhat conflicting, or there was little convincing theoretical explanation
6. Finding me was downgraded twice for coherence because the theme did not emerge from all relevant studies, findings were directly conflicting, or there was no convincing theoretical explanation
7. Finding was downgraded once for adequacy because of insufficient studies (fewer than 3) or insufficient detail
8. Finding was downgraded twice for adequacy because of both insufficient studies (fewer than 3) and insufficient detail

Appendix G – Economic evidence study selection



Appendix H – Economic evidence tables

Bracebridge (2012)						
Study	**Method of Analysis**	**Costs**	**Outcomes**	**Results**	**Limitations**	**Comments**
Study type: Cost-effectiveness evaluation of a chlamydia trachomatis screening service using global dispatch of testing kits, web-based data collection and test reporting, and treatment dispatch by post. **Country:** UK **Population:** Individuals aged 18-24 years who were registered to a general practice within the geographical boundary of the North East Essex Primary Care Trust (NEEPCT), between 1 December 2008 and 31 January 2009.	**Perspective:** UK NHS **Time horizon:** 1 year **Discounting:** None **Data sources Costs:** NCSP in 2008-9[b] and assumptions **Effects:** North East Essex (NEE) Primary Care Trust chlamydia screening service and National Chlamydia Screening Programme (NCSP) **Utilities:** NA	**Probabilistic results** **Cost of screening and partner notification for NEEPCT with set up costs (£):** 268,198 **Cost of screening and partner notification for NEEPCT without set up costs (£):** 238,686 **Cost of screening and partner notification for NCSP (£):** 46,300,000 **Currency & cost year:** UK£;2008-9	**Probabilistic results** **Number screened and diagnosed (%):** NEEPCT: 152 (4.4) NCSP: 72,570 (7.4) **Number of partners notified:** NEEPCT: 26 NCSP: 29028 **Partner notification efficacy:** NEEPCT: 0.17 NSCP: 0.4 **Test positivity (combined partner and screen):** NEEPCT: 4.4 NCSP: 9	**Probabilistic results** The cost per positive diagnosis was higher for the NEEPCT programme (£1,746) compared to the existing NSCP (£506). The cost per screening test and per positive diagnosis are 1.66 and 3.5 times higher for the NEEPCT than the NCSP average, respectively. **PSA** Not conducted. **Uncertainty:** Sensitivity analyses was not carried out.	**Author identified:** Analyses was limited to data on sex, age and IMD for the predictors of test uptake. IMD scores are derived from postcodes, and therefore, any incorrect assignment of postcode to an individual could bias these analyses. **Reviewer identified:** The study used simplistic costing that does not consider factors such as the cost savings from preventing STI transmission. Sensitivity analysis was not conducted.	**Source of funding:** Not reported **Further research:** The authors did not specify any areas for future research.

Bracebridge (2012)						
Study	**Method of Analysis**	**Costs**	**Outcomes**	**Results**	**Limitations**	**Comments**
Population size: Postal kits were distributed to 29, 917 individuals. Of whom 3,431 registered for screening. **Intervention:** Between 1 December 2008 and 31 January 2009 eligible individuals were sent a chlamydia screening kit by post with an explanation on how they could register to accept screening and send their samples to the laboratory. Participants who tested positive were then contacted by their preferred method and given the option to have their treatment posted or picked up from a local pharmacy.						

Bracebridge (2012)						
Study	**Method of Analysis**	**Costs**	**Outcomes**	**Results**	**Limitations**	**Comments**
Comparator(s): The National Chlamydia Screening Programme (NCSP) in 2008-2009.						
Overall applicability: Applicable **Overall quality: Minor limitations**						
Abbreviations: IMD: Index of Multiple Deprivation; NAAT: Nucleic Acid Amplification Tests; NCSP: National Chlamydia Screening Programme; NEEPCT: North East Essex Primary Care Trust; NHS: National Health Service; UK: United Kingdom						
a. Van Der Pol B, Ferrero DV, Buck-Barrington L, et al. Multicenter evaluation of the BDProbeTec ET System for detection of Chlamydia trachomatis and Neisseria gonorrhoeae in urine specimens, female endocervical swabs, and male urethral swabs. J Clin Microbiol 2001;39:1008e16.						
b. Turner K, Adams E, Grant A, et al. Costs and cost effectiveness of different strategies for chlamydia screening and partner notification: an economic and modelling study. BMJ 2011;342:c7250.						

Jackson 2015						
Study	**Method of Analysis**	**Costs**	**Outcomes**	**Results**	**Limitations**	**Comments**
Study type: Preliminary cost-consequence analysis to compare the cost and outcomes of captain-led, sexual health advisor-led and poster STI screening promotion among men in football clubs in England. **Country:** UK	**Perspective:** UK NHS **Time horizon:** Not reported **Discounting:** NA **Data sources Costs:** Unit costs of Health and Social Care 2013 **Effects:** Trial	**Probabilistic results** **Total cost of intervention (£):** **Captain-led:** 2491.61 **Health advisor-led:** 2738.09 **Poster-only:** 2538.09 **Average cost of player screened (£):** **Captain-led:** 88.99	**Probabilistic results** **Number of players tested:** **Captain-led:** 28 **Health advisor-led:** 31 **Poster-only:** 31 **Percent of players accepting screening offer:** **Captain-led:**	**Probabilistic results** The results suggested that the total costs and average cost per player tested were similar across all interventions. No intervention was judged to be dominant. **PSA** Sensitivity analysis showed that the following scenarios increased costs: increasing the costs associated with the test	**Author identified:** Screening uptake could not be estimated for any single intervention arm so conclusions about the relative cost-effectiveness of interventions could not be drawn. Uptake of STI testing may have been underestimated as the analysis did not capture additional	**Source of funding:** NIHR **Further research:** The authors suggested analysing further uncertainties around cost and outcome parameters if a full RCT was conducted. The authors also stated that further research is needed to explore the public health benefits associated with screening

Jackson 2015						
Study	**Method of Analysis**	**Costs**	**Outcomes**	**Results**	**Limitations**	**Comments**
Population: Men aged 18 years and over within six amateur football clubs in London **Population size:** 153 **Intervention:** Captain-led and poster STI screening promotion **Comparator(s):** Sexual health advisor-led and poster STI screening promotion; poster-only STI screening promotion	**Utilities:** NA	**Health advisor-led:** 88.33 **Poster-only:** 81.87 **Currency & cost year:** UK£; year 2012/2013	50 **Health advisor-led:** 67 **Poster-only:** 61	kit boxes (to adjust for costs associated with unused boxes), increasing sample processing costs, and including an incentive in the analysis. Furthermore, including costs for team captains to deliver the promotion made the captain-led arm more expensive. In contrast, the following scenarios reduced costs: decreasing the time needed for club recruitment and reducing intervention costs for the poster control arm. Lastly, varying uptake levels had an effect on the result. **Uncertainty:** Sensitivity analyses were carried out, analysing uncertainties around all key cost and outcome parameters.	downstream testing that may have occurred as a result of the intervention. **Reviewer identified:** As the analysis was a preliminary economic analysis, full incremental results were not calculated and only limited sensitivity analyses were conducted.	interventions in non-clinical settings so that the cost-effectiveness can be fully evaluated.
Overall applicability: Partly applicable		**Overall quality: Minor limitations**				
Abbreviations: NHS: National Health Service; NIHR: National Institute for Health Research; PSA: probabilistic sensitivity analysis; RCT: randomised controlled trial; STI: sexually transmitted infection; UK: United Kingdom						

Kerry-Barnard 2020						
Study	**Method of Analysis**	**Costs**	**Outcomes**	**Results**	**Limitations**	**Comments**
Study type: Cost analysis to compare the costs of non-incentivised testing, incentivised testing and maximum possible uptake **Country:** UK **Population:** 16-24 year old students recruited from six technical colleges in South London **Population size:** 509 **Intervention/Comparator:** Test n Treat, an intervention which aimed to test students for chlamydia trachomatis (CT) and neisseria gonorrhoeae (NG) on site, giving a same day result and offering same day on-site treatment for students with a positive CT test. 7 scenarios were reported in the cost analysis: 1. The average (a), minimum (b), maximum (c), half the average (d)	**Perspective:** UK NHS **Time horizon:** One year **Discounting:** NA **Data sources Costs:** Integrated Sexual Health Tariff **Effects:** NA **Utilities:** NA	**Probabilistic results** **Cost per student, £** 1a. Average uptake non-incentivised: 237 1b. Lowest uptake non-incentivised: 1082 1c. Highest uptake non-incentivised: 88 1d. Half the average uptake non-incentivised: 448 1e. Double the average uptake non-incentivised: 13 2. Average incentivised uptake: 91 3. Maximum incentivised uptake: 47 **Cost per CT infection detected (£):** 1a. 4657 1b. 21,281 1c. 1723 1d. 8813 1e. 2579 2. 1408 3. 925	**Probabilistic results** **Number of students screened, per day, per college:** 1a. 5 1b. 1 1c. 17 1d. 2.5 1e. 10 2. 19 3. 49	**Probabilistic results** Results showed that higher uptake of the Test n Treat service reduced the cost per screen. The study results suggest that incentivising testing could help increase uptake without reduce positivity rates. **PSA** Not conducted. **Uncertainty:** Sensitivity analyses were not conducted.	**Author identified:** Although most test times were documented, some were estimates. The study may not be widely applicable as it was focused on six colleges in South London, where there is access to multiple NHS sexual health services. Costs may be higher in other settings and uptake of services may be higher in other settings. Only a small number of students was screened per day which meant that the per student cost was sensitive to changes in the number of students screened per day.	**Source of funding:** NIHR **Further research:** The authors did not specify any areas for future research.

Kerry-Barnard 2020						
Study	**Method of Analysis**	**Costs**	**Outcomes**	**Results**	**Limitations**	**Comments**
and double the average (e), number of students who used the non-incentivised service. 2. The average number of students who used the incentivised service (when students received £10 for participation). 3. The maximum number of students who could use the service if it were run at full capacity.		**Cost per NG infection detected (£):** 1a. 13,970 1b. 63,842 1c. 5169 1d. 26,438 1e. 7736 2. 7042 3. 2774 **Currency & cost year:** UK£; year 2018			**Reviewer identified:** The study did not consider any outcomes and so did not calculate any results, other than the costs reported. No sensitivity analyses were conducted.	
Overall applicability: Partly applicable		**Overall quality: Minor limitations**				
Abbreviations: CT: chlamydia trachomatis*; NG: neisseria gonorrhoeae; NHS: National Health Service; NIHR: National Institute for Health Research; PSA: probabilistic sensitivity analysis; UK: United Kingdom*						

Looker (2019)						
Study	**Method of Analysis**	**Costs**	**Outcomes**	**Results**	**Limitations**	**Comments**
Study type: Economic evaluation of six different recall methods for the retesting of chlamydia positive individuals. Using	**Perspective:** Health care provider **Time horizon:** One year **Discounting:** None	**Intervention cost per person (£; 10-14 weeks since treatment of first infection):** 1. Client-led: 55.54 2. Reminder card: 55.64	**Chlamydia Retest rate (%):** 1. Client-led: 5% 2. Reminder card: 4% 3. SMS invitation: 8% 4.Phone invitation: 6% 5. Automatic postal test kit: 10%	**Adjusted cost per retest (£, incorporating incomplete uptake/non-return of kits):** 1. Client-led: 109 2. Reminder card: 130 3. SMS invitation: 120	**Author Identified-** They did not specifically look at the effect of factors such as gender, country of birth, sexual orientation,	**Source of funding:** National Institute for Health Research Health Protection Research Unit **Further research:**

Looker (2019)						
Study	**Method of Analysis**	**Costs**	**Outcomes**	**Results**	**Limitations**	**Comments**
data from the National Chlamydia Screening Programme (NCSP) audit from 2014[a]. **Country:** England **Population:** 15-24-year olds **Population size:** 2,853 **Intervention:** Six different recall methods were analysed. Client-led; reminder card; SMS invitation; phone invitation; automatic postal test kit; advice at follow-up and SMS. **Comparator(s):** No recall.	**Data sources** **Costs:** NCSP audit 2014[a] and assumptions **Effects:** Number of individuals returning a positive recall test **Utilities:** NCSP audit 2014[a]	3. SMS invitation: 58.28 4. Phone invitation: 67.31 5. Automatic postal test kit: 44.83 6. Advice at follow-up and SMS: 70.05 **Currency & cost year:** GB£; 2014	6. Advice at follow-up and SMS: 12%	4.Phone invitation: 289 5. Automatic postal test kit: 190 6. Advice at follow-up and SMS: 195 **Uncertainty:** Two sensitivity analyses were conducted. In the first sensitivity analysis, they replaced parameters for the retesting pathway with those obtained from data for retesting done between 10-26 weeks. Extending the retesting period did not impact substantially on the cost, but did substantially lower the adjusted cost per retest. For the second analysis, staff salary costs were altered from nurse bands to administrator bands. This only had substantial impact on costs for those methods where clients were contacted by phone. The most cost-effective recall method in terms of the adjusted cost per retest was the client led no active recall (method	perceived risk of infection and presence of symptoms on retest uptake and therefore cost They did not consider other important factors besides cost such as the demography of the population: for example, automatically sending out postal kits might be the only feasible option in rural areas.	The authors highlighted that online testing with automated recall is likely to be most economical, but was beyond the scope of their analysis.

Looker (2019)						
Study	**Method of Analysis**	**Costs**	**Outcomes**	**Results**	**Limitations**	**Comments**
				1). This was consistent when looking at the 10-14-week timeframe, 10-26-week timeframe and if administrators are used instead of nurses.		
Overall applicability: Applicable **Overall quality: Minor limitations**						
Abbreviations: NCSP: National Chlamydia Screening Programme; SMS: Short Message Service; QALY: quality-adjusted life year						
a. Re-testing of those who tested positive for chlamydia: National audit report. https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/471585/NCSPre-testingauditfinalversion.pdf (Accessed 13 Sep 2016).						

Appendix I – Health economic model

Background

The economic impact of strategies to improve uptake and to increase frequency of STI testing has been explored previously through cost-effectiveness studies. However, there is limited evidence capturing the combined effects of alternative means of testing across multiple STIs, as well as the impact of preventing costs from downstream effects as a consequence of the primary STI. These consequences include prevention of complications from untreated STIs as well as transmission to partners.

There is a general focus on chlamydia testing, whilst impact of remote self-sampling on gonorrhoea and syphilis are limited. Gonorrhoea is attributable to a rising number of antibiotic resistance strains [1], whilst syphilis can lead to serious complications which may not be reversible if untreated [2].

The purpose of this model is to quantify the impact of remote self-sampling on the cost and health of individuals when compared with testing at clinics. The model aims to capture the downstream effects of detecting and treating STIs which remain undiagnosed in the population of interest. These include, prevention of STI related complications and transmission to sexual partners.

Decision Problem

The decision problem to be addressed by this analysis is summarised in Table I.1 below.

Table I.1 – Summary of decision problem

Perspective	NHS, PSS and local authority
Population	General population (16+ years), young people (16 to 24 years), GBMSM, black ethnic minority, people engaging in so-called chemsex – model focuses on testing for people who are asymptomatic
Intervention	Home self-sampling for STIs
Comparator	Standard in clinic STI testing
Type of evaluation	Cost-utility analysis
Time horizon	1 year for evaluating the change on infection rates from the intervention, with lifetime consequences for STIs occurring within that year

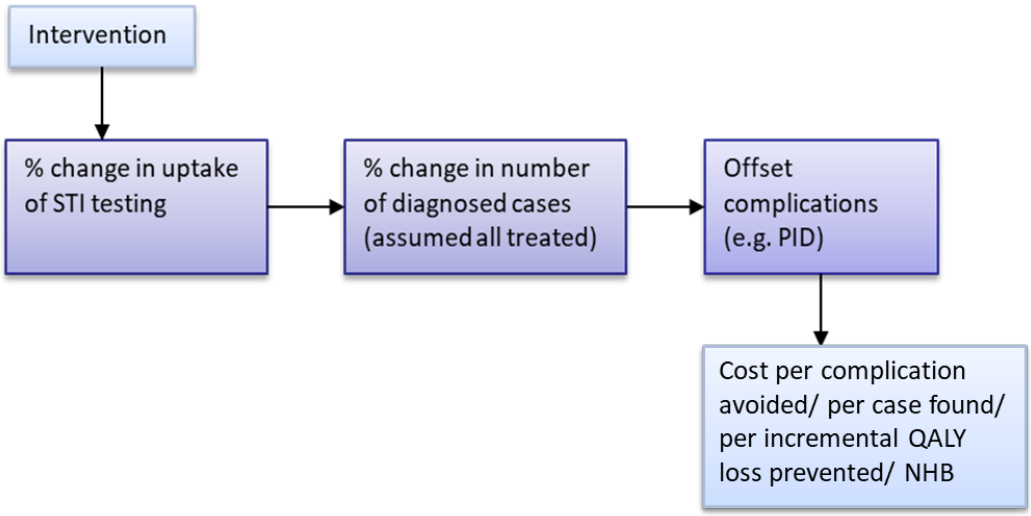
It is not expected that in clinic testing would be removed as an option for any individuals, should they choose to use it. Rather, the model looks at a world where remote s elf-sampling is routinely available as an option, compared to one where it is not.

Model Structure

The model developed estimates the impact of an increase in testing coverage across three bacterial STIs (chlamydia, gonorrhoea, and syphilis), allowing for independent and combined STI analyses. An increase in testing coverage, primarily amongst those who are asymptomatic, is attributable to an increase in the number of STI diagnoses. All costs and health outcomes incurred over a one-year time horizon were included. Outcomes were analysed based on a willingness to pay of £20,000 per QALY.

Long-term complications for each STI were included in the model and assumed to be averted if the STI is diagnosed, and therefore, treated. The cost and health impact of testing was estimated by calculating the number of complications averted from excess cases being detected through remote self-sampling, which would have otherwise remained untreated. Additional considerations included how many tests, once ordered, are used and returned and the usability of returned samples. In addition to primary cases of STIs detected directly through remote self-sampling, secondary effects are also captured by exploring transmission from partner and the consequent prevention of complications attributable to STIs in secondary cases. A visual depiction of the conceptual model is presented in Figure I.1.

Figure I.7 – Conceptual model diagram



The results of the analysis are presented as a series of scenarios, beginning with the most optimistic scenario. The assumptions which underpin this scenario are varied, one at a time and the impact on cost-effectiveness explored.

Inputs

This section details the data used to inform parameters in the model. Published data specific to each STI were used where possible. Where parameters were applicable to all three STIs, these are indicated.

Population

Five populations are included for consideration in the model:

- General population (16+ years)
- Young people (16 to 24 years)
- Gay, bisexual and other men who have sex with men (GBMSM)
- Black ethnic minority
- People engaging in so-called chemsex (“chemsex”)

An arbitrary gender split of 50% being female was assumed for relevant calculations in the general population, young people, and black ethnic minority but not the GBMSM and chemsex populations (which were modelled as 100% male).

For each population, by STI, the number of people undergoing tests and the prevalence of the STI within the tested population were sourced from publicly available sources, which should reflect current testing in practice. Table I.2 details the number of people tested. Where data specific for each population was not available, estimates for other populations were adapted (see table footnotes for details).

Table I.2 – Number tested for each STI by population

Population	Chlamydia	Gonorrhoea	Syphilis	Source
General population	3,496,315	2,075,156	1,517,769	PHE [3]
Young people	1,339,931	795,285 *	581,671 *	PHE [4]
GBMSM	224,820	267,986	246,020	PHE [3]
Black ethnic minority	86,011	68,480 **	50,086 **	PHE [4]
So-called chemsex	22,482	26,799	24,602	Assumption #

* Assumption, calculated as 38.3% of the number tested in general population based on proportions in chlamydia testing

** Assumption, calculated as 3.3% [5] (proportion of England population who are of black ethnicity) of the number tested in general population.

Assumed to be 10% of the GBMSM population [6], based on it being currently most common gay, bisexual and other men who have sex with men [7]

The main importance of this data within the model is the ratio of different tests between the various STIs. The absolute number of tests does not make a significant difference to cost-effectiveness, as this will change both the costs and benefits of additional testing in equal proportion.

Prevalence of STIs within the tested population (see Table I.3) was estimated by dividing the number of positive STI diagnoses by the total number undergoing tests for the STI (Table I.2). Where data specific for each population was not available, estimates for other populations were applied (see table footnotes for details).

Table I.3 – Prevalence of STI in tested population for each STI, by population

Population	Chlamydia	Gonorrhoea	Syphilis	Source
General population	6.6%	3.4%	0.5%	PHE [3]
Young people	10.0%	3.2%	0.2%	PHE [3, 4]
GBMSM	10.3%	12.6%	2.4%	PHE [3]
Black ethnic minority	13.8%	12.6%*	2.4%*	PHE [4]
So-called chemsex	10.3%*	12.6%*	2.4%*	Assumption

* Assumed to be the same as GBMSM in the relevant STI group

Remote self-sampling effectiveness

In the optimistic scenario, it is assumed that the risk of STI remains constant in the excess population that take up testing (i.e. the increase in number of completed tests and proportion of positive tests are linear). Based on a meta-analysis of 7 studies, use of remote self-sampling resulted in an increase in positive tests of 71%. Following the assumption above, the number of tests conducted are estimated to also increase by 71%. The studies looked at STIs overall for the general population. Due to limitations on data availability, this was assumed to be applicable for all five populations and the three STIs (no RCTs were conducted in any of the specific subpopulations, and results were not broken down by tests for different STIs).

Test wastage

The optimistic scenario analysis assumes that 100% of the tests ordered are completed and returned. Of the returned samples, all samples are assumed to be usable and fit for purpose without the need for resampling. In reality, there is likely to be a proportion of tests which are not returned with consequent HRQoL and cost implications. Therefore, the model includes functionality to capture the consequences of unreturned tests.

The number of unreturned tests was calculated using the formula below:

$$\frac{No.\,of\ completed\ tests}{(1 - proportion\ unreturned)} * Proportion\ unreturned$$

Additionally, a small number of returned tests may not be in a suitable state for confirming if the individual is positive for an STI. According to the PHE HIV self-sampling data 7.8% of returned samples were not usable due to: sample being haemolysed, insufficient blood, or the sample is equivocal [8]. Whilst this may not be as large an issue for chlamydia and gonorrhoea testing which occur through swabs, it remains relevant for syphilis testing. In the optimistic scenario analysis, it is assumed that all returned samples are fit for purpose and do not require retesting. The committee noted that, in practice, positive syphilis tests often would require retesting, as the self-sampling kits provide a measure of antibody positivity, which will remain positive in people with a previous infection, and therefore are not automatically a marker of current infection.

STI related complications

The total excess number of STIs diagnosed, and treated, was calculated as the difference between the diagnosed number with standard testing and remote self-sampling. For each STI, at least one complication was captured in the model. A simplifying assumption is applied that if an STI is diagnosed, and therefore treated, long-term STI related complications are prevented. As the model is looking at testing for asymptomatic people, only reduced long-term complications from untreated infections are considered in the model, and not any short-term gains in quality of life (this may slightly underestimate the benefits of increased testing, as a proportion of those asymptomatic people may become symptomatic at a later stage. The table below outlines the risk of an untreated STI leading to complication(s).

Table I.4 – Prevalence of STI related complications

STI-related complication	Risk of implication (as a percentage of those with the infection)	Source
Chlamydia		
TFI (tubal factor infertility)	0.5%*	Price et al. (2016) [9]
PID (pelvic inflammatory disease)	17.0%	Price et al. (2013) [10]
Gonorrhoea		
PID (pelvic inflammatory disease)	15.0%	NHS [11]
Syphilis		
Neurosyphilis	4.5%	PHE [12]

* Calculated – for every 1,000 chlamydia infections in women aged 16-44 years, on average, 5.1 TFI cases are observed.

TFI and PID are complications that occur in females (and other people with a womb) only. The number of excess cases of STI diagnosed was calculated for each of the three STIs (i.e. the untreated group in the standard care arm). The risk of developing a complication was

multiplied by the excess diagnoses, and by the proportion female in the cases of TFI and PID, to estimate the number of complications prevented with remote self-sampling.

Sexual risk behaviour

The impact of remote self-sampling on secondary cases through transmission to sexual partners was also explored. Due to data limitations a simplified approach was taken by estimating the number of sexual partners with whom condoms are used, and the number of partners with whom condoms are not used.

There was conflicting data to inform the number of sexual partners for each population, with large variability observed between sources. Marcus et al. reported 12 partners in a 3-month period for the GBMSM population [13]. This was extrapolated to a year, non-linearly, where it is assumed that at any time 2/3 of the partners are long-term (i.e. 4 new partners every 3 months). Therefore, the estimated number of partners in a year is 24 for the GBMSM population and assumed to be applicable for the chemsex population (this is likely to be an underestimate for the chemsex population, and remote self-sampling would become more cost-effective if a higher number of partners were assumed, due to the increased benefits of reducing secondary infections).

Mercer et al. reported that 67.1% of 16- to 74-year olds had one partner over one year, whilst 17.9% had 0 and 14.0% had 2 or more [14]. Whilst the younger age categories had a larger proportion with 2 or more partners, compared with older age categories, the study did not specify the average number of partners by age category, if above 1. Glick et al. reported a median of 4 sexual partners in one year in the GBMSM population, whilst 1 median sexual partner for heterosexuals [15]. This ratio of four to one was applied to the estimated annual number of sexual partners for the GBMSM and chemsex populations (24 partners per year) resulting in 6 sexual partners annually for general, young people, and Black ethnic group populations. This may be an underestimate or overestimate depending on the population considered, however in light of limitations on data availability within the targeted search conducted, this gave us a useful estimate for base case calculations. These assumptions were able to be varied in sensitivity and scenario analysis. In particular, the committee noted that as there was no evidence for differences in the effectiveness of the intervention for the different subpopulations, these analyses were necessarily exploratory in any case.

The average number of sexual partners without condom use for each population was estimated using data on the proportion of condom use (88% for the GBMSM and chemsex populations, [16] and 54% for the remaining three populations[17]). Annual number of sexual partners without condom use was estimated by multiplying the total annual number of sexual partners by the proportion not using condoms for the relevant population. The estimated number of sexual partners without condom use for the general, young people, and Black ethnic minority populations was 2.39. Whilst GBMSM and chemsex populations were estimated to have 2.88 sexual partners without condom use (again, the committee agreed this is likely to be an underestimate for the chemsex population, and cost-effectiveness in this population would increase if this is correct).

Not everyone with an STI will transmit the disease to their partner with potential differences in risk depending on condom use. There was a scarcity of evidence to appropriately inform the overall risk of transmission, particularly for different STIs and populations. Therefore, assumptions have been applied, guided by literature-based evidence where possible, to estimate the impact on partners. For chlamydia, the risk of transmission from an infected partner was estimated to be 65%, based on 65% of male partners of chlamydia positive women being found to be infected with the STI [18]. Following a targeted search, no evidence was found to inform transmission risk for gonorrhoea and syphilis. Therefore, a conservative risk of 20% was applied in the model for these two STIs. Overall risk of transmitting or contracting an STI was estimated as composite probabilities from the prevalence of STI in tested population and transmission risk from infected partner. It was calculated by taking the product of the probability of one person in the partnership being

infected, the probability of the other person not being infected, the probability of transmission, and 2 (to account for the bidirectional possibility of transmission). Therefore, as an example, for the general population, the estimated overall risk of transmitting/contracting an STI was 8% for chlamydia, based on a probability of being infected of 6.6% and a transmission risk from infected partner of 65%.

This 8% was multiplied by the total number of sexual partners without condom use, for the excess population diagnosed in the general population, to calculate total number of secondary STI cases prevented.

The use of a condom may not provide complete protection against contracting an STI. Relative risk of contracting STIs with condom is used compared to when it is not was sourced from the PHE return on investment tool [12]. This was estimated to be 0.42 for chlamydia and gonorrhoea, and 0.49 for syphilis [12]. The total number of secondary STI cases with condom use was estimated by taking the product of the overall risk of transmitting/contracting STI, relative risk of contracting STI with condom use, and the total number of sexual partners with condom use for the cohort.

Similar to the excess primary STI cases detected, a simplifying assumption is applied that all excess cases diagnosed through home testing is treated thereby preventing downstream transmitting to partners. Whilst this is not truly reflective of the real world, to accurately model additional downstream impacts would require further assumptions around the proportion that remain at risk of STI in the excess population that is identified and treated promptly. This combined with the evidence available to populate such parameters will add further uncertainty to the model.

Test costs

Remote self-sampling kits are made up of two elements, cost of dispatch and cost of sample processing, where the latter makes up the largest component of the test cost. In the base case analysis, all ordered remote self-sampling kits are assumed to be fit for use and do not require re-testing.

Cost of STI testing is dependent on the number of STIs being tested for. For this reason, two test costs were included in the model for both the standard testing and remote self-sampling (see Table I.5 below). Testing for all three STIs is associated with a higher cost than testing for chlamydia and gonorrhoea together. There was limited data to inform the extent of each test use across the UK. Therefore, a simplified approach was used to estimate STI test costs. The higher cost of testing for all three STIs is applied to the number of people testing for syphilis (the smallest number of tests of the three STIs). The difference between the number testing for syphilis and the number testing for chlamydia or gonorrhoea (where the highest number between the latter two STIs are used) is calculated, to which the cost of testing for chlamydia and gonorrhoea is applied.

Unreturned tests

A simple approach is taken to calculate the cost associated with unreturned remote self-sampling test kits. The sum of unreturned tests across all three STIs are calculated and multiplied by the largest of the dispatch costs for the remote self-sampling test kits (£5, see Table I.5).

Table I.5 – Number tested for each STI by population

STI/ complication	Cost	Source
Standard test (all 3 STIs tested)	£73.88	Pathway Analytics (T4) [18]
Standard test (2 STIs tested)	£44.57	Pathway Analytics (T2) [18]
Remote-self sampling test (all 3 STIs tested)		
Test dispatch	£5.00	PHE [19]
Test processing	£36.88	
TOTAL	£41.88	
Remote self-sampling test (2 STIs tested)		
Test dispatch	£4.50	PHE [19]
Test processing	£25.78	
TOTAL	£30.28	

Clinic testing

In the base case it is assumed that a positive remote self-sampling test result will result in immediate commencement of treatment (i.e. a confirmatory in clinic test is not required). The model includes an option to select confirmatory clinic test for each of the three STIs individually or together, when testing positive. If clinic testing is selected for more than one STI, this is also calculated using the hierarchy approach outlined above.

Treatment costs

The cost of treating each STI or complication is outlined in the table below. The unit costs of treating STIs and complications were multiplied by the number of people with each STI and complication. Costs were sourced from the STI return on investment tool report developed by PHE [12]. Cost of neurosyphilis included the cost associated with the treatment of neurosyphilis and the larger cost of treating permanent disability, estimated to occur in 30% of those with neurosyphilis [12]. All relevant costs were inflated to 2019 costs using the PSSRU inflation index [20].

Table I.6 – Number tested for each STI by population

STI/ complication	Cost*	Source
Chlamydia	£59	PHE ROI tool report [12]
Gonorrhoea	£134	
Syphilis	£77	
PID*	£185	Huntingdon et al. (2018) [21]
TFI	£11,600	PHE ROI tool report [12]
Neurosyphilis*	£11,953**	

* Inflated to 2019 costs using the PSSRU inflation index [20]

** Calculated – weighted average cost of neurosyphilis with and without permanent brain damage.

QALYs

Health impacts were captured through QALY loss in the model and were applicable to each STI as well as the downstream complications associated with the STI. Table I.7 outlines a summary of the QALY loss data applied in the model.

As the intervention is expected to lead to an increase in testing amongst the asymptomatic population, the target group, QALY loss due to the STIs themselves were not applied to the excess number of cases detected but only to individuals estimated to have STIs as a

consequence of sexual partnership. The short-term QALYs losses estimated represent a weighted average of losses for asymptomatic and symptomatic infections, and can therefore be applied to all secondary infections in the model, without the risk of overestimating benefits.

Neurosyphilis can lead to permanent disability in 30% of cases [12]. The utility used for neurosyphilis was a weighted average of utility with and without permanent brain damage.

Table I.7 – Number tested for each STI by population

STI/Complication	QALY loss	Source
Chlamydia	0.002	PHE ROI tool report [12]
Gonorrhoea	0.002	
Syphilis	0.01	
Complication – PID	0.004	
Complication – TFI	4.21	
Complication – neurosyphilis	0.73	

Results

Optimistic scenario

All results are presented per 10,000 people undergoing standard in clinic STI testing. The optimistic scenario focuses on the general population, considering testing for all 3 STIs together. All tests ordered are assumed to be returned, where all returned samples are fit for purpose, therefore, not requiring re-testing. A positive remote self-sampling test does not require a confirmatory clinic test before commencing treatment.

Given the above assumptions, the use of remote self-sampling is estimated to be highly cost-effective, with an incremental cost-effectiveness ratio (ICER) of £3,865 when compared with standard STI testing (when QALY losses over the whole of a person's life are considered). Remote self-sampling is estimated to prevent 3.83 QALY loss at the expense of an additional cost of £14,794.

Table I.8 – Results for general population: optimistic scenario

	Standard	Remote self-sampling	Incremental
Total annual cost	£315,932	£330,726	£14,794
Total number of cases	435	823	388
Total number of complications avoided			33
Total QALY loss prevented			3.83
Cost per complication avoided			**£452**
Cost per incremental case found			**£38**
NHB (net health benefit)			**3.09**
ICER			**£3,865**

The table below outlines the key outcomes for all five populations considered in the model. The chemsex and GBMSM populations are informed by the same data due to evidence gaps to inform chemsex specific parameters. Remote self-sampling is estimated to be cost-effective for use across all five populations considered with the black ethnic minority population being the most cost-effective (use of remote self-sampling is both cost saving and

prevents QALY loss for this population). The cost savings are largely observed due to the increased prevalence of chlamydia in the tested population for the black ethnic minority, the highest of all five populations. There is also a larger absolute number of people testing with chlamydia than gonorrhoea and syphilis. Both factors result in a larger number of cases detected (1,070 per 10,000 people). The cost-effectiveness in the GBMSM population is slightly lower than in the general population due to higher estimated condom use in that population, and consequently a lower risk of secondary infections.

Table I.9 – Results by population

	ICER	NHB	Incremental cost	QALY loss prevented	Incremental cases detected
General population	£3,865	3.09	£14,794	3.83	388
Young people	£1,371	5.81	£8,553	6.24	595
GBMSM	£4,003	1.84	£9,204	2.30	779
Black ethnic minority	- £691	9.95	-£6,648	9.62	1,070
So-called chemsex	£4,003	1.84	£9,204	2.30	779

The committee noted there were considerable uncertainties and data gaps associated with these subgroups, and therefore their confidence in these results was considerably lower than in the general population results. However, they did note that all these subpopulations appeared to be either approximately as or more cost-effective than in the general population, and they were therefore confident that any recommendations justified for the general population would also be applicable to these subgroups.

Lower risk among excess cases scenario

Evidence from a meta-analysis of RCT studies suggests that the increased uptake of remote self-sampling may be in a lower risk population than for in clinic testing. The study reported that for a 93% increase in completed tests there was only a 71% increase in positive STI diagnoses (these values were not significantly different and therefore this finding may simply be a chance result, but the committee agreed it was worth investigating). The model was rerun, for the general population, using these two values instead of assuming a constant increase in completed tests and positive diagnosis (see table below).

The inclusion of a differential increase in completed tests and positive diagnoses results in a larger ICER (£3,865 and £13,877 for the optimistic scenario and the lower risk scenario, respectively). However, the use of remote self-sampling is still estimated to be cost-effective at a threshold of £20,000 per QALY. The additional cost of testing is compensated for by the QALY loss prevented.

Per 10,000 people undergoing standard STI testing, for equivalent outcomes, an additional 1,287 people need to be tested with the remote self-sampling kit.

Table I.10 – Results: lower risk among excess remote self-sampling users

	ICER	NHB	Incremental cost	QALY loss prevented	Incremental cases detected
Optimistic scenario	£3,865	3.09	£14,794	3.83	388
Lower risk scenario	£13,877	1.17	£53,112	3.83	388

An alternative explanation for the difference between test return rates and positive test return rates is this represents returned tests which are not usable for analysis, due to not having been completed properly. This possibility is tested in an alternative sensitivity analysis below.

Unreturned test impact

A PHE report on HIV self-sampling reported that 55.7% ordered tests were returned, for 2018/19 [8]. Whilst this may vary depending on the STI and the type of test that individuals have to complete (i.e. blood sample vs swabs, with expected lower return rates for blood samples, such as HIV testing), due to limited data, a common proportion of 44.3% of ordered tests are unreturned was applied as a scenario analysis (see results in table below).

The use of remote self-sampling is estimated to no longer be cost-effective at £20,000 per QALY as the costs incurred from tests dispatched is not compensated for by the QALY loss prevented from picking up additional STIs. However, using threshold analysis we estimate if 43.7% were unreturned remote self-sampling would be cost-effective at £20,000 per QALY.

Table I.11 – Results: unreturned self-sampling kits

	ICER	NHB	Incremental cost	QALY loss prevented	Incremental cases detected
Optimistic scenario	£3,865	3.09	£14,794	3.83	388
Unreturned scenario	£21,632	-0.31	£82,795	3.83	388

Re-testing due to unfit sample

As discussed in earlier sections, 7.8% of HIV samples are estimated to not be fit for confirmation of a positive HIV diagnosis. This value is used as a proxy for the proportion of tests that are unusable and require retesting in this scenario, though this may be an over-estimate, again due to the expected higher complexity of blood sampling compared to sampling for chlamydia and gonorrhoea (see table below).

If 7.8% of test samples require re-testing (and therefore accrue additional costs without additional benefits), the use of remote self-sampling is estimated to be cost-effective. The additional cost of testing is compensated for by the QALY loss prevented from detecting positive STI diagnoses. However, if more than 20% of the samples require re-testing then the use of remote self-sampling will no longer be cost-effective at £20,000 per QALY.

Table I.12 – Results: re-testing due to unfit sample

	ICER	NHB	Incremental cost	QALY loss prevented	Incremental cases detected
Optimistic scenario	£3,865	3.09	£14,794	3.83	388
Re-testing scenario	£9,935	1.93	£38,025	3.83	388

Clinic testing

The impact of clinic confirmatory test on the costs and cost-effectiveness of remote self-sampling was explored. Two specific scenarios are considered: clinic testing of only positive syphilis cases, and clinic testing of all STI positive cases from any of the three tests simultaneously conducted. See the table below for the summary of results.

The use of remote self-sampling is estimated to be cost-effective for both scenarios considered at a threshold of £20,000 per QALY.

Table I.13 – Results: confirmatory clinic testing

	ICER	NHB	Incremental cost	QALY loss prevented	Incremental cases detected
Optimistic scenario	£3,865	3.09	£14,794	3.83	388
Syphilis only scenario	£4,237	3.02	£16,216	3.83	388
All STIs scenario	£16,901	0.59	£64,685	3.83	388

Combined analysis

A combination of the scenarios conducted was explored to see the combined effects they have on the ICER. The table below presents results for a:

1. 93% increase in tests completed, but only a 71% increase in positive diagnoses
2. 44.3% of ordered tests unreturned
3. Clinic testing for those who test positive for syphilis

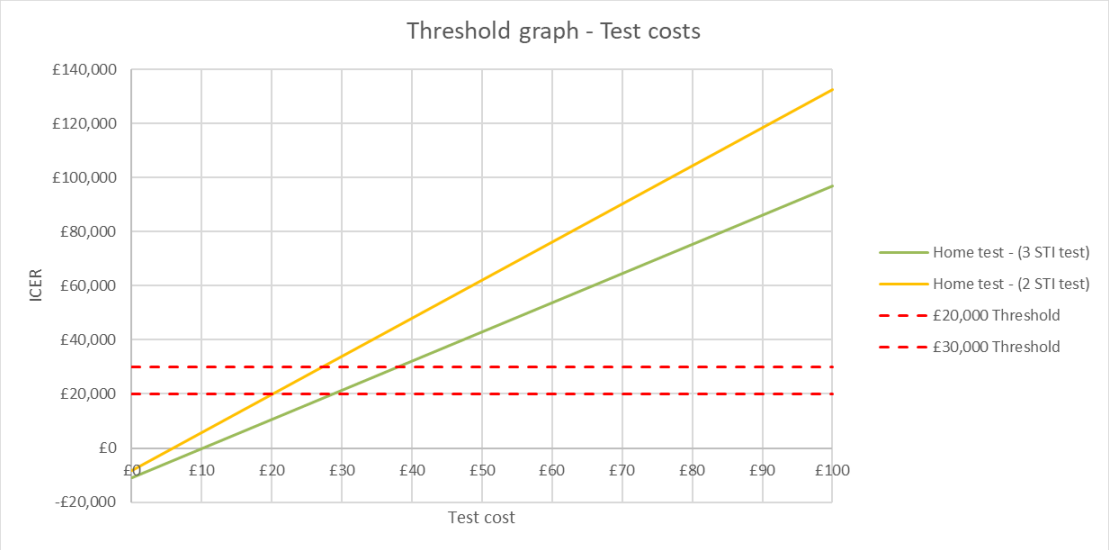
Table I.14 – Results: combined analysis

	ICER	NHB	Incremental cost	QALY loss prevented	Incremental cases detected
Optimistic scenario	£3,865	3.09	£14,794	3.83	388
Combined scenario	£34,302	-2.74	£131,284	3.83	388

This particular combination of assumptions was chosen to reflect what the commtiee felt was a plasubile worst-case scenario for home testing, and thus a lower bound on potential cost-effecignvess. In this scenario, use of remote self-sampling is not estimated to be cost-effective when compared with standard STI testing at both £20,000 and £30,000 per QALY. However, if there is a 58% reduction in the proportion of unreturned tests (18.5%) then the use of remote self-sampling is estimated to be cost-effective at £20,000 per QALY.

Alternatively, remote self-sampling is cost-effective if the cost of the self-sampling kit decreases by approximately 32% (i.e. 2 STI self-sampling test cost is reduced from £30 of £20; or full STI self-sampling test cost is reduced from £42 to £28), see graph.

Figure I.8 – Cost threshold graph



TFI sensitivity

One of the largest drivers of the results is the cost and QALY loss associated with TFI. Whilst only attributable to females (assumed to be 50% of the population), the cost of treating TFI is substantially higher than treating the primary infection or other complications such as PID.

Additionally, though the cost is comparable to the treatment cost for neurosyphilis, as there is a larger absolute number of people being tested for chlamydia, and subsequently testing positive, this is a larger driver of the results.

The table below presents the impact of the inclusion and exclusion of TFI from the analysis. Exclusion of TFI is associated with increased incremental costs and decreased benefits from preventing lower QALY loss. The use of remote self-sampling is no longer cost-effective.

Table I.15 – Results: combined analysis

	ICER	NHB	Incremental cost	QALY loss prevented	Incremental cases detected
Optimistic scenario	£3,865	3.09	£14,794	3.83	388
Scenario with TFI excluded	£43,263	-0.64	£23,822	0.55	388

Discussion

The use of remote self-sampling for diagnosing STIs has the potential to be cost effective in the general population accessing STI testing, and across all five subpopulations considered,. It will also be more cost-effective in populations with higher baseline rates of STIs. The benefits of detecting additional STIs stems primarily from the prevention of complications, as a result of untreated STIs and preventing transmission to sexual partners.

There are uncertainties within the data used to inform the model parameters. Scenario analyses show that the results are particularly sensitive to the proportion of unreturned tests, as these incur additional costs from test dispatch without the benefit of detecting STI cases. The estimate of the proportion of unreturned tests used currently is based on data for HIV self-sampling. Considering the STIs in this model this may be an overestimate as the form of sample required for STIs differ (i.e. blood samples for HIV and syphilis, swabs for chlamydia and gonorrhoea). The cost data used to inform the model are likely to be greater than the actual costs, due to either being based on London prices (which may be higher) or costs sourced from previous years, where this may be lower now (due to greater uptake of home self-sampling, and consequent reduction in costs due to economies of scale). Where possible the upper bound of costs have been used, although this is applicable to both the standard testing and remote self-sampling costs, and therefore any overestimation is likely to have marginal impact on the incremental cost of testing.

Another factor to consider is how complications are captured within the model. One of the key drivers of the model results is the QALY and cost impact associated with TFI. It occurs in only 0.5% of those with chlamydia, assumed to be limited to those with untreated STI. However, chlamydia is the largest contributor to the overall number of tests conducted of all three STIs. Therefore, it makes up the largest proportion of the QALY loss prevented, as well as the costs saved from treatment. Considering the optimistic scenario, exclusion of TFI results in remote self-sampling no longer being cost-effective. However, TFI is a crucial complication of untreated chlamydia with the impact being irreversible and affecting women for the rest of their lives, and the committee agreed it was important to be as comprehensive as possible in capturing the harms associated with untreated STI infections. They also noted these complications were consistent with those used in prior Public Health England evaluations for STIs.

Additionally, a simplifying assumption used in the model is that if STIs are treated, this will prevent the development of STI related complications. This may not be the case in reality, depending on the time passed since acquiring STI and testing positive, as well as the underlying characteristics of the infected individuals. Therefore, the cost and health benefits

of remote self-sampling may be overestimated. Due to the simplified modelling approach undertaken it is difficult to test and quantify the impact this may have on the model results.

Overall the use of remote self-sampling has the potential to be cost-effective compared with current standard care. However, this would be largely dependent on good test return rates along with clear understanding of how to provide usable samples for testing.

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Appendix J – Excluded studies

J.1.1 Excluded quantitative studies

Study	Code [Reason]
Ahmad, Fahd A, Jeffe, Donna B, Plax, Katie et al. (2014) Computerized self-interviews improve Chlamydia and gonorrhea testing among youth in the emergency department. Annals of emergency medicine 64(4): 376-84	- Not a relevant study design
Alarcon Gutierrez, Miguel, Fernandez Quevedo, Manuel, Martin Valle, Silvia et al. (2018) Acceptability and effectiveness of using mobile applications to promote HIV and other STI testing among men who have sex with men in Barcelona, Spain. Sexually transmitted infections 94(6): 443-448	- Not a relevant study design
Baird, Janette and Merchant, Roland C (2014) A randomized controlled trial of the effects of a brief intervention to increase chlamydia and gonorrhea testing uptake among young adult female emergency department patients. Academic emergency medicine : official journal of the Society for Academic Emergency Medicine 21(12): 1512-20	- Non-UK healthcare setting
Bilardi, Jade E, Fairley, Christopher K, Temple-Smith, Meredith J et al. (2010) Incentive payments to general practitioners aimed at increasing opportunistic testing of young women for chlamydia: a pilot cluster randomised controlled trial. BMC public health 10: 70	- Population are not the target group
Bissessor, Melanie, Fairley, Christopher K, Leslie, David et al. (2011) Use of a computer alert increases detection of early, asymptomatic syphilis among higher-risk men who have sex with men. Clinical infectious diseases : an official publication of the Infectious Diseases Society of America 53(1): 57-8	- Not a relevant study design
Buhrer-Skinner, Monika, Muller, Reinhold, Buettner, Petra G et al. (2013) Reducing barriers to testing for Chlamydia trachomatis by mailed self-collected samples. Sexual health 10(1): 32-8	- Not a relevant study design
Buhrer-Skinner, Monika, Muller, Reinhold, Buettner, Petra G et al. (2011) Improving Chlamydia trachomatis retesting rates by mailed self-collection kit. Sexual health 8(2): 248-50	- Not a relevant study design
Bungay, Vicky, Kolar, Kat, Thindal, Soni et al. (2013) Community-based HIV and STI prevention in women working in indoor sex markets. Health promotion practice 14(2): 247-55	- Not a relevant study design
Cassidy, Christine, Steenbeek, Audrey, Langille, Donald et al. (2019) Designing an intervention to improve sexual health service use among university undergraduate students: a mixed methods study guided by the behaviour change wheel. BMC public health 19(1): 1734	- Not a relevant study design
Chacko, Mariam R, Wiemann, Constance M, Kozinetz, Claudia A et al. (2010) Efficacy of a motivational behavioral intervention to promote chlamydia and gonorrhea screening in young women: a randomized controlled trial. The Journal of adolescent health : official publication of the Society for Adolescent Medicine 46(2): 152-61	- Non-UK healthcare setting
Cheeks, Miyesha A, Fransua, Mesfin, Stringer, Harold G Jr et al. (2016) A Quality Improvement Project to Increase Early Detection of Syphilis Infection or Re-infection in HIV-infected Men Who Have Sex With Men. The Journal of the Association of Nurses in AIDS Care : JANAC 27(2): 143-52	- Not a relevant study design
Currie, Marian J, Schmidt, Matthias, Davis, Belinda K et al. (2010) 'Show me the money': financial incentives increase chlamydia screening rates among tertiary students: a pilot study. Sexual health 7(1): 60-5	- Not a relevant study design
Dean, Lorraine T, Montgomery, Madeline C, Raifman, Julia et al. (2018) The Affordability of Providing Sexually Transmitted Disease Services at a Safety-net Clinic. American journal of preventive medicine 54(4): 552-558	- Not applicable to a UK context
DiVasta, Amy D, Trudell, Emily K, Francis, Mary et al. (2016) Practice-Based Quality Improvement Collaborative to Increase Chlamydia Screening in Young Women. Pediatrics 137(5)	- Population are not the target group

Study	Code [Reason]
Dolcini, M Margaret, Harper, Gary W, Boyer, Cherrie B et al. (2010) Project ORE: A friendship-based intervention to prevent HIV/STI in urban African American adolescent females. Health education & behavior : the official publication of the Society for Public Health Education 37(1): 115-32	- Study does not contain a relevant intervention
Downing, Sandra Gaye, Cashman, Colette, McNamee, Heather et al. (2013) Increasing chlamydia test of re-infection rates using SMS reminders and incentives. Sexually transmitted infections 89(1): 16-9	- Non-UK healthcare setting
Eckman, M.H., Reed, J.L., Trent, M. et al. (2020) Cost-effectiveness of Sexually Transmitted Infection Screening for Adolescents and Young Adults in the Pediatric Emergency Department. JAMA Pediatrics	- Population are not the target group
Edelman, Natalie, Cassell, Jackie A, de Visser, Richard et al. (2017) Can psychosocial and socio-demographic questions help identify sexual risk among heterosexually-active women of reproductive age? Evidence from Britain's third National Survey of Sexual Attitudes and Lifestyles (Natsal-3). BMC public health 17(1): 5	- Not a relevant study design
Ewing, M., Read, P., Knight, V. et al. (2013) Do callers to the NSW Sexual Health Infoline attend the services they are referred to?. Sexual Health 10(6): 530-532	- Not a relevant study design
Fine, David, Warner, Lee, Salomon, Sarah et al. (2017) Interventions to Increase Male Attendance and Testing for Sexually Transmitted Infections at Publicly-Funded Family Planning Clinics. The Journal of adolescent health : official publication of the Society for Adolescent Medicine 61(1): 32-39	- Not a relevant study design
Forrest, Garry, Boonwaat, Leng, Douglas, Jenny et al. (2009) Enhanced chlamydia surveillance in New South Wales (Australia) prisons, 2005-2007. International journal of prisoner health 5(4): 233-40	- Not a relevant study design
Friedman, Allison L, Kachur, Rachel E, Noar, Seth M et al. (2016) Health Communication and Social Marketing Campaigns for Sexually Transmitted Disease Prevention and Control: What Is the Evidence of their Effectiveness?. Sexually transmitted diseases 43(2suppl1): 83-101	- Review article but not a systematic review
Goller, Jane L, Guy, Rebecca J, Gold, Judy et al. (2010) Establishing a linked sentinel surveillance system for blood-borne viruses and sexually transmissible infections: methods, system attributes and early findings. Sexual health 7(4): 425-33	- Not a relevant study design
Gotz, Hannelore M, Wolfers, Mireille E G, Luijendijk, Ad et al. (2013) Retesting for genital Chlamydia trachomatis among visitors of a sexually transmitted infections clinic: randomized intervention trial of home- versus clinic-based recall. BMC infectious diseases 13: 239	- Comparator in study does not match that specified in protocol
Goyal, Monika K, Fein, Joel A, Badolato, Gia M et al. (2017) A Computerized Sexual Health Survey Improves Testing for Sexually Transmitted Infection in a Pediatric Emergency Department. The Journal of pediatrics 183: 147-152e1	- Non-UK healthcare setting
Graham, Simon, Guy, Rebecca J, Wand, Handan C et al. (2015) A sexual health quality improvement program (SHIMMER) triples chlamydia and gonorrhoea testing rates among young people attending Aboriginal primary health care services in Australia. BMC infectious diseases 15: 370	- Not applicable to a UK context
Graseck, Anna S, Secura, Gina M, Allsworth, Jenifer E et al. (2010) Home compared with clinic-based screening for sexually transmitted infections: a randomized controlled trial. Obstetrics and gynecology 116(6): 1311-8	- Population are not the target group
Graseck, Anna S; Shih, Shirley L; Peipert, Jeffrey F (2011) Home versus clinic-based specimen collection for Chlamydia trachomatis and Neisseria gonorrhoeae. Expert review of anti-infective therapy 9(2): 183-94	- Review article but not a systematic review
Guy, Rebecca J, Kong, Fabian, Goller, Jane et al. (2010) A new national Chlamydia Sentinel Surveillance System in Australia: evaluation of the first	- Not a relevant study design

Study	Code [Reason]
stage of implementation. Communicable diseases intelligence quarterly report 34(3): 319-28	
Heiligenberg, M., Rijnders, B., Van Der Loeff, M.F.S. et al. (2012) High prevalence of sexually transmitted infections in HIV-infected men during routine outpatient visits in the Netherlands. Sexually Transmitted Diseases 39(1): 8-15	- Study does not contain a relevant intervention
Hengel, Belinda, Jamil, Muhammad S, Mein, Jacqueline K et al. (2013) Outreach for chlamydia and gonorrhoea screening: a systematic review of strategies and outcomes. BMC public health 13: 1040	- Systematic review contains no relevant studies
Johnson, David; Harrison, Patricia; Sidebottom, Abbey (2010) Providing sexually transmitted disease education and risk assessment to disengaged young men through community outreach. American journal of men's health 4(4): 305-12	- Not a relevant study design
Kettinger, Lindsey Diane (2013) A practice improvement intervention increases chlamydia screening among young women at a women's health practice. Journal of obstetric, gynecologic, and neonatal nursing : JOGNN 42(1): 81-90	- Not a relevant study design
Kmietowicz, Z. (2013) Educating practice staff about chlamydia boosts detection in young adults. BMJ (Online) 347(7925): f5613	- Not a peer-reviewed publication
Lawton, Beverley A, Rose, Sally B, Elley, C Raina et al. (2010) Increasing the uptake of opportunistic chlamydia screening: a pilot study in general practice. Journal of primary health care 2(3): 199-207	- Non-UK healthcare setting
Martin, L., Crawford, S., Knight, V. et al. (2013) Poor uptake of community based sexually transmissible infection testing at an inner city needle and syringe program. Sexual Health 10(2): 183-184	- Not a relevant study design
McNulty, Cliodna A M, Hogan, Angela H, Ricketts, Ellie J et al. (2014) Increasing chlamydia screening tests in general practice: a modified Zelen prospective Cluster Randomised Controlled Trial evaluating a complex intervention based on the Theory of Planned Behaviour. Sexually transmitted infections 90(3): 188-94	- Population are not the target group
Mossenson, A., Algie, K., Olding, M. et al. (2012) 'Yes wee can' a nurse-driven asymptomatic screening program for chlamydia and gonorrhoea in a remote emergency department. Sexual Health 9(2): 194-195	- Not a relevant study design
Nguyen, M.P., Sembajwe, S., Rompalo, A.M. et al. (2020) Impacts of STD/HIV Outreach Sites on the Effectiveness of Detecting New Infections in Baltimore City, 2015-2018. Sexually transmitted diseases	- Not a relevant study design
Nyatsanza, Farai, McSorley, John, Murphy, Siobhan et al. (2016) 'It's all in the message': the utility of personalised short message service (SMS) texts to remind patients at higher risk of STIs and HIV to reattend for testing-a repeat before and after study. Sexually transmitted infections 92(5): 393-5	- Not a relevant study design
Obafemi, Oluyomi A, Wendel, Karen A, Anderson, Teri S et al. (2019) Rapid Syphilis Testing for Men Who Have Sex With Men in Outreach Settings: Evaluation of Test Performance and Impact on Time to Treatment. Sexually transmitted diseases 46(3): 191-195	- Study does not contain a relevant intervention
Orozco-Olvera, Victor; Shen, Fuyuan; Cluver, Lucie (2019) The effectiveness of using entertainment education narratives to promote safer sexual behaviors of youth: A meta-analysis, 1985-2017. PloS one 14(2): e0209969	- No relevant outcomes
Plant, Aaron, Montoya, Jorge A, Rotblatt, Harlan et al. (2010) Stop the sores: the making and evaluation of a successful social marketing campaign. Health promotion practice 11(1): 23-33	- Not a relevant study design
Ronen, Keshet, Golden, Matthew R, Dombrowski, Julia C et al. (2019) Uptake and Impact of Short Message Service Reminders via Sexually Transmitted Infection Partner Services on Human Immunodeficiency	- Study does not contain a relevant intervention

Study	Code [Reason]
Virus/Sexually Transmitted Infection Testing Frequency Among Men Who Have Sex With Men. Sexually transmitted diseases 46(10): 641-647	
Ronen, Keshet, Golden, Matthew R, Dombrowski, Julia C et al. (2019) Uptake and Impact of Short Message Service Reminders via STI Partner Services on HIV/STI Testing Frequency among Men Who Have Sex with Men. Sexually transmitted diseases	- Duplicate reference
Rose, Sally B, Lawton, Beverley A, Bromhead, Collette et al. (2010) Poor uptake of self-sample collection kits for Chlamydia testing outside primary care. Australian and New Zealand journal of public health 34(5): 517-20	- Not a relevant study design
Ross, C, Shaw, S, Marshall, S et al. (2016) Impact of a social media campaign targeting men who have sex with men during an outbreak of syphilis in Winnipeg, Canada. Canada communicable disease report = Releve des maladies transmissibles au Canada 42(2): 45-49	- Not a relevant study design
Roth, Alexis M, Goldshear, Jesse L, Martinez-Donate, Ana P et al. (2016) Reducing Missed Opportunities: Pairing Sexually Transmitted Infection Screening With Syringe Exchange Services. Sexually transmitted diseases 43(11): 706-708	- Study does not contain a relevant intervention
Sagor, Rachel S, Golding, Jeremy, Giorgio, Margaret M et al. (2016) Power of Knowledge: Effect of Two Educational Interventions on Readiness for Chlamydia Screening. Clinical pediatrics 55(8): 717-23	- Population are not the target group
Ten Hoor, Gill, Hoebe, Christian Jpa, van Bergen, Jan Eam et al. (2014) The influence of two different invitation letters on Chlamydia testing participation: randomized controlled trial. Journal of medical Internet research 16(1): e24	- Non-UK healthcare setting
Tuite, Ashleigh R, McCabe, Caitlin J, Ku, Jennifer et al. (2011) Projected cost-savings with herpes simplex virus screening in pregnancy: towards a new screening paradigm. Sexually transmitted infections 87(2): 141-8	- Population are not the target group
van Bergen, Jan E A M, Fennema, Johannes S A, van den Broek, Ingrid V F et al. (2010) Rationale, design, and results of the first screening round of a comprehensive, register-based, Chlamydia screening implementation programme in the Netherlands. BMC infectious diseases 10: 293	- Comparator in study does not match that specified in protocol
van den Broek, Ingrid V F, Hoebe, Christian J P A, van Bergen, Jan E A M et al. (2010) Evaluation design of a systematic, selective, internet-based, Chlamydia screening implementation in the Netherlands, 2008-2010: implications of first results for the analysis. BMC infectious diseases 10: 89	- Duplicate reference
Walker, Jennifer, Fairley, Christopher K, Walker, Sandra M et al. (2010) Computer reminders for Chlamydia screening in general practice: a randomized controlled trial. Sexually transmitted diseases 37(7): 445-50	- Non-UK healthcare setting
Ward, James, Guy, Rebecca J, Rumbold, Alice R et al. (2019) Strategies to improve control of sexually transmissible infections in remote Australian Aboriginal communities: a stepped-wedge, cluster-randomised trial. The Lancet. Global health 7(11): e1553-e1563	- Not applicable to a UK context
Wilson, David P, Heymer, Kelly-Jean, Anderson, Jonathan et al. (2010) Sex workers can be screened too often: a cost-effectiveness analysis in Victoria, Australia. Sexually transmitted infections 86(2): 117-25	- Not applicable to a UK context
Wong, William Chi Wai, Lau, Stephanie Tsz Hei, Choi, Edmond Pui Hang et al. (2019) A Systematic Literature Review of Reviews on the Effectiveness of Chlamydia Testing. Epidemiologic reviews 41(1): 168-175	- Review article but not a systematic review
Yao, Patricia, Fu, Rongwei, Craig Rushing, Stephanie et al. (2018) Texting 4 Sexual Health: Improving Attitudes, Intention, and Behavior Among American Indian and Alaska Native Youth. Health promotion practice 19(6): 833-843	- Not applicable to a UK context
Zenner, Dominik, Molinar, Darko, Nichols, Tom et al. (2012) Should young people be paid for getting tested? A national comparative study to evaluate	- Not a relevant study design

Study	Code [Reason]
patient financial incentives for chlamydia screening. BMC public health 12: 261	
Zhang, Qinya, Huhn, Kim J, Tan, Andy et al. (2017) "Testing is Healthy" TimePlay campaign: Evaluation of sexual health promotion gamification intervention targeting young adults. Canadian journal of public health = Revue canadienne de sante publique 108(1): e85-e90	- Not a relevant study design
Zou, Huachun, Fairley, Christopher K, Guy, Rebecca et al. (2013) Automated, computer generated reminders and increased detection of gonorrhoea, chlamydia and syphilis in men who have sex with men. PloS one 8(4): e61972	- Not a relevant study design
Zou, Huachun, Fairley, Christopher K, Guy, Rebecca et al. (2012) The efficacy of clinic-based interventions aimed at increasing screening for bacterial sexually transmitted infections among men who have sex with men: a systematic review. Sexually transmitted diseases 39(5): 382-7	- Systematic review contains no relevant studies

J.1.2 Excluded qualitative studies

Study	Code [Reason]
Buston, Katie and Wight, Daniel (2010) Self-reported sexually transmitted infection testing behaviour amongst incarcerated young male offenders: findings from a qualitative study. The journal of family planning and reproductive health care 36(1): 7-11	- Does not refer to an intervention
Cassidy, Christine, Steenbeek, Audrey, Langille, Donald et al. (2019) Designing an intervention to improve sexual health service use among university undergraduate students: a mixed methods study guided by the behaviour change wheel. BMC public health 19(1): 1734	- Does not contain qualitative data
Cook, Catherine (2011) 'About as comfortable as a stranger putting their finger up your nose': speculation about the (extra)ordinary in gynaecological examinations. Culture, health & sexuality 13(7): 767-80	- Study was not conducted in the UK
Dang, Michelle T, Amos, Aaron, Dangerfield, Monique et al. (2019) A Youth Participatory Project to Address STIs and HIV among Homeless Youth. Comprehensive child and adolescent nursing 42(3): 222-240	- Study was not conducted in the UK
Freeman, Elaine, Howell-Jones, Rebecca, Oliver, Isabel et al. (2009) Promoting chlamydia screening with posters and leaflets in general practice--a qualitative study. BMC public health 9: 383	- Population are not service users
Hsieh, Y.-H., Lewis, M.K., Viertel, V.G. et al. (2020) Performance evaluation and acceptability of point-of-care Trichomonas vaginalis testing in adult female emergency department patients. International Journal of STD and AIDS	- Does not contain qualitative data
Jafari, Yalda, Johri, Mira, Joseph, Lawrence et al. (2014) Poor Reporting of Outcomes Beyond Accuracy in Point-of-Care Tests for Syphilis: A Call for a Framework. AIDS research and treatment 2014: 465932	- Does not contain qualitative data
Kricka, L.J. and Price, C.P. (2009) Public opinion and experience of point-of-care testing: Results of a small pilot survey. Point of Care 8(4): 160-163	- Does not contain qualitative data
Llewellyn, Carrie, Pollard, Alex, Smith, Helen et al. (2009) Are home sampling kits for sexually transmitted infections acceptable among men who have sex with men?. Journal of health services research & policy 14(1): 35-43	- Published before 2010
Lorimer, K; Reid, M E; Hart, G J (2009) "It has to speak to people's everyday life...": qualitative study of men and women's willingness to participate in a non-medical approach to Chlamydia trachomatis screening. Sexually transmitted infections 85(3): 201-5	- Published before 2010
McDonagh, L.K., Harwood, H., Saunders, J.M. et al. (2020) How to increase chlamydia testing in primary care: a qualitative exploration with	- Does not refer to an intervention

Study	Code [Reason]
young people and application of a meta-theoretical model. Sexually transmitted infections	
Pittman, Ellen, Purcell, Hillary, Dize, Laura et al. (2018) Acceptability and feasibility of self-sampling for the screening of sexually transmitted infections in cabana privacy shelters. International journal of STD & AIDS 29(5): 461-465	- Study was not conducted in the UK
Reed, Jennifer L, Punches, Brittany E, Taylor, Regina G et al. (2017) A Qualitative Analysis of Adolescent and Caregiver Acceptability of Universally Offered Gonorrhea and Chlamydia Screening in the Pediatric Emergency Department. Annals of emergency medicine 70(6): 787-796e2	- Study was not conducted in the UK
Roth, A M, Rosenberger, J G, Reece, M et al. (2013) Expanding sexually transmitted infection screening among women and men engaging in transactional sex: the feasibility of field-based self-collection. International journal of STD & AIDS 24(4): 323-8	- Study was not conducted in the UK
Roth, Alexis M, Rosenberger, Joshua G, Reece, Michael et al. (2012) A methodological approach to improve the sexual health of vulnerable female populations: incentivized peer-recruitment and field-based STD testing. Journal of health care for the poor and underserved 23(1): 367-75	- Study was not conducted in the UK
Roth, Alexis, Van Der Pol, Barbara, Dodge, Brian et al. (2011) Future chlamydia screening preferences of men attending a sexually transmissible infection clinic. Sexual health 8(3): 419-26	- Study was not conducted in the UK
Shoveller, Jean A, Knight, Rod, Johnson, Joy et al. (2010) 'Not the swab!' Young men's experiences with STI testing. Sociology of health & illness 32(1): 57-73	- Study was not conducted in the UK
Sun, Christina J, Stowers, Jason, Miller, Cindy et al. (2015) Acceptability and feasibility of using established geosocial and sexual networking mobile applications to promote HIV and STD testing among men who have sex with men. AIDS and behavior 19(3): 543-52	- Study was not conducted in the UK
Tobin, Karin, Edwards, Catie, Flath, Natalie et al. (2018) Acceptability and feasibility of a Peer Mentor program to train young Black men who have sex with men to promote HIV and STI home-testing to their social network members. AIDS care 30(7): 896-902	- Study was not conducted in the UK
Widdice, Lea E, Hsieh, Yu-Hsiang, Silver, Barbara et al. (2018) Performance of the Atlas Genetics Rapid Test for Chlamydia trachomatis and Women's Attitudes Toward Point-Of-Care Testing. Sexually transmitted diseases 45(11): 723-727	- Study was not conducted in the UK

J.1.3 Excluded economic studies

Reference	Reason for exclusion
Adams EJ, Ehrlich A, Turner KME, Shah K, Macleod J, Goldenberg S, et al. Mapping patient pathways and estimating resource use for point of care versus standard testing and treatment of chlamydia and gonorrhoea in genitourinary medicine clinics in the UK. BMJ open. 2014;4(7):e005322.	Wrong study design
Anonymous. Corrigendum to "Syphilis Screening: A Review of the Syphilis Health Check Rapid Immunochromatographic Test" (Journal of Pharmacy Technology, 33, 2, (53-59), 10.177/8755122517691308). Journal of Pharmacy Technology. 2020;36(2):91.	Systematic review
Atherly A, Blake SC. Efforts by commercial health plans to increase Chlamydia trachomatis screening among their members. Sexually transmitted diseases. 2013;40(1):55-60.	Wrong study design
Bennett C, Knight V, Knox D, Gray J, Hartmann G, McNulty A. An alternative model of sexually transmissible infection testing in men attending a sex-on-premises venue in Sydney: A cross-sectional descriptive study. Sexual Health. 2016;13(4):353-8.	Wrong outcomes

Reference	Reason for exclusion
Bernstein KT, Chow JM, Pathela P, Gift TL. Bacterial Sexually Transmitted Disease Screening Outside the Clinic--Implications for the Modern Sexually Transmitted Disease Program. Sexually transmitted diseases. 2016;43(2suppl1):42-52.	Systematic review
Bissessor L, Wilson J, McAuliffe G, Upton A. Audit of Trichomonas vaginalis test requesting by community referrers after a change from culture to molecular testing, including a cost analysis. The New Zealand medical journal. 2017;130(1457):34-7.	Wrong intervention
Blake DR, Spielberg F, Levy V, Lensing S, Wolff PA, Venkatasubramanian L, et al. Could home sexually transmitted infection specimen collection with e-prescription be a cost-effective strategy for clinical trials and clinical care? Sexually Transmitted Diseases. 2015;42(1):13-9.	Wrong setting
Borkent-Raven BA, Janssen MP, van der Poel CL, Bonsel GJ, van Hout BA. Cost-effectiveness of additional blood screening tests in the Netherlands. Transfusion. 2012;52(3):478-88.	Wrong intervention
Bristow CC, Larson E, Javanbakht M, Huang E, Causer L, Klausner JD. A review of recent advances in rapid point-of-care tests for syphilis. Sexual Health. 2015;12(2):119-25.	Systematic review
Chadwick RC, McGregor K, Sneath P, Rempel J, He BLQ, Brown A, et al. STI initiative: Improving testing for sexually transmitted infections in women. BMJ open quality. 2018;7(4):e000461.	Wrong study design
Chesson HW, Bernstein KT, Gift TL, Marcus JL, Pipkin S, Kent CK. The cost-effectiveness of screening men who have sex with men for rectal chlamydial and gonococcal infection to prevent HIV Infection. Sexually transmitted diseases. 2013;40(5):366-71.	Wrong outcomes
Currie MJ, Schmidt M, Davis BK, Baynes AM, O'Keefe EJ, Bavinton TP, et al. 'Show me the money': financial incentives increase chlamydia screening rates among tertiary students: a pilot study. Sexual health. 2010;7(1):60-5.	Wrong outcomes
Currie MJ, Deeks LS, Cooper GM, Martin SJ, Parker RM, Del Rosario R, et al. Community pharmacy and cash reward: A winning combination for chlamydia screening? Sexually Transmitted Infections. 2013;89(3):212-6.	Wrong outcomes
Das BB, Ronda J, Trent M. Pelvic inflammatory disease: Improving awareness, prevention, and treatment. Infection and Drug Resistance. 2016;9:191-7.	Systematic review
Desai M, Woodhall SC, Nardone A, Burns F, Mercey D, Gilson R. Active recall to increase HIV and STI testing: a systematic review. Sexually transmitted infections. 2015;91(5):314-23.	Systematic review
Eaton EF, Hudak K, Muzny CA. Budgetary Impact of Compliance With STI Screening Guidelines in Persons Living With HIV. Journal of acquired immune deficiency syndromes (1999). 2017;74(3):303-8.	Wrong study design
Eaton EF, Joe W, Kilgore ML, Muzny CA. Reverse syphilis screening algorithm fails to demonstrate cost effectiveness in persons living with HIV. International journal of STD & AIDS. 2018;29(6):563-7.	Wrong outcomes
Estcourt C, Sutcliffe L, Mercer CH, Copas A, Saunders J, Roberts TE, et al. No title provided. 2016.	Systematic review
Friedman AL, Bozniak A, Ford J, Hill A, Olson K, Ledsky R, et al. Reaching Youth With Sexually Transmitted Disease Testing: Building on Successes, Challenges, and Lessons Learned From Local Get Yourself Tested Campaigns. Social marketing quarterly. 2014;20(2):116-38.	Wrong outcomes
Frost JJ, Sonfield A, Zolna MR, Finer LB. Return on investment: a fuller assessment of the benefits and cost savings of the US publicly funded family planning program. The Milbank quarterly. 2014;92(4):696-749.	Wrong intervention
Gamage DG, Fuller CA, Cummings R, Tomnay JE, Chung M, Chen M, et al. Advertising sexual health services that provide sexually transmissible infection screening for rural young people - what works and what doesn't. Sexual health. 2011;8(3):407-11.	Wrong outcomes
Gliddon HD, Peeling RW, Kamb ML, Toskin I, Wi TE, Taylor MM. A systematic review and meta-analysis of studies evaluating the performance	Systematic review

Reference	Reason for exclusion
and operational characteristics of dual point-of-care tests for HIV and syphilis. Sexually transmitted infections. 2017;93(s4):3-s15.	
Guerrero EG, Cederbaum JA. Adoption and utilization of sexually transmitted infections testing in outpatient substance abuse treatment facilities serving high risk populations in the U.S. The International journal on drug policy. 2011;22(1):41-8.	Wrong outcomes
Habel MA, Haderxhanaj L, Hogben M, Eastman-Mueller H, Chesson H, Roberts CM. Does your College Campus GYT? Evaluating the Effect of a Social Marketing Campaign Designed to Raise STI Awareness and Encourage Testing. Cases in public health communication and marketing. 2015;8:51-70.	Wrong setting
Herbst de Cortina S, Bristow CC, Joseph Davey D, Klausner JD. A Systematic Review of Point of Care Testing for Chlamydia trachomatis, Neisseria gonorrhoeae, and Trichomonas vaginalis. Infectious diseases in obstetrics and gynecology. 2016;2016:4386127.	Systematic review
Hislop J, Quayyum Z, Flett G, Boachie C, Fraser C, Mowatt G. Systematic review of the clinical effectiveness and cost-effectiveness of rapid point-of-care tests for the detection of genital chlamydia infection in women and men. Health technology assessment (Winchester, England). 2010;14(29):1-iv.	Systematic review
Hocking JS, Donovan B, Guy R. Matters Arising: Over 150 potentially low-value health care practices: an Australian study. Med J Aust. 2013;198(2):83-4.	Wrong study design
Huang W, Gaydos CA, Barnes MR, Jett-Goheen M, Blake DR. Cost-effectiveness analysis of Chlamydia trachomatis screening via internet-based self-collected swabs compared with clinic-based sample collection. Sexually transmitted diseases. 2011;38(9):815-20.	Wrong outcomes
Huang W, Gaydos CA, Barnes MR, Jett-Goheen M, Blake DR. Comparative effectiveness of a rapid point-of-care test for detection of Chlamydia trachomatis among women in a clinical setting. Sexually transmitted infections. 2013;89(2):108-14.	Wrong intervention
Hull S, Kelley S, Clarke JL. Sexually Transmitted Infections: Compelling Case for an Improved Screening Strategy. Population health management. 2017;20(s1):1-s11.	Systematic review
Huntington SE, Burns RM, Harding-Esch E, Harvey MJ, Hill-Tout R, Fuller SS, et al. Modelling-based evaluation of the costs, benefits and cost-effectiveness of multipathogen point-of-care tests for sexually transmitted infections in symptomatic genitourinary medicine clinic attendees. BMJ open. 2018;8(9):e020394.	Wrong intervention
Jenkins WD, Rabins C, Barnes M, Agreda P, Gaydos C. Use of the internet and self-collected samples as a sexually transmissible infection intervention in rural Illinois communities. Sexual health. 2011;8(1):79-85.	Wrong setting
Jenkins WD, Zahnd W, Kovach R, Kissinger P. Chlamydia and gonorrhea screening in United States emergency departments. The Journal of emergency medicine. 2013;44(2):558-67.	Systematic review
Kanga I, Williams D, Hatchette T, MacKinnon SB, Jung H, Black C, et al. No title provided. 2018.	Systematic review
Kelly C, Johnston J, Carey F. Evaluation of a partnership between primary and secondary care providing an accessible Level 1 sexual health service in the community. International journal of STD & AIDS. 2014;25(10):751-7.	Wrong intervention
Kennedy CE, Spaulding AB, Brickley DB, Almers L, Mirjahangir J, Packel L, et al. Linking sexual and reproductive health and HIV interventions: A systematic review. Journal of the International AIDS Society. 2010;13(1):26.	Systematic review
Knight V, Ryder N, Guy R, Lu H, Wand H, McNulty A. New Xpress sexually transmissible infection screening clinic improves patient journey and clinic capacity at a large sexual health clinic. Sexually transmitted diseases. 2013;40(1):75-80.	Wrong intervention
Lewis FM, Schillinger JA, Taylor M, Brewer TH, Blank S, Mickey T, et al. Needle in a haystack: the yield of syphilis outreach screening at 5 US sites-	Wrong setting

Reference	Reason for exclusion
2000 to 2007. Journal of public health management and practice : JPHMP. 2011;17(6):513-21.	
Malaysian Health Technology A. Point-Of-Care test for Chlamydia. Putrajaya: Malaysian Health Technology Assessment (MaHTAS). 2012.	Systematic review
Nelson Hd ZBCADMPM. Screening for gonorrhea and chlamydia: systematic review to update the U.S. Preventive Services Task Force Recommendations. Agency for Healthcare Research and Quality (AHRQ). 2014.	Systematic review
Niza C, Rudisill C, Dolan P. Vouchers versus Lotteries: What Works Best in Promoting Chlamydia Screening? A Cluster Randomized Controlled Trial. Applied Economic Perspectives and Policy. 2014;36(1):109-24.	Wrong study design
Orozco-Olvera V, Shen F, Cluver L. The effectiveness of using entertainment education narratives to promote safer sexual behaviors of youth: A meta-analysis, 1985-2017. PloS one. 2019;14(2):e0209969.	Systematic review
Owusu-Edusei K PTABRC. Serologic testing for syphilis in the United States: a cost-effectiveness analysis of two screening algorithms. Sexually Transmitted Diseases. 2011;38(1):1-7.	Wrong study design
Owusu-Edusei K, Jr., Hoover KW, Gift TL. Cost-Effectiveness of Opt-Out Chlamydia Testing for High-Risk Young Women in the U.S. American journal of preventive medicine. 2016;51(2):216-24.	Wrong setting
Page C, Mounsey A, Rowland K. Is self-swabbing for STIs a good idea? Journal of Family Practice. 2013;62(11):651-3.	Wrong study design
Palmer MJ, Henschke N, Villanueva G, Maayan N, Bergman H, Glenton C, et al. Targeted client communication via mobile devices for improving sexual and reproductive health. Cochrane Database of Systematic Reviews. 2020;2020(8):cd013680.	Systematic review
Peterman TA, Fakile YF. What Is the Use of Rapid Syphilis Tests in the United States? Sex Transm Dis. 2016;43(3):201-3.	Systematic review
Read PJ, Knight V, Bourne C, Guy R, Donovan B, Allan W, et al. Community event-based outreach screening for syphilis and other sexually transmissible infections among gay men in Sydney, Australia. Sexual health. 2013;10(4):357-62.	Wrong outcomes
Rukh S, Khurana R, Mickey T, Anderson L, Velasquez C, Taylor M. Chlamydia and gonorrhea diagnosis, treatment, personnel cost savings, and service delivery improvements after the implementation of express sexually transmitted disease testing in Maricopa County, Arizona. Sexually transmitted diseases. 2014;41(1):74-8.	Wrong setting
Shih SL, Graseck AS, Secura GM, Peipert JF. Screening for sexually transmitted infections at home or in the clinic? Current opinion in infectious diseases. 2011;24(1):78-84.	Systematic review
Taylor MM, Frasure-Williams J, Burnett P, Park IU. Interventions to Improve Sexually Transmitted Disease Screening in Clinic-Based Settings. Sexually transmitted diseases. 2016;43(2suppl1):28-41.	Systematic review
Turner K, Adams E, Grant A, Macleod J, Bell G, Clarke J, et al. Costs and cost effectiveness of different strategies for chlamydia screening and partner notification: an economic and mathematical modelling study. BMJ (Clinical research ed). 2011;342:c7250.	Wrong outcomes
Turner KME, Round J, Horner P, Macleod J, Goldenberg S, Deol A, et al. An early evaluation of clinical and economic costs and benefits of implementing point of care NAAT tests for Chlamydia trachomatis and Neisseria gonorrhoea in genitourinary medicine clinics in England. Sexually transmitted infections. 2014;90(2):104-11.	Wrong outcomes
Turner KME, Looker KJ, Syred J, Zienkiewicz A, Baraitser P. Online testing for sexually transmitted infections: A whole systems approach to predicting value. PloS one. 2019;14(2):e0212420.	Wrong outcomes
van Bergen JEAM, Fennema JSA, van den Broek IVF, Brouwers EEHG, de Feijter EM, Hoebe CJPA, et al. Rationale, design, and results of the first screening round of a comprehensive, register-based, Chlamydia screening	Wrong outcomes

Reference	Reason for exclusion
implementation programme in the Netherlands. BMC infectious diseases. 2010;10:293.	
Verougstraete N, Verbeke V, De Canniere AS, Simons C, Padalko E, Coorevits L. To pool or not to pool? Screening of Chlamydia trachomatis and Neisseria gonorrhoeae in female sex workers: Pooled versus single-site testing. Sexually Transmitted Infections. 2020;96(6):417-21.	Wrong outcomes
Wilson DP, Heymer K-J, Anderson J, O'Connor J, Harcourt C, Donovan B. Sex workers can be screened too often: a cost-effectiveness analysis in Victoria, Australia. Sexually transmitted infections. 2010;86(2):117-25.	Wrong study design
Wong WCW, Lau STH, Choi EPH, Tucker JD, Fairley CK, Saunders JM. A Systematic Literature Review of Reviews on the Effectiveness of Chlamydia Testing. Epidemiologic reviews. 2019;41(1):168-75.	Systematic review
Zhang Q, Huhn KJ, Tan A, Douglas RE, Li HG, Murti M, et al. "Testing is Healthy" TimePlay campaign: Evaluation of sexual health promotion gamification intervention targeting young adults. Canadian journal of public health = Revue canadienne de sante publique. 2017;108(1):e85-e90.	Wrong outcomes

Appendix K – Research recommendations – full details

K.1.1 Research recommendation

Have people's attitudes to remote self-sampling and regular testing for STIs changed as a result of self-sampling for covid?

Why this is important

The committee discussed remote self-sampling and agreed that the covid pandemic had made people much more familiar with remote self-sampling and self-testing. They speculated that this may have changed attitudes to remote self-sampling which could make these tests more accessible to people and reduce their concerns about using them. This could broaden access to these tests.

Rationale for research recommendation

Importance to 'patients' or the population	Remote self-sampling is a convenient and simple way to test asymptomatic people for some STIs. It helps avoid some of the stigma and embarrassment that may be associated with attending a sexual health service.
Relevance to NICE guidance	COVID has led to a large increase in remote self-sampling for STIs however, there is a lot of wastage due to high numbers of unreturned kits. More information about the acceptability of these kits would enable smarter commissioning.
Relevance to the NHS	Remote self-sampling reduces the number of people who need to attend in-person and frees up resource for seeing and treating symptomatic people.
National priorities	DHSC will publish a new sexual health strategy in winter 2021
Current evidence base	No data about the effects of COVID-19 on self-sampling acceptability
Equality considerations	Self-sampling may reduce inequalities by enabling people who would not access in-person services to get an STI test

SPIDER table

Setting	Non-clinical setting
Phenomenon of interest	Remote self-sampling for STIs (including HIV)
Design	Interviews or focus groups
Evaluation	Change in acceptability and attitudes towards remote self-sampling since COVID-19
Research design	Qualitative

K.1.2 Research recommendation

What are the effectiveness and adverse outcomes of self-sampling for people with symptoms that could indicate an STI, if remote triage (for example phone triage) indicates that this is appropriate?

Why this is important

The committee were aware that during the COVID pandemic some areas had been offering remote self-sampling STI tests to people who had symptoms of an STI and who were assessed by telephone triage as appropriate for self-sampling. Current best practice is only to offer remote self-sampling to people who do not have STI symptoms. If symptomatic self-sampling is effective and safe then it could indicate a step change in STI testing.

Rationale for research recommendation

Importance to 'patients' or the population	Currently remote self-sampling is only offered to people who are asymptomatic. People who have symptoms need to visit a sexual health service or GP clinic for testing and diagnosis. This may cause embarrassment, shame and risk to some people.
Relevance to NICE guidance	No evidence currently exists to support this practice however, anecdotally it has been successful in some places during the COVID 19 pandemic. This may affect future iterations of this guideline.
Relevance to the NHS	The opportunity to deliver more testing remotely would lower pressure on sexual health services and allow them more time to focus on treating STIs and PN.
National priorities	DHSC will publish a new sexual health strategy in winter 2021
Current evidence base	No data about the effects of self-sampling on outcomes for people with STI symptoms.
Equality considerations	Self-sampling may reduce inequalities by enabling people who would not access in-person services to get an STI test

Modified PICO table

Population	People with symptoms where an STI is part of the differential diagnosis
Intervention	Telephone triage followed by remote self-sampling
Comparator	Standard sexual health clinic testing
Outcome	Uptake of testing Rate of diagnoses of STI Adverse events/unintended consequences Cost-effectiveness/utility
Study design	Randomised controlled trial or cluster randomised controlled trial
Timeframe	Medium term (6-12 month follow up)

Additional information	None

K.1.3 Research recommendation

What incentives are effective and cost effective in increasing STI testing and diagnosis, and what are the adverse and unintended consequences?

Why this is important

Qualitative data implies that incentives may be useful in terms of improving the acceptability of STI testing, however the quantitative data is unclear about their value. The committee were also concerned about the risks of providing a 'perverse incentive', that is offering an incentive may encourage people to get an STI so that they can get an incentive to test for it and treat it.

Rationale for research recommendation

Importance to 'patients' or the population	Incentives may increase uptake of STI testing, which would reduce the prevalence of undiagnosed/untreated infection in the population.
Relevance to NICE guidance	The committee was unable to take an informed view on whether or not to recommend incentives and agreed this was a gap in the guideline they would like to address in future versions.
Relevance to the NHS	The outcome would affect interventions to increase the uptake of STI testing and early diagnosis which would reduce the overall burden on the health system.
National priorities	DHSC will publish a new sexual health strategy in winter 2021
Current evidence base	Two studies (Dolan 2014 and Niza 2014) provided low quality inconclusive quantitative evidence about the effectiveness of incentives in young people.
Equality considerations	Incentives may reduce inequalities by attracting people from lower socioeconomic groups to get an STI test

Modified PICO table

Population	People at high risk of contracting an STI
Intervention	Incentives for taking an STI test
Comparator	Normal practice, or other incentive types
Outcome	Uptake of testing Positivity rates Adverse consequences
Study design	RCT or mixed methods
Timeframe	Medium term
Additional information	None

K.1.4 Research recommendation

What are the experiences of LGBT+ people in accessing STI testing services, including online?

Why this is important

The committee considered the accessibility of STI testing services, including self-sampling and remote self-testing, and were interested in the experiences of LGBT+ people in accessing these services. They noted that existing practice is that tests are available for men, women, or MSM, and that people usually have to complete a triage questionnaire to access remote testing services. The committee recognised that this does not meet the needs of trans, non-binary and gender diverse people who may be unsure how to answer questions about their gender or the type of sex they are having in order to access the right self-testing kit. It was noted that visiting a clinic may be preferable for some trans, non-binary and gender diverse people, but also that some clinics can be very gendered or potentially stigmatising, so it was unclear what LGBT+ people's experiences of accessing STI testing services were.

Rationale for research recommendation

Importance to 'patients' or the population	Accessing STI testing is key to detecting and treating STIs but some LGBT+ people may be reluctant to go to sexual health clinics. While self-sampling and remote self-testing services may be preferable for some LGBT+ people, they may find it difficult to know which test kit to use based on their genitalia, gender identity, or the type of sex they have. This may lead to inaccurate testing or may prevent them from taking the tests.
Relevance to NICE guidance	The committee were unable to make specific recommendations about how to ensure self-sampling and self-testing kits should be made available to best meet the needs and preferences of LGBT+ people. Further research might enable future updates of this guideline to address the issue.
Relevance to the NHS	Improving services for LGBT+ people may make the people who are most at risk more likely to access the services and improve their sexual wellbeing.
National priorities	Medium
Current evidence base	No evidence
Equality considerations	This research could reduce inequalities in sexual health by improving access to STI testing for LGBT+ people.

SPIDER table

Setting	Non-clinical setting
Phenomenon of interest	LGBT+ people's experiences of STI testing services, including clinic-based, remote self-testing, and self-sampling
Design	Interviews or focus groups
Evaluation	Views, experiences, preferences and acceptability towards STI testing

Research design	Qualitative