National Institute for Health and Care Excellence

Final

Reducing sexually transmitted infections (STIs)

[E] Partner notification methods to prevent or reduce STIs

NICE guideline NG221

Evidence reviews underpinning recommendations 1.3.1 to 1.3.6 in the NICE guideline

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National Institute for Health and Care Excellence

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1.1 Review question

What partner notification methods for STIs are effective and cost-effective for reducing STIs?

1.1.1 Introduction

STI incidence increased by 5% from 2017 to 2018, which may lead to a decrease in quality of life for more people and increased STI-related morbidity. One method to reduce STI rates is partner notification, which makes sexual partners of infected people know they may be at risk of an STI. If people are aware of possible infection they can get tested and treated preventing onward transmission and re-infection of partners. Current practice is to tell people who have been diagnosed with an STI to let their partners know of their diagnosis and to refer them to a clinic to get tested themselves. There are different ways to notify partners but there is uncertainty surrounding which methods would most effectively reduce re-infection rates and improve testing and treatment rates in partners.

Views on which methods are most acceptable are important to the success of partner notification. If people do not feel comfortable with the method presented to them, they are unlikely to let their partners know of possible infection. Informing partners digitally is now an option but it is not known if people would be receptive to this form of partner notification. In addition, different populations may find some methods more acceptable than others due to their beliefs and attitudes towards sexual behaviour and STIs.

1.1.2 Summary of the protocol

Table 1: PICO inclusion criteria

Eligibility criteria	Content
Population	People from age 16 and over that have been recently diagnosed with an STI (index patients), and/or their sexual partners.

Interventions	Partner notification or contact tracing methods, including:
	• Provider referral
	• Patient referral
	  ○ Simple patient referral
	  ○ Enhanced patient referral
	• Contract (or conditional) referral
	• Accelerated partner therapy
	• Electronic partner notification (ePN)

Comparator	Other partner notification intervention Additional counselling No partner notification

Outcomes	**Primary outcomes:**
	• STI re-infection
	• Number of partners/sexual contacts:
	  ○ identified
	  ○ notified
	  ○ attended (verified by healthcare professional or if contacts reported attendance)
	  ○ tested
	  ○ diagnosed

Eligibility criteria	Content
	○ treated ○ untraceable **Secondary outcomes:** • Condom use • Quality of life

The full protocol is available in 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.

One included study was a 3-arm trial (Estcourt 2015): 2 intervention arms compared to a control arm. To prevent double counting of control participants, the total number of participants and number of events in the control group were divided by 2. The halved amounts were included in comparisons between APTHotline and control, and APTPharmacy and control. This method allows the total number of participants to be counted correctly while maintaining accurate relative comparisons between arms.

Three other included studies were 3-arm trials (Cameron 2009, Kissinger 2006, and Kissinger 2005) which all included one arm featuring patient-delivered partner therapy (PDPT). PDPT, also known as expedited partner therapy, is the practice of providing prescriptions or medications to the index patient to take to their partner without a healthcare provider first medically assessing the partner. It is not currently used in the UK because it fails to comply with current UK prescribing guidance so is excluded from this review. The results for the PDPT arms were not extracted from these trials and no correction was applied to the control group.

Declarations of interest

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

1.1.4 Identification of public health evidence

The effectiveness and qualitative studies were identified using a single combined literature search (Appendix B). 2,840 records were identified for title and abstract screening and 25 quantitative papers were ordered for full text review. Of these, 8 RCTs met the inclusion criteria for the effectiveness review, as outlined in the review protocol, and 17 studies were excluded. See Appendix C for a PRISMA flow diagram of the study selection process.

1.1.4.1 Included studies

Of the 8 RCTs identified, 4 were based in the USA, 3 were UK-based, and 1 was from Australia. 5 studies had only female index patients, 1 had only male index patients and the other 2 were mixed sex samples. 4 studies reported re-infection rates and 4 reported on the number of partners contacted. 2 studies reported the number of partners treated. Concerning subgroups specified in the protocol, 4 studies had a high proportion of people from a Black African or Caribbean family background and 3 studies included a high proportion of young people. All other subgroups were not covered. See table 2 for included study details for the effectiveness review.

1.1.4.2 Excluded studies

The full list of excluded studies and reasons for exclusion are listed in Appendix K.

Table 2. Summary of effectiveness studies included in the evidence review

Study	Setting	Population and number of participants	Intervention	Comparator	Outcome(s)
Apoola 2009	UK Sexual health clinic	Women with chlamydia 200 participants, young people	Enhanced Patient Referral: Urine testing kit and referral slip given to male sex partners by index patients	Simple Patient Referral with standard contact slips	Number of partners identified. Number of partners contacted. Number of partners treated.
Cameron 2009	Edinburgh, UK Sexual health clinics	Women with chlamydia 330 participants, young people	Enhanced Patient Referral: Postal testing kits delivered to male sex partners	Simple Patient Referral with standard contact slips	Number of index patients re-infected. Number of men tested and diagnosed. Number of women who contacted partners.
Estcourt 2015	East London and south coast, UK General practices, community contraception and sexual health services	Women with chlamydia 313 participants, young people	Accelerated Partner Therapy: APTHotline: sex partners are invited to call for a telephone consultation APTPharmacy: sex partners are invited to attend a consultation with a pharmacist	Simple Patient Referral (with or without contact slips depending on the service or HCP)	Number of index patients re-infected. Number of partners notified and treated.
Kissinger 2005	Louisiana, USA Sexual health clinics	Men with urethritis 977 participants, 95% African American	Simple Patient Referral using contact slips from a booklet	Simple Patient Referral without contact slips	Number of index patients who spoke to their partner about infection. Number of index patients who checked if partner was treated. Number of partners who notified the index patient they were treated.

Study	Setting	Population and number of participants	Intervention	Comparator	Outcome(s)
					Number of index patients who had unprotected sex before their partner was treated, or sex with any partner.
Kissinger 2006	Louisiana, USA Sexual health clinics	Women with Trichomonas vaginalis 302 participants, 99.1% from a Black African or Caribbean family background	Simple Patient Referral using contact slips from a booklet	Simple Patient Referral without contact slips	Number of index patients who spoke to partner about infection. Number of index patients who checked if partner was treated. Number of partners who notified index patients they were treated. Number of index patients who had unprotected sex before partner was treated, or with any partner.
Schwebke 2010	Alabama, USA STI clinic	Women with Trichomonas vaginalis 322 participants, 94.8% from a Black African or Caribbean family background	Provider Referral: Accelerated consultation and therapy for partners	Simple Patient Referral without contact slips	Number of index patients re-infected.
Tomnay 2006	Melbourne, Australia Sexual health clinic	People with chlamydia or non-gonococcal urethritis 105 participants	Enhanced Patient Referral by standard notification letter plus informational website on chlamydia and non-gonococcal urethritis for partner	Simple Patient Referral with standard notification letter	Number of index patients traced all or any partners.

Study	Setting	Population and number of participants	Intervention	Comparator	Outcome(s)
Wilson 2009	New York City, USA STI clinics	People with chlamydia or gonorrhoea 600 participants; 40% African American and 52% African Caribbean	Enhanced Patient Referral: Index patient counselling, pamphlet on partner notification, and referral slips for partners	Simple Patient Referral with referral slips	Number of index patients re-infected. Number of index patients notified at least 1 partner. Number of index patients who had unprotected intercourse.

Notes.
APT: accelerated partner therapy; cRCT: cluster randomised controlled trial; HCP: healthcare practitioner; ED emergency departments; EPT: expedited partner therapy; PN: partner notification
Index patients in "simple patient referral" arms were told to tell their partners about possible infection and to get tested, but no other action was taken unless stated.

See appendix D for full evidence tables.

1.1.5 Summary of the effectiveness evidence

Table 3: Summary of findings table

Outcomes	Illustrative comparative risks* (95% CI) Assumed risk Control	Corresponding risk Intervention	Relative effect (95% CI)	No of Participants (studies)	Quality of the evidence (GRADE)	Comments
STI re-infection in index patient Simple patient referral vs Enhanced patient referral	**87 per 1000**	**82 per 1000** (21 to 320)	**RR 0.94** (0.24 to 3.67)	710 (2 studies)	⊕⊖⊖⊖ **very low**[1,2,3]	Cameron 2009 Wilson 2009
STI re-infection in index patient Simple patient referral vs Provider referral Follow-up: 1 month	**98 per 1000**	**150 per 1000** (69 to 326)	**RR 1.53** (0.71 to 3.33)	192 (1 study)	⊕⊖⊖⊖ **very low**[4,3]	Schwebke 2010
STI re-infection in index patient Simple patient referral vs Provider referral Follow-up: 3 months	**50 per 1000**	**78 per 1000** (19 to 313)	**RR 1.56** (0.39 to 6.26)	124 (1 study)	⊕⊖⊖⊖ **very low**[4,3]	Schwebke 2010
Number of sex partners contacted Simple patient referral vs Enhanced patient referral	**388 per 1000**	**392 per 1000** (346 to 443)	**RR 1.01** (0.89 to 1.14)	1105 (3 studies)	⊕⊕⊖⊖ **low**[1,5]	Cameron 2009 Estcourt 2015 (2 arms) Wilson 2009

Number of sex partners contacted Patient referral with contact slips vs patient referral without contact slips	**572 per 1000**	**578 per 1000** (504 to 664)	**RR 1.01** (0.88 to 1.16)	1588 (2 studies)	⊕⊖⊖⊖ **very low**[6,7,5]	Kissinger 2005 Kissinger 2006
Number of sex partners treated Simple patient referral vs Enhanced patient referral	**559 per 1000**	**515 per 1000** (436 to 604)	**RR 0.92** (0.78 to 1.08)	513 (2 studies)	⊕⊕⊖⊖ **low**[8,9]	Apoola 2009 Estcourt 2015 (2 arms)
Number of sex partners treated Patient referral with contact slips vs patient referral without contact slips	**425 per 1000**	**442 per 1000** (276 to 697)	**RR 1.04** (0.65 to 1.64)	1588 (2 studies)	⊕⊖⊖⊖ **very low**[6,10,3]	Kissinger 2005 Kissinger 2006
Number of sex partners tested Patient referral with contact slips vs Enhanced patient referral (postal testing kits)	**343 per 1000**	**412 per 1000** (299 to 563)	**RR 1.2** (0.87 to 1.64)	258 (1 study)	⊕⊕⊖⊖ **low**[11,9]	Cameron 2009
Number of sex partners diagnosed with an STI Patient referral with contact slips vs Enhanced patient referral (postal testing kits)	**149 per 1000**	**249 per 1000** (151 to 415)	**RR 1.67** (1.01 to 2.78)	258 (1 study)	⊕⊕⊖⊖ **low**[11,12]	Cameron 2009
Unprotected sex at 4 weeks Patient referral with contact slips vs patient referral without contact slips	**280 per 1000**	**263 per 1000** (215 to 324)	**RR 0.94** (0.77 to 1.16)	935 (2 studies)	⊕⊕⊖⊖ **low**[6,9]	Kissinger 2005 Kissinger 2006
Number of sex partners traced Patient referral with standard letter vs patient referral with standard letter plus informational website for partners	**725 per 1000**	**630 per 1000** (529 to 761)	**RR 0.87** (0.73 to 1.05)	230 (1 study)	⊕⊖⊖⊖ **very low**[9,13]	Tomnay 2006

*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] Downgraded for some concerns of bias for missing outcome data, measurement of outcome and the trials were not registered
[2] Downgraded due to high I^2 = 86%
[3] Downgraded twice as 95%CI crosses line of no effect and 2MIDs
[4] Downgraded for high risk of bias due to effect of assignment to intervention
[5] Downgraded once as 95%CI crosses line of no effect
[6] Downgraded for some concerns of bias for one study due to high attrition and differential attrition by intervention arm; some concerns of bias for one study due to randomisation; and both trials not registered.
[7] Downgraded due to high I^2 = 73%
[8] Downgraded for some concerns of bias due to randomisation process, missing outcome data, and trials were not registered
[9] Downgraded once as 95%CI crosses line of no effect and 1MID
[10] Downgraded twice due to high I^2 = 94%
[11] Downgraded for some concerns of bias due to missing outcome data and trial not registered
[12] Downgraded once as 95%CI crosses 1MID
[13] Downgraded for high risk of bias due to deviations from intended interventions

Full GRADE tables are available in Appendix F.

1.1.5 Economic evidence

A search for relevant economic studies was undertaken, using the strategy in appendix B and applying a cost-effectiveness filter. 384 references were identified from this literature search; of which 365 were excluded during title and abstract screening. On full paper inspection 18 of these studies did not to meet the inclusion criteria, leaving 1 included cost-utility study, on partner notification for people newly diagnosed with HIV.

1.1.5.1 Included studies

The study included was a Dutch cost-utility analysis of partner notification for people with HIV. The intervention was an online partner notification tool (Suggest-A-Test). After a patient is diagnosed, there was an intensive counselling process at the STI clinic in which partner notification was discussed. Patients chose whether to contact their partners on their own or through the Suggest-A-Test system (most chose to notify partners outside the tool). For an HIV diagnosis, it was advised that the patient notifies all partners from the last 12 months and longer if possible. More detailed information on the study can be found in Appendix I, and the study selection is described in Appendix H.

1.1.5.2 Excluded studies

Details of the studies excluded at full-text screening are given in Appendix K.

1.1.6 Summary of included economic evidence

Study	Comparators	Costs differences	QALY differences	ICER	Uncertainty	Applicability	Limitations
Nichols 2015 Cost utility analysis Third-party-payer perspective Markov model 20-year time horizon	**Treat at CD4 cell count <500 cells/µl (5% of patients diagnosed via partner notification)**				Univariate sensitivity analyses were conducted on discount rates (for costs and QALYs), the effectives of partner notification, and the costs of ART and HIV testing. Changes in discount rates resulted in smaller changes than changes in either effectiveness or costs. Analyses were also presented at 5, 10- and 15-year time horizons. Partner notification was less cost-effective at these time horizons than at 20 years, but still highly likely to be	Partially applicable	Minor limitations
	Partner notification versus usual care	€8,499,662	1,519	€5,887/QALY			
	Treat at CD4 cell count <500 cells/µl (20% of patients diagnosed via partner notification)						
	Partner notification versus usual care	€32,005,785	5,773	€5,773/QALY			
	Immediate treatment (5% of patients diagnosed via partner notification)						

Study	Comparators	Costs differences	QALY differences	ICER	Uncertainty	Applicability	Limitations
	Partner notification versus usual care	€8,363,538	1,517	€5,719/QALY	cost-effective as long as the time horizon is at least 10 years. Probabilistic sensitivity analysis was not conducted for cost and QALYs, but the simulation approach already appropriately captures this data for HIV dynamics.		
	Immediate treatment (20% of patients diagnosed via partner notification)						
	Partner notification versus usual care	€31,372,511	5,830	€5,616/QALY			

1.1.7 Economic model

No economic modelling was undertaken for this review question. The model structure developed for the review question on increasing update of STI testing could in principle, but the committee agreed that none of the evidence from the clinical review enabled modelling that would provide additional useful evidence for making recommendations.

1.1.8 Cost-effectiveness evidence statements

Partially applicable evidence with minor limitations from the Netherlands found that the use of an online partner notification tool, preceded by counselling on partner notification at an STI clinic, was a cost-effective intervention compared to usual care for people newly diagnosed with HIV.

2 Acceptability of partner notification methods

2.1 Review question

What is the acceptability of partner notification methods for reducing STIs?

2.1.1 Introduction

One method to reduce STI rates is partner notification, which makes sexual partners of infected people know they may be at risk of an STI. Different methods of partner notification are available to index patients but views on which methods are most acceptable are important to the success of partner notification. If people do not feel comfortable with the method presented to them, they are unlikely to let their partners know of possible infection. Informing partners digitally is now an option but it is not known if people would be receptive to this form of partner notification. In addition, different populations may find some methods more acceptable than others due to their beliefs and attitudes towards sexual behaviour and STIs.

2.1.2 Summary of the protocol

Table 4: PICO inclusion criteria

Eligibility criteria	Content
Population	People from age 16 and over that have been recently diagnosed with an STI (index patients), and/or their sexual partners.
Interventions	Acceptability factors that may impact on partner notification methods. These may include interventions or strategies identified in the effectiveness review but is not restricted to these.
Comparator	Not applicable
Outcomes	• The values, beliefs, preferences, acceptability, attitudes, experiences and views of the approaches to partner notification. • The acceptability of partner notification on index patients and their sexual partner(s). • Any adverse effects of partner notification.

The full protocol is available in 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 Identification of qualitative evidence

The effectiveness and qualitative studies were identified using a single combined literature search (Appendix B). 2,840 records were identified for title and abstract screening and 35 qualitative papers were ordered for full text review. Of these, 10 qualitative studies met the inclusion criteria for the qualitative review, as outlined in the review protocol, and 25 studies were excluded. See Appendix C for a PRISMA flow diagram of the study selection process.

2.1.4.1 Included studies

For the 10 qualitative studies, 4 were of gay, bisexual and other men who have sex with men, and 3 were of people from a Black African or Caribbean family background. Of the 3 studies of people from a Black African or Caribbean family background, 2 were in a Black population that would not be considered an ethnic minority in their countries (Kenya, and Malawi and Zambia); the other study was from South Africa and was classed as featuring a Black and ethnic minority population because of the inequalities for Black people in South Africa although they are the majority. Most studies described people's views on partner notification generally but then reported people's experiences and views of specific methods of partner notification (e.g. patient referral, provider referral). See table 5 for included study details for the qualitative review.

2.1.4.2 Excluded studies

The full list of excluded studies and reasons for exclusion are listed in Appendix K.

Table 5. Summary of qualitative studies included in the evidence review

Study	Setting	Country	Design and analysis	Population and number included in study	Objective	CASP Risk of Bias
Cavalcante 2016	Healthcare centres	Fortaleza, Brazil	Semi-structured interviews Collective subjective discourse (CSD) technique	People recently diagnosed with an STI and their sex partners. Index patients and partners were interviewed separately. 21 participants (11 index patients and 10 notified partners)	To understand the perceptions, experiences and choices of people with STIs notifying partners and sexual partners who are notified.	Low risk of bias
Coleman 2007	Participants recruited from GUM clinics, bars, clubs and a sauna. Interviews conducted in university or clinical settings	Greater Dublin Area, Ireland	Semi-structured interviews Systematic thematic analysis	MSM who had recently been diagnosed with syphilis, their sexual contacts, and other MSM from gay venues. 40 participants (15 index patients, 15 sexual contacts and 10 non-clinical participants).	To explore MSM's attitude to, and experiences of, partner notification	Low risk of bias
Contesse 2019	Online focus groups	USA	Online focus groups Content analysis	MSM who meet sex partners through geosocial networking (GSN) apps 28 participants, ethnically diverse.	To understand the views of MSM on the acceptability of using GSN to notify sex partners.	Low risk of bias

Study	Setting	Country	Design and analysis	Population and number included in study	Objective	CASP Risk of Bias
Goyette 2016	Health facilities offering APT through a cRCT	Kenya	In-depth interviews and focus group discussions	People who declined enrolment in the APS cRCT who were newly diagnosed with HIV. 20 participants, aged between 30 and 47.	To explore barriers to implementing assisted partner services (APS) from the point of view of client, community and the health system.	Low risk of bias
Hershow 2019	Hospital antenatal and maternity clinics.	Lilongwe, Malawi and Lusaka, Zambia	Semi-structured interviews	Pregnant and postpartum women, their partners, and maternity-related healthcare workers who provide HIV prevention services. 133 participants, 29 were newly HIV positive women and 37 were their partners. Other patients were HIV negative (newly tested) and their partners.	To assess the perceived acceptability and preferences of 3 different male partner HIV testing modalities and the perceived acceptability of a choice-based approach for male partner HIV testing in antenatal settings among a range of stakeholders.	Low risk of bias
Hopkins 2010	Sexual health centres and general practices	Australia	Semi-structured telephone interviews	People recently diagnosed with chlamydia, 65% were 18-25 years old. 40 participants, 25 females.	To determine methods used by participants to contact their partners, the reasons for choosing them, and their opinions of various partner notification methods including new technologies (email, SMS and the internet).	Low risk of bias

Study	Setting	Country	Design and analysis	Population and number included in study	Objective	CASP Risk of Bias
Lessard 2019	Community	Paris, Lyon and Nice, France	Focus groups	MSM taking PrEP, community mediators, physicians and decision-makers 42 participants. 21 were PrEPers, 38% of which had had 2 or more STIs in the previous 12 months.	To obtain stakeholders' views on the acceptability of WeFLASH, a digital smartphone PN tool to be released to French HIV pre-exposure prophylaxis users.	Low risk of bias
Reed 2015	Adult and paediatric ED	Cincinnati, USA	Semi-structured interviews Framework analysis	Adolescents and young adults from a Black family background (aged 14-21) attending the ED with STI-related complaints. 40 participants	To explore the barriers to and preferences for partner notification and treatment among adolescent males and females tested for STIs, and to explore the acceptability of ED personnel notifying their partners.	Low risk of bias
Tomnay 2017	Sexual health services, tertiary hospital specialising in HIV clinical care and a GP with a high proportion of MSM patients.	Australia	Semi-structured interviews Thematic analysis using a combined deductive/inductive approach	MSM recently diagnosed with HIV. 15 participants	To understand how PN is carried out by MSM recently diagnosed with HIV and to identify barriers and enablers of PN. It also explored whether and how future development of a website to assist HIV PN might be helpful.	Low risk of bias
Wood 2018	Township with high STI and HIV prevalence.	South Africa	Recordings of PN counselling sessions	People recently diagnosed with an STI aged 19 to 41 years.	To explore barriers to PN and their perceptions about effective PN	Low risk of bias

Study	Setting	Country	Design and analysis	Population and number included in study	Objective	CASP Risk of Bias
				30 participants	strategies for people who have contracted STIs.	

See appendix D for full evidence table

2.1.5 Summary of the qualitative evidence

Iterative aggregation of codes generated 6 key themes relating to the acceptability of partner notification methods. A summary of these qualitative findings is presented in Table 6. Full CERQual tables are presented in Appendix G.

Table 6: Summary of qualitative findings

Summary of review finding	Studies contributing to the review finding	Illustrative quotes	CERQual assessment	Explanation of GRADE-CERQual assessment
Relationship status between index patient and partner influences acceptability of methods Participants agreed that the acceptability of PN methods depends on the relationship between partners. Participants felt a moral responsibility to tell partners face-to-face if they had a more intimate or regular relationship with them. There was disagreement between participants on which methods to use for casual partners. Some participants felt that it was sufficient to notify less regular partners via a phone call, SMS or provider referral, while others felt that notifying in person was the best method in any situation regardless of relationship status.	Cavalcante 2016 Coleman 2007 Contesse 2019 Goyette 2016 Hopkins 2010 Lessard 2019 Reed 2015 Tomnay 2017 Wood 2018	*"It seemed like the right thing to do. I think he deserved for me to tell him with him there and not just call him up."* *"...I felt more comfortable that I could see their reaction and it was just more courteous to tell them to their face."* *"I would SMS someone if it was a one-night stand and I didn't really care about them. I would be just letting them know."* *""It (email) is so informal. I think if you're going to tell somebody you have an STI you need to show a good enough level of respect to tell them in person, especially if they are going to take you seriously and go and get treated."*	Moderate confidence	Downgraded because although there were an adequate number of studies that contributed to the finding, the studies did not always agree with each other
Ease and practicality of notifying partners Practical aspects of PN were considered important. Face-to-face patient referral was the preferred method because it is quick and reliable, but participants understood that this is not always possible. Phone calls were used when people thought speed was necessary. Letters, emails, and SMS were seen as acceptable only when face-to-face or phone calls were not possible because partners were difficult to contact or had moved away	Hopkins 2010 Lessard 2019 Reed 2015	*"It (a phone call) was the quickest and most convenient way at the time. As soon as I found out I wanted to let people know straightaway."* *""That feels spineless. If I did this to someone, I need to be the one to tell them."* *"I can do it straight away. As soon as I find out I can give them a call. I don't have to make arrangements to meet them somewhere and take time out of their day just so I can tell them something."*	Moderate confidence	Downgraded because of lack of agreement between participants and lack of adequacy

Summary of review finding	Studies contributing to the review finding	Illustrative quotes	CERQual assessment	Explanation of GRADE-CERQual assessment
Concerns about disclosing STI, relationship and sexuality status Participants were concerned that different methods of partner notification could lead to their STI status and sexuality being widely known. Participants did not agree on which method would protect their privacy the most. Some participants were concerned that patient notification could make them known as infected in their community whereas provider notification would allow them to retain anonymity. Others felt that provider referral could expose them because they lived in a small community. Some participants were concerned that emails, letters or SMS could be shown to others leading to exposure, shame and stigma. Some did not want their partner to know they had infected them if it exposed their infidelity.	Coleman 2007 Contesse 2019 Goyette 2016 Hershow 2019 Hopkins 2010	*"…it just seemed to me, when my doctor described me the option [provider referral services], it was the best way to do it because it was all done anonymously."* *"When the town is socially conservative and homophobic, there is a great chance in the health department that the workers would be uncompassionate and biased."* *"I think a negative with both SMS and email is that anyone could see it. I don't think it's private. I wouldn't risk anybody else seeing it or showing his mates and saying, "Look at what this chick sent me.""*	Low confidence	Downgraded because findings were variable and people's views on the topic are likely to change considerably from person to person for a given situation
Some methods can be intrusive Some participants felt that provider referral without any input from the index patient was intrusive and felt cold and uncaring. It also left some partners with unanswered questions and some felt powerless due to the invasion of privacy. Other participants felt that being notified showed the index patient was caring enough to take the infection seriously and try to prevent onward transmission.	Coleman 2007 Contesse 2019 Goyette 2016 Hershow 2019 Reed 2015	*"There was a sense of…intrusion, and of…I think this feeling of powerlessness…Someone is ringing you with this bit of news and they have power of you or something…and it's just…you are so aware of your vulnerability"* *"I have had that happen [been notified by partner services staff from the health department], and while it was somewhat impersonal, it was helpful and informative."*	Low confidence	Downgraded because participants views were different for the same or similar situations and more evidence is required to understand why these differences exist.
Stress relating to anticipated, but often unrealised, conflict, consequences and violence Participants were concerned about their partners' reactions to being notified and this created anxiety and stress when telling their partners, particularly due to uncertainty about how they would respond. For most,	Coleman 2007 Contesse 2019 Hopkins 2010 Tomnay 2017 Wood 2018	*"I was pretty much shaking to be honest. it was definitely the hardest conversation I've ever had to have in my life and I didn't know how he was going to react or what he was going to say."* *"I cannot tell them because I don't want them to come to my house and they know my place, I*	Moderate confidence	Downgraded because there was a lack of data on angry or violent reactions from partners, and disagreement around when

Summary of review finding	Studies contributing to the review finding	Illustrative quotes	CERQual assessment	Explanation of GRADE-CERQual assessment
this fear was unrealised and their partners reactions were not as bad as anticipated. Some participants noted their partners were grateful to be notified. For participants where there was fear of an abusive or violent reaction, provider referral was considered more appropriate to protect themselves.		*don't want them attacking me, like blackmailing me. I don't want this to happen, I don't want to hurt my family even more, that is my biggest concern."* *"I was a little bit worried that I didn't know them as well as I did and they might go off. Yeah, they were great. Everybody's been great actually."*		people feel comfortable using provider referral
Coaching to improve the patient referral experience Participants felt large amounts of embarrassment, stress and responsibility when notifying partners. Some felt that they could have done it better had they had counselling or preparation in how best to deliver bad news. Index patients were also aware that they would be the first person that could support the partner and wanted to be better prepared to do this. A small minority felt coaching was cold and unnecessary.	Cavalcante 2016 Coleman 2007 Contesse 2019 Goyette 2016 Tomnay 2017 Wood 2018	*"A lot of people don't know how to talk to people or what to say, especially about this subject. I think it would be better if you told people how to talk."* *"Oh definitely. Just having some ideas of how you're going to respond to questions or just to how they react—to reactions and stuff like that—I think that would be extremely helpful. Yeah."* *"I wouldn't want coaching. That makes it cold and impersonal. I would thank them [partner services staff] and decline. I prefer to do things my way so I know my point gets across."*	High confidence	No need to downgrade; high agreement in findings across different population groups across different studies.

3 Integration and discussion of the evidence

3.1 Mixed methods integration

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

The effectiveness evidence showed that simple partner notification was as effective as other partner notification methods, including enhanced PN and provider referral. This was largely supported by evidence from the qualitative synthesis which showed that participants found simple partner notification most acceptable and felt that other methods such as provider referral should only be used in specific circumstances where it would be particularly challenging for index patients to notify their sexual partners themselves.

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

Findings from the qualitative evidence showed that face to face simple patient referral was the preferred method for notifying sexual partners, particularly if they had an intimate or regular relationship with them. As this method was considered most acceptable, and many participants reported feeling a moral responsibility to personally notify their partners, it could be expected to be more effective than other partner notification methods as more people would opt for this approach. However, the effectiveness evidence showed that simple patient referral was as effective as several types of enhanced partner notification, including using postal testing kits, urine sampling kits, counselling, a telephone call with a pharmacist, and pamphlets. Nevertheless, the qualitative evidence also indicated that other methods were seen as acceptable in certain circumstances, including for casual partners, for partners who had moved away or were difficult to contact, when there were concerns relating to person's sexual orientation or STI status being exposed, or when there were fears of violence or conflict. This may explain why other methods of partner notification such as enhanced notification or provider referral were also found to be effective.

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

The qualitative evidence showed that participants overwhelmingly felt that sex partners should be notified of their possible exposure to an STI, and that while simple patient referral is generally the preferred method, any method that ensures that partners are notified is acceptable. This may explain why almost all of the effect estimates crossed the line of no effect, because no one method emerged as more effective than others. There were no specific subgroup differences identified in the quantitative evidence that related to a specific population also identified in the qualitative evidence.

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

The quantitative evidence included several types of enhanced partner notification, including the use of urine sampling kits, postal testing kits, and accelerated partner therapy via a telephone call or pharmacy. These methods of partner notification were not explored in the qualitative studies so there was no acceptability data on participant's experiences or views of using these methods.

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

The qualitative findings showed that participants often experienced stress and anxiety when notifying partners and were concerned about their reactions. In some cases, there were fears of conflict, consequences and violence, although it was noted that these fears were often unrealised. Participants also expressed a desire for support and coaching in how to notify their sexual partners and how to approach potentially difficult conversations. The effectiveness evidence did not consider the role of index patient's emotions or fears when notifying sexual partners and there was no evidence relating to the use of index patient coaching to support with partner notification conversations.

3.2 The committee's discussion and interpretation of the evidence

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

When discussing the evidence, the committee noted the importance of understanding the terminology and definitions of each of the different methods of partner notification (PN). This review and the studies included within it used the following definitions:

Patient Referral

A form of PN where the index patient accepts responsibility for informing partner(s) of the possibility of exposure to an STI and for referring them to the appropriate services. Patient referral can be Simple or Enhanced:

Simple patient referral includes spoken advice from health service personnel about the need for sexual partners to receive treatment. Contact slips or standard referral letters may be used. Seen as a minimum standard for a PN intervention.

Enhanced patient referral includes a group of strategies that supplement the spoken advice with the aim of improving patient referral success, such as educational material, videos viewed in waiting rooms, written disease-specific information for index patients to give to their partners, or sampling kits for index patients to give to their partners.

Provider Referral

A form of PN where the provider (sexual health service) takes responsibility for confidentially notifying partners of the possibility of their exposure to an STI without identifying the index patient.

Contract (or Conditional) Referral

A form of PN where the provider and the index patient agree that the index patient will notify the partner(s) within a specified time period. It is also agreed that the provider will complete the PN process for those partners not reached by the index patient within the agreed time period.

Accelerated Partner Therapy

PN strategies that reduce the time for partners to be treated by offering them access to treatment through a telephone consultation with a clinician or pharmacist to assess eligibility for treatment without requiring a face-to-face consultation.

3.2.1 The outcomes that matter most

For the quantitative review the primary outcomes of interest were STI re-infection in index patients, the number of sex partners traced, the number of sex partners contacted, the number of sex partners tested, the number of sex partners diagnosed with an STI, the number of sex partners treated, and the number of index patients who had unprotected sex at 4 weeks. The committee discussed these outcomes and agreed that all were important for this review except for the number of index patients who had unprotected sex at 4 weeks. The committee discussed that it would be possible for both the index patient and their partner to have been tested, diagnosed and treated within this period and therefore unprotected sex at 4 weeks may be safe for both partners. The committee also noted that the number of partners tested was a more important outcome than the number of partners treated because not all people exposed will develop an infection. Focusing on treatment rates of partners is therefore not always a useful indicator of successful PN because it may overlook those who are tested and do not require treatment.

For the qualitative review the primary outcomes of interest were the values, beliefs, preferences, acceptability, attitudes, experiences and views of the approaches to partner notification for both index patients and their sexual partner(s). Potential adverse effects of partner notification were also considered important. The committee noted that an understanding of the barriers and facilitators of effective partner notification are important and that these will arise from this review that considered acceptability factors.

3.2.2 The quality of the evidence

Quantitative Evidence

There were 8 RCTs included in this review. Overall the evidence showed that there were no differences in almost all outcomes of interest (number of sex partners traced, contacted, tested or diagnosed; number of index patients re-infected with an STI) between those using simple patient referral and those using other methods of partner notification. One study (Cameron 2009) showed that enhanced partner notification using postal testing kits was significantly more likely to diagnose a partner with an STI than with simple patient referral using contact slips, but the difference may not be meaningful. The committee agreed that there is limited evidence to demonstrate that enhanced partner notification beyond simple patient referral improves outcomes.

The committee discussed the differences in terminology used across the studies for the different partner notification methods, particularly relating to the differences between ‘enhanced’ and ‘simple’ patient referral, and the use of contact slips or referral letters. The importance of correctly and consistently categorising the types of PN used in each study was noted. Using their clinical experience, committee members agreed that in UK practice, simple patient referral may include the use of contact slips or standard referral letters, but not always. Enhanced patient referral was understood to go beyond the use of contact slips and included methods such as the provision of self-sampling kits or disease-specific information for index patients to give to their partners. It was noted that not all studies used terminology consistent with these definitions so in some cases the method of partner notification was categorised differently in this review to how it had been described in the paper (for example Kissinger 2005 and Kissinger 2006 referred to the intervention as booklet-enhanced partner referral but it was categorised as simple partner notification in this review because it consisted of simple patient referral using contact slips from a booklet).

The committee highlighted limitations in the evidence with respect to the type of partner notification methods considered, particularly relating to the lack of comparisons between patient referral and provider referral. It was noted that only one study (Schwebke, 2010) compared patient versus provider referral, with most of the remaining studies comparing enhanced patient referral with simple patient referral. This focus on the effectiveness of enhancements to patient referral rather than comparisons of patient referral and provider

referral made it difficult for the committee to draw conclusions about the comparative effectiveness of these different partner notification methods. The study comparing patient and provider referral showed no difference in re-infection of index patients (Schwebke 2010). The committee drew on their clinical experience, particularly with respect to involvement in the National Chlamydia Screening Program (NCSP), where the support of specialist sexual health practitioners in tracing and notifying partners was recognised as being very important, particularly for young people.

The committee noted that the evidence included in this review was limited in terms of population, relying mainly on samples of women with chlamydia or trichomonas vaginalis (5 studies). There were no studies of people with HIV. The committee also discussed how the type of STI, whether it was bacterial or viral, and whether it can be asymptomatic in partners, may be important factors to consider when assessing the impact of different PN interventions. The committee agreed that although studies of a broader range of STIs would have been desirable, the included evidence was still directly applicable because it nevertheless covered STIs of interest, so downgrading for directness was not required.

The committee discussed the appropriateness of using self-reported partner notification by index patients, which may be impacted by social desirability factors and be less reliable than verified measures. The committee noted their preference for verified indicators of partners being notified rather than the self-report of index patients. In the 3 studies reporting outcomes for number of partners contacted, one study (Estcourt, 2015) used partner verified outcomes and the other 2 studies (Cameron 2009 and Wilson 2009) used index patient self-report. The committee concluded that whilst the self-reported outcomes were less preferable, findings from the studies were consistent and showed no difference in the number of partners contacted.

The committee noted that some of the results in this review were unexpected, particularly those that failed to show that enhancing patient delivered partner notification with additional methods such as urine testing kits, counselling, or accelerated partner therapy were effective. The committee pointed out that some of these additional interventions have a resource cost associated with their use, so without clear evidence of additional benefit, it would be difficult to make recommendations about their use in circumstances where patient led partner notification was most appropriate.

Taking account of all the above considerations, the committee discussed and agreed that while there were some limitations to the evidence, there was still evidence of the effectiveness of simple patient referral and that this needed to be reflected in the recommendations. They noted the absence of quantitative evidence for the effectiveness of provider referral but drew on their clinical experience to recognise the importance of this option being available to people who were otherwise unable or unwilling to notify partners themselves.

Qualitative Evidence

The committee agreed that qualitative evidence on the acceptability of different PN methods was important. The committee acknowledged that the evidence was relevant to the population, informative, from a range of good quality studies, and there were minimal concerns about risk of bias. They noted that the themes were well supported across studies and that the studies were more diverse in terms of study populations and STI type than the quantitative evidence. These differing study populations for the quantitative and qualitative reviews precluded a mixed methods analysis but the committee noted specific points of overlap between the two review findings. As with the quantitative evidence, the committee wished to explore whether the type of STI, whether it was bacterial or viral, and whether it can be asymptomatic in partners, impacted the acceptability of PN methods, but understood that it was not possible to do this with the available evidence. Nevertheless, it was acknowledged there was a good degree of consistency in themes across studies, suggesting that the findings did not differ significantly by STI type. The committee also highlighted that

the acceptability of PN methods may be impacted by whether the index patient was the source of the infection or had been infected by a partner, but again noted that this information was not available from the studies included in this review.

The committee agreed that the qualitative evidence showed a consistent preference for simple patient referral and acknowledged the alignment with findings from the quantitative review that showed limited additional benefit of enhancements to simple patient referral. The committee discussed that while the acceptability of patient led approaches was apparent, the qualitative evidence also highlighted that other approaches were important in circumstances where patient referral was not acceptable. The committee discussed that these circumstances might include when the index patient was struggling to deal with their own diagnosis, when PN risked exposing a patients' undisclosed sexuality, or when there were concerns about negative partner reactions and index patient safety. Combining this with their clinical expertise, they emphasised the importance of offering patients a choice of PN method and the role of specialist services that can offer enhanced support with PN for those that require it. While noting the importance of partner notification the committee acknowledged that on occasion this choice may include choosing not to notify their sex partners.

The committee recognised the strength of evidence that coaching people on how to carry out PN is important and discussed the need for a specific recommendation about this. The committee considered that while the term 'coaching' was used in the studies, this terminology implied a formal process that may require clinician training and therefore preferred to focus on offering support to patients that was more informal and conversational in style.

The committee discussed the complexity of PN for people who may have casual or anonymous sexual partners and the difficulty of notifying partners where contact details were very limited or unavailable. They acknowledged the potential role of apps or other digital methodologies for this and considered the qualitative evidence from two included studies (Contesse, 2019 and Lessard, 2019) that explored the acceptability of using Geosocial Networking (GSN) apps to assist with patient referral. The committee agreed that despite the limited evidence, GSN apps are becoming an increasingly common way of meeting sex partners and a recommendation about the potential use of apps to overcome some of the barriers to PN for people seeking anonymous sex was warranted.

3.2.3 Benefits and harms

The committee acknowledged that any type of PN is beneficial because notifying partners is one of the most important ways of preventing re-infection and reducing the transmission of STIs, as well as ensuring partners are tested and, if necessary, treated. The committee noted the importance of discussing these benefits of PN with patients newly diagnosed with an STI, in terms of benefits to both the index patient and their sexual partner(s). The committee recognised that, based on the evidence included in both the quantitative and qualitative reviews, patient led referral may be particularly beneficial for both index patients and their partner(s), but the committee also recognised the benefits of other methods of PN, such as provider referral, in certain contexts. The committee noted the importance of offering patients a choice of PN methods and that providing information about the methods available to them may support their decision making.

The committee agreed that potential harms of PN would be negative responses from partners, including the potential for violence, but noted that the qualitative evidence suggested fears of violent responses were often unwarranted. Nevertheless, the committee recognised that although experiences of violence or compromised patient safety were not reported in any of the included qualitative studies, they remain a potentially adverse consequence of PN that should be considered. The committee therefore discussed the need to make recommendations about patient safety, patient choice, and to acknowledge that there may be situations where PN is not appropriate. The committee also noted that their

clinical responsibility was to the index patient and not their sex partners, although simultaneously acknowledged that the needs and preferences of partners being notified remain important.

The committee also considered potential harms of PN relating to the unintended disclosure of relationship, sexuality or STI status. The committee recognised the importance of anonymity and confidentiality for all PN methods but did not consider it necessary to make specific recommendations about patient confidentiality as this is assumed to be standard practice for all healthcare professionals. However, the committee agreed that when informing patients about the different PN methods available to them, the option to maintain anonymity should be highlighted. It was noted that provider referral may be the most appropriate method when the patient expresses a desire to remain anonymous.

3.3.4 Cost effectiveness and resource use

The committee discussed the results of the cost-effectiveness study on partner notification for people with a new diagnosis of HIV, conducted in the Netherlands. They agreed it was a robust study, and provided good evidence this more intensive method of partner notification would be cost-effective for people with HIV. However, they noted that HIV is very different to other STIs (both in terms of its health consequences and the public perception of it) and therefore were not confident this evidence could be generalised to the broader question of partner notification for all STIs.

For the recommendations made, the committee were confident there should not be a substantial resource impact. Partner notification should already be happening for people diagnosed with STIs and the recommendations made around how to undertake it should not increase the complexity of the process. The lack of evidence around the most effective methods of partner notification means the recommendations made are relatively general, and therefore do not impose particular burdens on the services undertaking it. They noted that some people may need additional support to undertake effective partner notification, but the increase in the number of partners identified and appropriately tested and treated means this should be a worthwhile use of healthcare professional time.

3.3 Recommendations supported by this evidence review

This evidence review supports recommendations 1.3.1 to 1.3.7.

3.4 References – included studies

3.4.1 Effectiveness

Apoola, A and Beardsley, J (2009) Does the addition of a urine testing kit to use of contact slips increase the partner notification rates for genital chlamydial infection?. International journal of STD & AIDS 20(11): 775-7

Cameron, ST, Glasier A, Scott G, Young H, Melvin L, Johnstone A, Elton R (2009) Novel interventions to reduce re-infection in women with chlamydia: a randomized controlled trial. Human reproduction (Oxford, England) 24(4): 888-95

Estcourt CS, Sutcliffe LJ, Copas A, Mercer CH, Roberts TE, Jackson LJ, Symonds M, Tickle L, Muniina P, Rait G, Johnson AM, Aderogba K, Creighton S, Cassell JA (2015) Developing and testing accelerated partner therapy for partner notification for people with genital Chlamydia trachomatis diagnosed in primary care: a pilot randomised controlled trial. Sexually transmitted infections 91(8): 548-54

Kissinger P, Mohammed H, Richardson-Alston G, Leichliter JS, Taylor SN, Martin DH, Farley TA (2005). Patient-delivered partner treatment for male urethritis: a randomized, controlled trial. Clinical infectious diseases 41(5): 623-9

Kissinger P, Schmidt N, Mohammed H, Leichliter JS, Gift TL, Meadors B, Sanders C, Farley TA (2006) Patient-delivered partner treatment for Trichomonas vaginalis infection: a randomized controlled trial. Sexually transmitted diseases 33(7): 445-450

Schwebke JR and Desmond RA (2010) A randomized controlled trial of partner notification methods for prevention of trichomoniasis in women. Sexually transmitted diseases 37(6): 392-6

Tomnay JE, Pitts MK, Kuo TC Fairley CK. (2006) Does the Internet assist clients to carry out contact tracing? A randomized controlled trial using web-based information. International journal of STD & AIDS 17(6): 391-4

Wilson TE, Hogben M, Malka ES, Liddon N, McCormack W, Rubin S, Augenbraun MA (2009) A randomized controlled trial for reducing risks for sexually transmitted infections through enhanced patient-based partner notification. American journal of public health 99suppl1: 104-10

3.4.2 Qualitative

Cavalcante EGF, Miranda MCC, de Carvalho AZFHT, de Lima ICV, Glavao MTG. (2016) Partner notification for sexually transmitted infections and perception of notified partners. Revista da Escola de Enfermagem da U S P 50(3): 450-7

Coleman C, and Lohan M. (2007) Sexually acquired infections: do lay experiences of partner notification challenge practice?. Journal of advanced nursing 58(1): 35-43

Contesse MG, Fredericksen RJ, Wohlfeiler D, Hecht J, Kachur R, Strona F, Katz DA. (2019) Attitudes About the Use of Geosocial Networking Applications for HIV/STD Partner Notification: A Qualitative Study. AIDS education and prevention: official publication of the International Society for AIDS Education 31(3): 273-285

Goyette M, Wamuti BM, Owuor M, Bukusi D, Maingi PM, Otieno FA, Cherutich P, Ng'ang'a A, Farquhar C. (2016) Understanding Barriers to Scaling Up HIV-Assisted Partner Services in Kenya. AIDS patient care and STDs 30(11): 506-511

Hershow RB, Zimba CC, Mweemba O, Chibwe KF, Phanga T, Dunda W, Matenga T, Mutale W, Chi BH, Rosenberg NE, Maman S. (2019) Perspectives on HIV partner notification, partner HIV self-testing and partner home-based HIV testing by pregnant and postpartum women in antenatal settings: a qualitative analysis in Malawi and Zambia. Journal of the International AIDS Society 22(s3): e25293

Hopkins CA, Temple-Smith MJ, Fairley CK, Pavlin NL, Tomnay JE, Parker RM, Bowden FJ, Russel DB, Hocking JS, Chen MY. (2010) Telling partners about chlamydia: how acceptable are the new technologies?. BMC infectious diseases 10: 58

Lessard D, Aslan A, Zeggagh J, Morel S, Michels D, Lebouche B. (2019) Acceptability of a digital patient notification and linkage-to-care tool for French PrEPers (WeFLASH©): Key stakeholders' perspectives. International Journal of STD and AIDS 30(14): 1397-1407

Reed JL, Huppert JS, Gillespie GL, Taylor RG, Holland CK, Alessandrini EA, Kahn JA. (2015) Adolescent patient preferences surrounding partner notification and treatment for sexually transmitted infections. Academic emergency medicine: official journal of the Society for Academic Emergency Medicine 22(1): 61-6

Tomnay JE, Hulme-Chambers A, Bilardi J, Fairley CK, Huffam S, Chen MY. (2017) A Qualitative Study of Means to Improve Partner Notification After an HIV Diagnosis Among Men Who Have Sex with Men in Australia. AIDS patient care and STDs 31(6): 269-274

Wood JM, Harries J, Kalichman M, Kalichman S, Nkoko K, Mathews C. (2018) Exploring motivation to notify and barriers to partner notification of sexually transmitted infections in South Africa: a qualitative study. BMC public health 18(1): 980

3.4.3 Economic

Nichols BE, Götz HM, van Gorp ECM, Verbon A, Rokx C, Boucher CAB, et al. (2015) Partner Notification for Reduction of HIV-1 Transmission and Related Costs among Men Who Have Sex with Men: A Mathematical Modeling Study. PLoS ONE 10(11): e0142576

Appendices

Appendix A – Review protocols

Review protocol for effectiveness of partner notification methods

ID	Field	Content
1.	Review title	Effective and cost-effective partner notification methods to prevent or reduce STIs
2.	Review question	What partner notification methods for STIs are effective and cost effective?
3.	Objective	Partner notification (PN) is a process whereby partners of patients diagnosed with an STI are contacted and informed of their potential exposure to infection and provided with access to advice, testing and, if appropriate, treatment. PN can reduce STIs by controlling the spread of STIs, reducing re-infection rates, and reaching people with asymptomatic STIs. There are different approaches to partner notification and a lack of consensus about the most effective methods is a reason for the diversity of practice. This presents a challenge to improving partner notification efforts. The aim of this review is to establish which PN methods are effective and cost-effective for reducing STIs.
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

ID	Field	Content
		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 Key websites will be searched for relevant reports or publications (British HIV Association, CDC, PHE, Google) 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 2004 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. – The Information Services team at NICE will quality assure the principal search strategy and peer review the strategies for the other databases according to the standard NICE checklist that was adapted from the 2015 Peer review of electronic search strategies (PRESS) checklist.

ID	Field	Content
5.	Condition or domain being studied	Sexually transmitted infections including genital herpes, chlamydia, genital warts, gonorrhoea, syphilis, lymphogranuloma venereum (LGV), *Trichomonas vaginalis*, human immunodeficiency virus (HIV), *Mycoplasma genitalium*
6.	Population	People from age 16 and over that have been recently diagnosed with an STI (index patients), and/or their sexual partners.

7.	Intervention/ Exposure/ Test	Partner notification or contact tracing methods, including
		
		• Provider referral
		• Patient referral
		  ○ Simple patient referral
		  ○ Enhanced patient referral
		• Contract (or conditional) referral
		• Accelerated partner therapy
		• Electronic partner notification (ePN)

8.	Comparator/ Reference standard/ Confounding factors	Other partner notification intervention Additional counselling No partner notification
9.	Types of study to be included	**Included study designs:** • RCTs • Systematic reviews of RCTs **Excluded study designs:** • Non-randomised controlled trial • Cohort • Case control studies • Correlational studies or cross-sectional designs

ID	Field	Content
10.	Other exclusion criteria	Patient-delivered partner therapy (PDPT) or Expedited partner therapy (not currently legal in the UK) Only studies from the Organisation for Economic Cooperation and Development (OECD) countries 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 2017 and 2018. 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 such as partner notification methods to help prevent or reduce STIs.
12.	Primary outcomes (critical outcomes)	• STI re-infection • Number of partners / sexual contacts: - Identified - Notified - attended (verified by healthcare professional or if contacts reported attendance) - tested - diagnosed - treated - untraceable
13.	Secondary outcomes (important outcomes)	• Condom use • Quality of life
14.	Data extraction	As this review includes a specific population and vaccines, it is anticipated that this will not produce a large search hit rate. Priority screening will not be used in this review, but the entire database will be screened.

ID	Field	Content
	(extraction and coding)	Where technical capacity allows, 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). 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.	Risk of bias (quality) assessment	Risk of bias for individual studies will be assessed using the appropriate checklist as described in Developing NICE guidelines: the manual
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 may 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.

ID	Field	Content
		Continuous outcomes not reported on the same scale will be pooled using a standardised mean difference in a standard pair-wise meta-analysis. If a network which includes two or more treatments can be constructed and the interventions can be discretely categorised into the included referral interventions, a network meta-analysis will be conducted for the outcome STI re-infection in index patients. 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: • Men who have sex with men • Young people age 16 to 24 years • People from a Black African or Caribbean family background • Trans and non-binary people • Older adults • People with low socioeconomic status • People with learning disabilities • Migrant communities • Those taking HIV PrEP Where evidence allows, sub-group analyses may be used to answer questions about the effectiveness of intervention types, including: • Digitally delivered methods • Type of STI
18.	Type and method of review	Intervention
19.	Language	English

ID	Field	Content
20.	Country	England
21.	Anticipated or actual start date	January 2020
22.	Anticipated completion date	September 2021
25.	Review team members	A multidisciplinary committee including the Public Health England Topic Advisor (PHETA) will be involved in developing the evidence review. NICE Public Health guideline development technical guideline team: • Technical lead: Robby Richey • Technical analyst: Jonathan Nyong • [Health economist] • Information specialist: Daniel Tuvey • Project Manager: Adam O'Keefe
26.	Funding sources/sponsor	This systematic review is being completed by the Public Health guideline development, 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	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: [NICE guideline webpage].

ID	Field	Content
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	Partner notification, patient referral, provider referral, contract referral, contact tracing, expedited partner therapy, sexually transmitted infections, STIs

Review protocol for acceptability of partner notification methods

ID	Field	Content
1.	Review title	Acceptability of partner notification methods for STIs.
2.	Review question	What is the acceptability of partner notification methods for STIs?
3.	Objective	Partner notification (PN) is a process whereby partners of patients diagnosed with an STI are contacted and informed of their potential exposure to infection and provided with access to advice, testing and, if appropriate, treatment. PN can reduce STIs by controlling the spread of STIs, reducing re-infection rates, and reaching people with asymptomatic STIs. There are different approaches to partner notification and a lack of consensus about the most effective methods is a reason for the diversity of practice. This presents a challenge to improving partner notification efforts. The aim of this review is to establish which PN methods are effective and cost-effective for reducing STIs.
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)

ID	Field	Content
		• 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 Key websites will be searched for relevant reports or publications (British HIV Association, CDC, PHE, Google) 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 2004 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.

ID	Field	Content
		The Information Services team at NICE will quality assure the principal search strategy and peer review the strategies for the other databases according to the standard NICE checklist that was adapted from the 2015 Peer review of electronic search strategies (PRESS) checklist.
5.	Condition or domain being studied	Sexually transmitted infections including genital herpes, chlamydia, genital warts, gonorrhoea, syphilis, lymphogranuloma venereum (LGV), *Trichomonas vaginalis*, human immunodeficiency virus (HIV), *Mycoplasma genitalium*
6.	Population	People from age 16 and over that have been recently diagnosed with an STI (index patients), and/or their sexual partners.
7.	Intervention/Exposure/Test	Acceptability factors that may impact on partner notification methods. These may include interventions or strategies identified in RQ3.1 but is not restricted to these.
8.	Comparator/Reference standard/Confounding factors	Not applicable
9.	Types of study to be included	Inclusion: Qualitative studies Mixed methods studies with relevant qualitative data. There will be no country restriction on this search.
10.	Other exclusion criteria	Only papers published in the English language will be included Only full published peer-reviewed qualitative studies 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

ID	Field	Content
		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 2017 and 2018. 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 such as partner notification methods to help prevent or reduce STIs.
12.	Primary outcomes (critical outcomes)	The values, beliefs, preferences, acceptability, attitudes, experiences and views of the approaches to partner notification. The acceptability of partner notification on index patients and their sexual partner(s). Any adverse effects of partner notification.
13.	Secondary outcomes (important outcomes)	Not applicable
14.	Data extraction (extraction and coding)	As this review includes a specific population and vaccines, it is anticipated that this will not produce a large search hit rate. Priority screening will not be used in this review, but the entire database will be screened. A standardised template will be used to extract data from studies (this is consistent with the Developing NICE guidelines: the manual section 6.4). 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.	Risk of bias (quality) assessment	Risk of bias for individual studies 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.

ID	Field	Content
16.	Strategy for data synthesis	The key findings from the qualitative studies will be combined using a thematic analysis. Supporting quotations and summaries of data will be included. GRADE CERQual will be used to assess the confidence we have in the summary findings of each of the themes. 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. The 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 within the technical team to ensure agreement across the themes. A mixed methods synthesis including studies from question 3.1. 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. The results may be presented as a narrative summary or 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 analysis will be conducted to include: • Men who have sex with men • Young people age 16 to 24 years • People from a Black African or Caribbean family background • Trans and non-binary people • Older adults • People with low socioeconomic status • People with learning disabilities

ID	Field	Content
		• Migrant communities • Those taking HIV PrEP
18.	Type and method of review	Qualitative
19.	Language	English
20.	Country	England
21.	Anticipated or actual start date	January 2020
22.	Anticipated completion date	September 2021
25.	Review team members	A multidisciplinary committee including the Public Health England Topic Advisor (PHETA) will be involved in developing the evidence review. NICE Public Health guideline development technical guideline team: • Technical lead: Robby Richey • Technical analyst: Jonathan Nyong • Health economist: Joshua Pink • Information specialist: Daniel Tuvey • Project Manager: Adam O'Keefe
26.	Funding sources/sponsor	This systematic review is being completed by the Public Health guideline development, 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

ID	Field	Content
		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	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: [NICE guideline webpage].
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	Partner notification, patient referral, provider referral, contract referral, contact tracing, expedited partner therapy, sexually transmitted infections, STIs

Appendix B – Literature search strategies

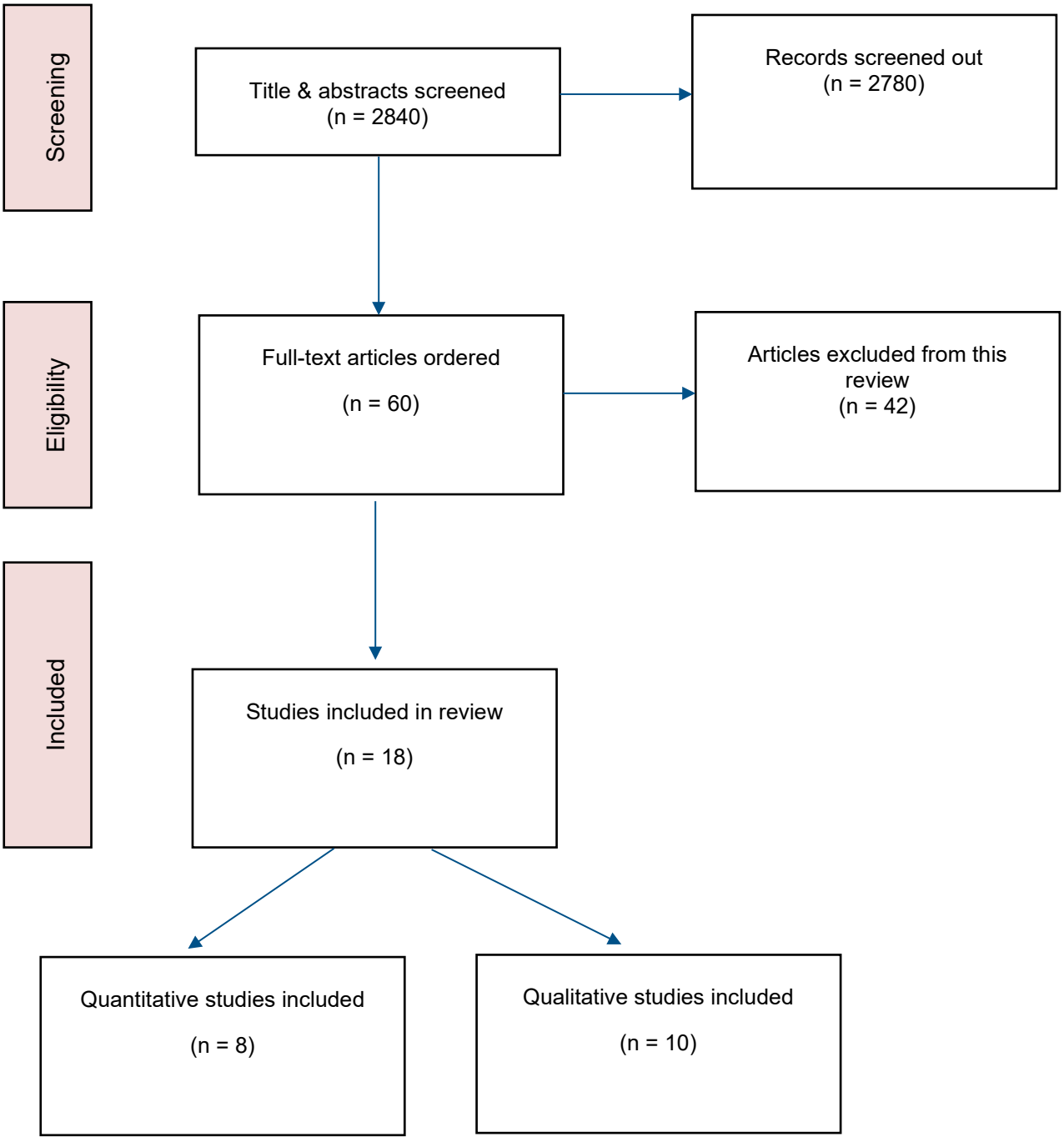
Database name: MEDLINE

Database: Ovid MEDLINE(R) 1996 to January 28, 2020

1	Herpes Genitalis/ or Herpes Simplex/	13067
2	((genital* or simplex*) adj3 herpes*).ti,ab.	30402
3	chlamydia*.ti,ab.	20940
4	Chlamydia Infections/ or Chlamydia/ or Chlamydia trachomatis/	15700
5	((genital* or anogenital* or ano-genital* or venereal*) adj3 wart*).ti,ab.	2480
6	Condylomata Acuminata/	3591
7	"condylomata acuminata".ti,ab.	619
8	Papillomavirus Infections/	24413
9	(papillomavirus adj (human* or infect*)).ti,ab.	3314
10	hpv.ti,ab.	32801
11	Gonorrhea/	7722
12	(Gonorrhea* or Gonorrhoea*).ti,ab.	11965
13	Syphilis/	9070
14	syphilis*.ti,ab.	12167
15	(lymphogranuloma venereum or lgv).ti,ab.	812
16	Lymphogranuloma Venereum/	797
17	Trichomonas vaginalis/	2506
18	(trichomonas vaginali* or Trichomoniasi*).ti,ab.	4207
19	Trichomonas Infections/	1323
20	HIV Infections/ or HIV/	181983
21	(hiv or human Immunodeficiency Virus*).ti,ab.	262765
22	(mycoplasma genitalium or Mgen).ti,ab.	1104

23	Mycoplasma genitalium/	689
24	Sexually Transmitted Diseases/	17420
25	((sexually adj2 transmit* adj2 (disease* or infection*)) or sti or std).ti,ab.	29785
26	(venereal* adj2 (disease* or infection*)).ti,ab.	1617
27	or/1-26	406905
28	((contact* or contract* or partner*) adj2 (trac* or notif* or manage*)).ti,ab.	4648
29	Contact Tracing/	3788
30	((provider* or patient* or contact* or contract* or conditional*) adj2 refer*).ti,ab.	38802
31	(accelerated partner adj (therap* or treat*)).ti,ab.	12
32	(expedited partner adj (therap* or treat*)).ti,ab.	90
33	(enotif* or e-notif*).ti,ab.	9
34	or/28-33	45930
35	27 and 34	3065
36	limit 35 to english language	2881
37	limit 36 to (letter or historical article or comment or editorial or news or case reports)	336
38	36 not 37	2545
39	Animals/ not (Humans/ and Animals/)	3576922
40	38 not 39	2544
41	limit 40 to yr="2004 -Current"	1643

Appendix C – Effectiveness and qualitative evidence study selection



Appendix D – Effectiveness and qualitative evidence

D.1 Quantitative public health evidence

Apoola, 2009

Bibliographic Reference	Apoola, A; Beardsley, J; Does the addition of a urine testing kit to use of contact slips increase the partner notification rates for genital chlamydial infection?; International journal of STD & AIDS; 2009; vol. 20 (no. 11); 775-7

Study details

Trial registration number	ISRCTN12617257
Aim	This study assessed if providing at home urine testing kits to male sex partners via female index patients would increase testing rates compared with contact slips inviting sex partners to clinic.
Country/geographical location	UK
Setting	Sexual health clinic.
Inclusion criteria	Diagnosis of chlamydia infection.
Exclusion criteria	Not reported.
Method of randomisation	Block randomisation based on random numbers.
Method of allocation concealment	Sealed opaque numbered envelopes opened sequentially.

Unit of analysis	Number of partners identified, number of traceable partners, number of partners treated, number of partners treated within 28 days.
Statistical method(s) used to analyse the data	Results were presented as median and interquartile range because they were skewed. Mann-Whitney U and chi-squared tests for comparison or association between groups was done. Power calculations: data from the study site showed that 30% of index patients had at least 1 partner treated. To show an increase of 20% with a power of 0.8 and an alpha of 0.5, the researchers needed to recruit 186. They recruited 200 to account for drop-outs.
Attrition	Not reported.
Study limitations	Urine kit was not postable so men had to bring the sample into clinic.
Funding	No external funding

TIDierR Checklist

Study details

Brief name	n/a
Rationale/theory/Goal	Men who are provided with a urine testing kit would be more likely to use that than to go into clinic to get a swab test.
Method of delivery	Patient delivered.
Setting/location of intervention	1 sexual health clinic
Intensity/duration of the intervention	However long it takes to deliver the slip and get to the clinic.
Tailoring/adaptation	None.
Unforeseen modifications	Not reported, unlikely.

Planned treatment fidelity	Not reported.
Actual treatment fidelity	Not reported.

Study arms

Swab testing (N = 100)

Materials used	Patient referral slips
Procedures used	Index patients were seen by a health adviser and details of partners taken down. Contact slips coded with the diagnosis were given to the index patients to give to partners. The slips invite the partners to clinic for a swab test for STI.

Urine testing (N = 100)

Materials used	Patient referral slip. Urine testing kit.
Procedures used	As the swab testing arm but index patients were also given a urine testing kit to give to partners. Partners would hand a urine sample to the clinic in person.

Characteristics

Study-level characteristics

	Study (N = 200)
Gender (women)	n = 200 ; % = 100

Arm-level characteristics

	Swab testing (N = 100)	Urine testing (N = 100)
Age (medianIQR)	20 (18 to 23)	22 (19 to 25)
Ethnicity (white)	n = 91 ; % = 91	n = 89 ; % = 89
History of STIs	n = 73; % = 73	n = 77; % = 77

Outcomes

Study timepoints	Baseline

Outcomes for partners of index patients

	Swab testing	Urine testing
	Baseline	**Baseline**
	N = 100	N = 100
Number of partners identified per index patient (MedianIQR) *Polarity: Higher values are better*	1 (1 to 1)	1 (1 to 1)
1 partner	n = 83 ; % = 83	n = 83 ; % = 83
2 partners	n = 14 ; % = 14	n = 12 ; % = 12
3 or more partners	n = 3 ; % = 3	n = 5 ; % = 5
Number of traceable partners *Polarity: Higher values are better*	119	114
1 partner	n = 91 ; % = 91	n = 88 ; % = 88

	Swab testing	Urine testing
	Baseline	**Baseline**
	N = 100	N = 100
2 partners	n = 8 ; % = 8	n = 10 ; % = 10
3 or more partners	n = 1 ; % = 1	n = 2 ; % = 2
Number of partners treated in clinic *Polarity: Higher values are better*	67	62
0 partners	n = 36 ; % = 36	n = 40 ; % = 40
1 partner	n = 61 ; % = 61	n = 58 ; % = 58
2 partners	n = 3 ; % = 3	n = 2 ; % = 2

Section	**Risk of bias**	**Reason**
Domain 1: Bias arising from the randomisation process	Low	No reason to suspect problem with randomisation process. Difference in age between groups but not a large concern as the age range for the cohort was small
Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention)	Low	It was not possible to blind people delivering interventions but there were no deviations from the intended intervention because of the experimental context. Intention to treat analyses used.
Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention)	Low	Co-interventions were balanced across intervention groups and interventions were delivered immediately so implementation failure unlikely.

Section	Risk of bias	Reason
Domain 3. Bias due to missing outcome data	Low	Outcome available for nearly all participants
Domain 4. Bias in measurement of the outcome	Low	Method of measuring outcome appropriate and did not differ between groups. Outcome assessors were not aware of allocation.
Domain 5. Bias in selection of the reported result	Low	Trial registered and outcomes in protocol reported
Overall bias and Directness	Risk of bias judgement	Low
	Overall Directness	Directly applicable

Cameron, 2009

Bibliographic Reference	Cameron, S T; Glasier, A; Scott, G; Young, H; Melvin, L; Johnstone, A; Elton, R; Novel interventions to reduce re-infection in women with chlamydia: a randomized controlled trial.; Human reproduction (Oxford, England); 2009; vol. 24 (no. 4); 888-95

Study details

Trial registration number	Not reported.
Study start date	May-2004
Study end date	Dec-2006
Aim	This was a 3-arm trial, but one of the arms is not relevant for the review so has not been extracted (PDPT arm). The primary aim of this study was to determine whether postal testing kit (PTK) and patient-delivered partner therapy (PDPT; azithromycin) reduced re- infection rates in women with uncomplicated C. trachomatis (chlamydia) infection over 12 months compared with patient referral. It also looked to determine the proportion of partners tested/treated with each intervention (secondary outcome).

Country/geographical location	UK
Setting	All family planning clinics (FPC), GUM clinics and hospital termination of pregnancy services in Edinburgh.
Inclusion criteria	At least 1 sexual partner who had not been treated. Planning to reside locally (Edinburgh and Lothian) for 12 months. Written informed consent. Female, 16-45yrs, tested positive for C.trachomatis
Exclusion criteria	Allergy to azithromycin. Significant medical illnesses.
Method of randomisation	Computer generated randomization numbers in blocks, stratified for each recruitment site.
Method of allocation concealment	Seal opaque envelopes
Unit of analysis	**Primary outcome:** Reinfection over 12 months. **Secondary outcomes:** Proportion of partners tested or treated.
Statistical method(s) used to analyse the data	Assuming a reinfection rate of 30% in the patient referral (PR) group and 10% in the PTK and PDPT groups, 52 women in each group would give 90% power at 5% level of significance. 110 women were recruited to ensure power with 50% drop out rate. Baseline characteristics were compared between groups using t-tests, Kruskal–Wallis or chi squared tests. Chi squared was also used to compare the number of partners in each group tested or treated. Cox proportional hazards regression was used to compare rates of reinfection in women by using the time to first positive result and taking into account the different numbers of tests returned by censoring last follow-up time. In addition, in order to take account of the number of repeat tests performed in women in each group, comparison of rates of re-infection was also made by chi squared tests with adjustment for numbers of tests, by including the latter as a covariate in multiple logistic regressions.
Attrition	PN group: 46 (41%) lost at 3 months; 57 (52%) lost at 6 months; 65 (59%) lost at 9 months; 62 (56%) lost at 12 months. PTK group: 38 (35%) lost at 3 months; 48 (44%) lost at 6 months; 53 (48%) lost at 9 months; 50 (45%) lost at 12 months.

Funding	The study was funded from a grant from the Chief Scientist Office, Scottish Executive Health Department.

Characteristics

Study-level characteristics

	Study (N = 220)
Gender female	n = 220 ; % = 100

Arm-level characteristics

	Patient referral (N = 110)	**Postal testing kit (N = 110)**
Age, mean (SD)	22.4 (4.2)	21.9 (4.2)
Ethnicity, non-Caucasian race	n = 3 ; % = 2	n = 4 ; % = 4
>1 male partner past 6 months, mean (SD)	44 (40)	35 (32)
New male partner past 6 months, mean (SD)	66 (60)	68 (62)
Concurrent male partner past 6 months, mean (SD)	3 (3)	3 (3)

TIDieR Checklist

Study details

Procedures used	All subjects received written and verbal information about chlamydia and the importance of partner treatment. Women agreed to submit a urine sample at 3 monthly intervals over 1 months for repeat testing for chlamydia using the COBAS Amplicor CT test (Roche Diagnostics, Basel). As there is only one chlamydia testing laboratory in Lothian, it was possible to track whether patients and their partners were tested/diagnosed even if they lost contact with the study.

Study arms

Patient referral (N = 110)	
Brief name	n/a
Procedures used	Details of sexual contacts within the past 6 months were recorded. Women agreed to contact partners themselves and were provided with standard contact slips to encourage partner notification. They were also provided with information on chlamydia and local GUM clinics that they could pass onto partners. Subjects were contacted up to 3 times by phone 4 weeks after study entry to check if women had contacted partners. All subjects received written and verbal information about chlamydia and the importance of partner treatment. Women agreed to submit a urine sample at 3 monthly intervals over 1 months for repeat testing for chlamydia using the COBAS Amplicor CT test (Roche Diagnostics, Basel). As there is only one chlamydia testing laboratory in Lothian, it was possible to track whether patients and their partners were tested/diagnosed even if they lost contact with the study.
Setting/location of intervention	Clinic.
Intensity/duration of the intervention	Information given by nurse or doctor would last the length of a consultation; follow-up was 12 months.
Tailoring/adaptation	None.
Unforeseen modifications	Not reported; not likely.
Planned treatment fidelity	50% drop out rate anticipated.
Actual treatment fidelity	See attrition.
Postal testing kit (N = 110)	
Brief name	n/a
Rationale/theory/Goal	Providing people with an easy way to test themselves will prevent the delay in getting treatment or getting tested in the first place. Many people with an STI continue to have sex without a condom increasing the risk of re-infecting a treated partner.
Procedures used	Details of sexual contacts were recorded as the PR group. They were given PTKs to deliver to their partners. The test involved providing a sample of urine to the testing laboratory. It included a form to complete with details of how a partner wished to be

	contacted, an instruction leaflet, a postage paid pre-addressed envelope into which the sample and form would be placed and sent direct to the laboratory. The kit also included a leaflet about chlamydia, information about the study with contact details of the study nurse, GUM clinics. For those men who subsequently tested positive, the study nurse arranged treatment at GUM. All subjects received written and verbal information about chlamydia and the importance of partner treatment. Women agreed to submit a urine sample at 3 monthly intervals over 1 months for repeat testing for chlamydia using the COBAS Amplicor CT test (Roche Diagnostics, Basel). As there is only one chlamydia testing laboratory in Lothian, it was possible to track whether patients and their partners were tested/diagnosed even if they lost contact with the study.
Method of delivery	Clinic and post.
Setting/location of intervention	Clinic.
Intensity/duration of the intervention	The time taken to attend clinic and send the kits. For the partners, it is the time taken to provide a sample to send to the laboratory and to get treated. Follow-up is 12 months.
Tailoring/adaptation	None.
Unforeseen modifications	Not reported, unlikely.
Planned treatment fidelity	50% drop out rate anticipated.
Actual treatment fidelity	See attrition.

Outcomes

Study timepoints	12 (month)

Partner testing/treatment rates

N= are for number of male partners, not women in the study.

	Patient referral	Postal testing kit
	12 (month)	**12 (month)**
	N = 134	N = 124
Number of men tested *Polarity: Higher values are better*	n = 46 ; % = 34	n = 51 ; % = 41
Number of men diagnosed with chlamydia of those tested *Polarity: Lower values are better*	n = 20 ; % = 15 (of n=134) % = 43 (of n=46)	n = 31 ; % = 28 (of n=124) % = 61 (of n=51)

Index patient reported partner contacts rates

N= number of women who responded to these questions; n= number of women who contacted partners; % is calculated by number of women who responded not total number assigned to the arm.

	Patient referral	Postal testing kit
	6 (month)	**6 (month)**
	N = 46	N = 49
Contacted all partners *Polarity: Higher values are better*	n = 36 ; % = 78	n = 41 ; % = 83
Contacted some partners *Polarity: Higher values are better*	n = 8 ; % = 17	n = 6 ; % = 12
Contacted none of partners *Polarity: Lower values are better*	n = 2 ; % = 4	n = 2 ; % = 4

	Patient referral	Postal testing kit
	6 (month)	**6 (month)**
	N = 46	N = 49
Total partners contacted in arm (mean per woman) *Polarity: Higher values are better*	51 (1.1)	53 (1.1)

Re-infection with chlamydia within 12 months

138 women returned at least 1 test during the trial. % are calculated by number of women who returned tests not total number in arm.

	Patient referral	Postal testing kit
	12 (month)	**12 (month)**
	N = 70	N = 68
Number of women re-infected *Polarity: Lower values are better*	n = 7 ; % = 10	n = 15 ; % = 22

Risk of chlamydia re-infection at 12 months

Hazard ratios are calculated by number of women who returned tests not total number in arm (n=138 in PR and PTK).

	Postal testing kit vs Patient referral
	12 (month)
	N1 = 70, N2 = 68
Risk of re-infection, hazard ratio (95% CI) *Polarity: Lower values are better*	2.35 (0.94 to 5.88)

Section	Risk of bias	Reason
Domain 1: Bias arising from the randomisation process	Low	Computer-generated randomisation, allocation concealed and no baseline differences between groups.
Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention)	Low	Participants and people delivering intervention were aware of assigned intervention. Co-interventions were balanced and intervention was delivered at recruitment so implementation failure unlikely and participants crossover not possible.
Domain 3. Bias due to missing outcome data	Some concerns	High attrition rate and possible that drop outs have different outcomes to remainers but no evidence to show this. Re-infection rate data accurate as all tests for study done in one laboratory. Reported reasons between arms are not different; not enough evidence to say that people have dropped out are different to those who remained in study
Domain 4. Bias in measurement of the outcome	Low	Laboratory-testing of chlamydia and laboratory scientists unlikely to know allocation.
Domain 5. Bias in selection of the reported result	Some concerns	Trial not registered
Overall bias and Directness	Some concerns	High attrition rate and no trial registration

Section	Risk of bias	Reason
	Overall Directness	Directly applicable

Estcourt, 2015

Bibliographic Reference	Estcourt, Claudia S; Sutcliffe, Lorna J; Copas, Andrew; Mercer, Catherine H; Roberts, Tracy E; Jackson, Louise J; Symonds, Merle; Tickle, Laura; Muniina, Pamela; Rait, Greta; Johnson, Anne M; Aderogba, Kazeem; Creighton, Sarah; Cassell, Jackie A; Developing and testing accelerated partner therapy for partner notification for people with genital Chlamydia trachomatis diagnosed in primary care: a pilot randomised controlled trial.; Sexually transmitted infections; 2015; vol. 91 (no. 8); 548-54

Study details

Study design	Randomised controlled trial (RCT)
Trial registration number	Registered UK Clinical Research Network Study Portfolio ID number 10123
Study start date	01-Sep-2011
Study end date	31-Jul-2013
Aim	To assess the feasibility, acceptability and preliminary evidence of effectiveness of accelerated partner therapy (APT) for women diagnosed with chlamydia in non-specialist settings.
Country/geographical location	UK
Setting	12 GP surgeries, and 3 community contraception and sexual health services and pharmacies in East London and the south coast of England.
Inclusion criteria	Women >16 years old. Diagnosed with chlamydia in primary care. At least one untreated contactable male sex partner in the last 6 months.
Exclusion criteria	**For index patients:**

	Known HIV positive status. Co-infection with other STIs. Inability to understand English. **For male partners:** Symptoms of complicated infection. Allergy or contraindications to azithromycin. Inability to understand English.
Method of randomisation	By simple computer-generated unrestricted randomisation within the web tool. Randomisation was applied to all contactable partners identified by the index.
Method of allocation concealment	Not reported.
Unit of allocation	1:1:1.
Unit of analysis	Partners treated within 6 weeks of diagnosis, reported either by calling the hotline, attending the pharmacy or reported by the index patient at a follow-up telephone assessment 4-6 weeks after treatment. Partners for whom information was unavailable were considered untreated in the analyses. Secondary outcome measures were whether the partner was notified, partner uptake of PN modes, number of partners treated per index patient, number of partners notified per index patient, time to partner treatment and reinfection/persistence rates in index patients. Reinfection/persistence was tested by a nucleic acid amplification test sent by post to the index patient.
Statistical method(s) used to analyse the data	Intention to treat analyses were conducted blind to group assignment. Logistic regression was used to calculated adjusted ORs comparing both APTHotline and APTPharmacy with standard PN. ORs were adjusted for age and ethnicity. Analyses conducted in Stata V.13. Aimed at recruiting 400 index patients – recruitment rates lower than anticipated, decision made to seek full outcome data for at least 200 patients across study arms.
Attrition	APTHotline: N=18 (25%) lost to follow-up for some secondary outcomes (index patient failed to respond to phone calls) APTPharmacy: N=36 (36%) lost to follow-up for some secondary outcomes (index patient failed to respond to phone calls) Standard partner notification: N=23 (23%) lost to follow-up for some secondary outcomes (index patient failed to respond to phone calls)
Funding	This paper presents independent research commissioned by the National Institute for Health Research (NIHR) under its Programme Grants for Applied Research scheme (RP-PG-0707-10208). In addition, support was received from the UK Medical Research Council for Centre funding (grant MR/K010174/1) and also the UK National Institute for Health Research Health Protection Research Unit (NIHR

	HPRU) in Modelling Methodology at Imperial College London in partnership with Public Health England (PHE) for funding (grant HPRU-2012-10080).
Study limitations	Blinding of participants and people giving the intervention was not possible due to intervention type.

Characteristics

Baseline characteristics were only available for index patients and not the partners. As the outcomes for the study are reported for partners, the numbers in this table will differ from those reported elsewhere.

Study-level characteristics

	Study (N = 199)
Age, median (IQR)	21 (19 to 23)
Gender, female	n = 199 ; % = 100
Ethnicity	
White British	n = 112 ; % = 56
White Other	n = 27 ; % = 14
Mixed	n = 10 ; % = 5
Black/Black British	n = 5 ; % = 3
Asian/Asian British	n = 18 ; % = 9
Other	n = 9 ; % = 5
Number of contactable sexual partners, mean (SD)	1.6 (1.01)

TIDieR Checklist

Study arms

As the outcomes for the study are reported for partners, N = are number of partners and n= are the number of index patients.

APTHotline (N = 111 partners; n=68 index patients)	
Brief name	APTHotline
Rationale/theory/Goal	More people need to make their sexual partners aware that they may be at risk of an STI. This automated service should make partner notification more streamlined and reliable to allow this to happen.
Materials used	A web tool. Text messages. APTHotline. APT pack. GUM clinic. Postal urine chlamydia retest.
Procedures used	When the index patient is treated, a text is sent to the sexual partner(s) inviting them to call the APT hotline. The telephone call is a consultation with a research Health Advisor. The partner collects an APT pack (contained pre-packaged azithromycin 1 g, condoms, chlamydia information leaflet, a urine sample collection kit for Chlamydia trachomatis nucleic acid amplification test (NAAT) with instructions to provide the sample before taking the antibiotics, prepaid postal envelope and packaging for returning the sample to the study clinic, and a patient information leaflet about the study) from the study GUM clinic or pharmacy. The partner also attends a HIV and syphilis test at a later date. Index patient and partner(s) receive follow-up call 4-6 weeks after treatment. The index patient receives and sends back a postal urine chlamydia test at 6 weeks.
Method of delivery	Initial text, followed by telephone call, in person treatment and follow-up call.
Setting/location of intervention	GUM clinic and/or pharmacy.
Intensity/duration of the intervention	6 weeks from finishing treatment.
Tailoring/adaptation	None.
Unforeseen modifications	Not reported; likely none.

Actual treatment fidelity	See attrition.
APTPharmacy (N = 100 partners; n=65 index patients)	
Brief name	APTPharmacy.
Rationale/theory/Goal	More people need to make their sexual partners aware that they may be at risk of an STI. This automated service should make partner notification more streamlined and reliable to allow this to happen.
Materials used	Web tool. Text message. Pharmacy consultation. APT pack. GUM clinic. Follow-up phone call. Postal urine chlamydia retest.
Procedures used	When the index patient is treated, a text is sent to the sexual partner(s) inviting them to attend a pharmacy consultation with a trained pharmacist. There, the partner collects an APT pack (contained pre-packaged azithromycin 1 g, condoms, chlamydia information leaflet, a urine sample collection kit for Chlamydia trachomatis nucleic acid amplification test (NAAT) with instructions to provide the sample before taking the antibiotics, prepaid postal envelope and packaging for returning the sample to the study clinic, and a patient information leaflet about the study). The partner also attends a HIV and syphilis test at a later date. Index patient and partner(s) receive follow-up call 4-6 weeks after treatment. The index patient receives and sends back a postal urine chlamydia test at 6 weeks.
Method of delivery	Initial text message, followed by face-to-face consultation, then follow-up call and postal urine chlamydia retest.
Setting/location of intervention	Pharmacy and GUM clinic.
Intensity/duration of the intervention	4-6 weeks after treatment finished.
Tailoring/adaptation	None.
Unforeseen modifications	Not reported; not likely.

Actual treatment fidelity	See attrition.

Standard PN (N = 102 partners; n=66 index patients)

Brief name	Standard PN.
Rationale/theory/Goal	Partner notification has been shown as a good method for reducing the onward infection of other people with STIs. This arm is the control arm for the study.
Materials used	Traditional healthcare setting e.g. GP surgery, GUM or CASH service. Follow-up call. Postal urine chlamydia retest at 6 weeks.
Procedures used	The index patient is treated and advised to tell partners to be tested and treated. The partner(s) attend a traditional setting for treatment. Index patients and partners receive follow-up phone call and the index patient receives a postal urine chlamydia retest at 6 weeks.
Method of delivery	Face-to-face and telephone calls. The index patient chose how best to contact their partner(s).
Setting/location of intervention	Traditional healthcare setting.
Intensity/duration of the intervention	4-6 weeks from end of treatment; 6 weeks until postal urine chlamydia retest.
Tailoring/adaptation	None.
Unforeseen modifications	None reported; not likely.
Actual treatment fidelity	See attrition.

Outcomes

Study timepoints	6 (week)

Treatment and notification of contactable partners by arm

As the outcomes for the study are reported for partners, N = are number of partners not index patients.

	APTHotline	APTPharmacy	Standard partner notification
	6 (week)	**6 (week)**	**6 (week)**
	N = 111 partners	N = 100 partners	N = 102 partners
Number of partners treated	n = 39 ; % = 35	n = 46 ; % = 46	n = 46 ; % = 45
Number of partners notified	n = 75 ; % = 68	n = 66 ; % = 66	n = 75 ; % = 74
Index patient reinfection/persistence Only 38 patients returned a postal urine sample *Polarity: Higher values are better*	n = 0 ; % = 0	n = 1 ; % = 10	n = 2 ; % = 15

Odds of partner treatment or notification vs standard PN

Results from logistic regression for the likelihood that a partner was treated and notified by APTHotline and APTPharmacy compared with standard PN.

	APTHotline vs Standard partner notification	APTPharmacy vs Standard partner notification
	6 (week)	**6 (week)**
	N1 = 111, N2 = 102	N1 = 100, N2 = 102
Partner notification ORs (95% CI) adjusted for index age and ethnicity	0.91 (0.48 to 1.73)	0.9 (0.65 to 1.27)
Partner notification	0.97 (0.74 to 1.16)	0.96 (0.85 to 1.23)

	APTHotline vs Standard partner notification	APTPharmacy vs Standard partner notification
	6 (week)	**6 (week)**
	N1 = 111, N2 = 102	N1 = 100, N2 = 102
RRs (95% CI), calculated from OR above		
Partner treatment ORs (95% CI) adjusted for index age and ethnicity	0.64 (0.35 to 1.18)	1.06 (0.78 to 1.45)
Partner treatment RRs (95% CI), calculated from OR above	0.73 (0.45 to 1.11)	1.03 (0.87 to 1.20)

Section	**Risk of bias**	**Reason**
Domain 1: Bias arising from the randomisation process	Low	Allocation sequence random and concealed until participants were enrolled. No baseline differences between groups.
Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention)	Low	Blinding was not possible due to nature of trial but no deviations could arise during trial and ITT analysis was carried out
Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention)	Low	Blinding not possible and they would have been aware it was a trial. However, appropriate analyses used to assess the effect of adhering to intervention.

Section	Risk of bias	Reason
Domain 3. Bias due to missing outcome data	Some concerns	20% attrition. Higher attrition in APTPharmacy arm but not analysis to assess if it would have impacted on the result. There is noticeably more people missing from the APTPharmacy arm than the other arms. Missingness in APTPharmacy arm likely to be down to people less likely to go to a face-to-face consultation rather than a phone consultation, and not on true value.
Domain 4. Bias in measurement of the outcome	Low	Measurement was the same across arms. Even though participants were aware of their assignment, it was unlikely to affect outcome data since the measures are objective.
Domain 5. Bias in selection of the reported result	Some concerns	Registration noted but protocol not found.
Overall bias and Directness	Some concerns	For missing outcome data and selection in the reported result.
	Overall Directness	Directly applicable

Kissinger, 2005

Bibliographic Reference Kissinger, Patricia; Mohammed, Hamish; Richardson-Alston, Gwangi; Leichliter, Jami S; Taylor, Stephanie N; Martin, David H; Farley, Thomas A; Patient-delivered partner treatment for male urethritis: a randomized, controlled trial.; Clinical infectious diseases : an official publication of the Infectious Diseases Society of America; 2005; vol. 41 (no. 5); 623-9

This study used the term 'Booklet-enhanced patient referral' for the intervention arm, which implied it was a form of enhanced patient referral. However, the intervention was provision of patient referral cards to give to their index partner. This is more consistent with the definition of simple referral using contact slips so this study was considered to be a comparison of simple patient referral using contact slips and simple patient referral without contact slips.

Study details

Trial registration number	Not reported

Study start date	Dec-2001
Study end date	Mar-2004
Aim	To examine the efficacy of booklet-enhanced patient referral (BEPR) compared with standard patient referral (PR) concerning partner treatment and index patient reinfection. The study also assessed a patient-delivered partner treatment (PDPT) arm which was not extracted for this review as it was not included in the protocol.
Country/geographical location	Louisiana, USA
Setting	1 sexual health clinic
Inclusion criteria	Men who had received a diagnosis of urethritis and had tested positive for *C. trachomatis* or *N. gonorrhoeae* 16-44 years old Had at least 1 female sex partner who did not accompany them to the clinic
Method of randomisation	Index patients were randomised by month in which they attended the clinic, and the months were randomly allocated among the 3 study arms. Randomisation of months was conducted using a blocked scheme of 3 or 6 units (i.e. months) using Microsoft Excel software.
Method of allocation concealment	Not reported
Unit of allocation	Index patients
Unit of analysis	Behavioural outcomes such as participant saw partner, talked to partner about infection, checked to see whether partner was treated and partner reported to participant that the medication was taken. Sexual outcomes such as participant had unprotected sex before partner took medication, and participant had unprotected sex with any partner.
Statistical method(s) used to analyse the data	No information provided on data analysis method.
Attrition	78.8% of index patients returned for a follow-up interview Of the 770 men who completed the follow-up interview, 37.5% provided a follow-up urine or urethral swab sample

Study limitations	There was no 'test of cure' conducted, and because men were tested 1 month following their initial visits, it was not possible to determine whether the follow-up infections were reinfections from original partners, new infections from newly acquired partners, or persistence of the original infection. The rate of follow-up testing was low (only 37.5%)

Characteristics

Study-level characteristics

	Study (N = 977)
Age, ≥24 years (%)	51.6
Gender, male	N = 977; 100%
Ethnicity, African American	95.7%

Outcomes

Study timepoints	4 (week)

Behavioural and sexual outcomes by intervention arm

N is greater than the study sample because most men (68.3%) reported ≥2 sex partners at baseline and reported information on 1520 partners across the 3 study arms (PDPT arm excluded from this review). Outcomes are reported for partnerships not index patients.

	Patient referral	Booklet-enhanced patient referral
	4 (week)	**4 (week)**
	N = 579	N = 707
Patient talked to partner about infection *Polarity: Higher values are better*	N = 284; % = 49.1	n = 373; % = 52.8
Patient checked to see whether partner was treated *Polarity: Higher values are better*	n = 249 ; % = 43	n = 331 ; % = 46.8
Partner reported to index patient that treatment was taken *Polarity: Higher values are better*	n = 202 ; % = 35	n = 322 ; % = 45.6
Patient saw partner taking the treatment *Polarity: Higher values are better*	n = 157 ; % = 27.1	n = 230 ; % = 32.6
Patient gave intervention to partner *Polarity: Higher values are better*	n = 284 ; % = 49	n = 412 ; % = 58.3
Patient had unprotected sex before partner took medication *Polarity: Lower values are better*	n = 74 ; % = 12.7	n = 72 ; % = 10.2
Patient had unprotected sex with any partner *Polarity: Lower values are better*	n = 200 ; % = 34.6	n = 224 ; % = 31.7

Study details

Procedures used	At baseline, information about each sexual partner was elicited from index patients using a computer-assisted self-interview (CASI). Questions on the CASI also included information about sexual behaviour, condom use and treatment for each partner identified. All patients were asked to return 4 weeks after the initial clinic visit (with a window of 2-8 weeks) for a follow-up interview and to provide a urine sample or urethral swab for STI testing. Men were given the option of being interviewed by study staff or undergoing CASI. Men were asked outcome questions for each partner identified on the baseline survey and about any new partners acquired in the follow-up period. Participants received a small monetary reimbursement for their time ($10-$40) depending on their level of participation

Study arms

Patient referral (N = 285)

Procedures used	Index patients were instructed to inform their partner(s) that they needed to go to an STI clinic for testing and treatment.
Setting/location of intervention	Sexual health clinics
Intensity/duration of the intervention	4 weeks between baseline and follow-up interviews (with a window of 2-8 weeks)
Tailoring/adaptation	None reported
Unforeseen modifications	Not reported; unlikely
Planned treatment fidelity	Not reported
Actual treatment fidelity	Not reported

Booklet-enhanced patient referral (N = 348)

Rationale/theory/Goal	Providing index patients with something to give to their sexual partners may act as an incentive to tell them or may make the process of notifying partners easier.
Materials used	Wallet-sized booklets containing 4 tear-out cards with information for the partner and treatment guidelines for the professionals who would see the partners.
Procedures used	Index patients were given a wallet-sized booklet containing 4 tear-out cards that could be given to their sexual partners. The cards contained information for partners about the STI and treatment guidelines for the professionals who would see them. The partners could present this card at a clinic of their choice to help their clinician treat them. If men had more than 4 partners they were given additional booklets.
Setting/location of intervention	Sexual health clinics
Intensity/duration of the intervention	4 weeks between baseline and follow-up interviews (with a window of 2-8 weeks)
Tailoring/adaptation	None reported
Unforeseen modifications	Not reported; unlikely
Planned treatment fidelity	Not reported
Actual treatment fidelity	Not reported

Section	**Risk of bias**	**Reason**
Domain 1: Bias arising from the randomisation process	Low	No information on allocation concealment but no baseline imbalances

Section	Risk of bias	Reason
Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention)	Low	Participants and people delivering the intervention aware of assigned intervention but no deviations from protocol
Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention)	Low	Participants and people delivering the intervention were aware of assigned intervention but intervention delivered immediately so was successful for all or almost all participants
Domain 3. Bias due to missing outcome data	High	78.8% follow up and no differences in attrition by intervention arm for behavioural outcomes, but only 37.5% provided urine or urethral specimens at follow-up and differences in attrition by intervention arm for STI follow up outcomes)
Domain 4. Bias in measurement of the outcome	Low	Method for measuring outcome appropriate and the same for each gropu
Domain 5. Bias in selection of the reported result	Some concerns	Trial not registered
Overall bias and Directness	Some concerns	Problems with high attrition and differential attrition by intervention arm for STI outcome data. Trial not registered
	Overall Directness	Directly applicable

Kissinger, 2006

Bibliographic Reference	Kissinger, P; Schmidt, N; Mohammed, H; Leichliter, JS; Gift, TL; Meadors, B; Sanders, C; Farley, TA; Patient-delivered partner treatment for Trichomonas vaginalis infection: a randomized controlled trial; Sexually transmitted diseases; 2006; vol. 33 (no. 7); 445-450

This study used the term ‘Booklet-enhanced patient referral’ for the intervention arm, which implied it was a form of enhanced patient referral. However, the intervention was provision of patient referral cards to give to their index partner. This is more consistent with the definition of simple referral using contact slips so this study was considered to be a comparison of simple patient referral using contact slips and simple patient referral without contact slips.

Study details

Trial registration number	Not reported.
Study start date	Dec-2001
Study end date	Aug-2004
Aim	To examine the efficacy of booklet-enhanced patient referral (BEPR) compared with standard patient referral (PR) concerning partner treatment. The study also assessed a patient-delivered partner treatment (PDPT) arm which was not extracted for this review as it was not included in the protocol.
Country/geographical location	Louisiana, USA.
Setting	1 sexual health clinic
Inclusion criteria	Culture-confirmed diagnosis of TV. Not in first trimester of pregnancy. Had no medical contraindication to metronidazole or bringing metronidazole to a partner. Had at least 1 male sex partner in the last 60 days.
Method of randomisation	No information on randomisation sequence.
Method of allocation concealment	Previously prepared envelopes.
Unit of allocation	Blocks of 3 or 6 units using Excel.
Unit of analysis	Behavioural outcomes such as participant saw partner, talked to partner about infection, checked to see whether partner was treated and partner reported to participant that the medication was taken. Sexual outcomes such as participant had unprotected sex before partner took medication, and participant had unprotected sex with any partner.

Statistical method(s) used to analyse the data	Data analysis was conducted using SAS 9.0 and DATA Pro 1.0. For partner-level analyses, bivariate and multivariate analyses were conducted using generalized estimating equations (GEE) to accommodate the intraclass correlation that exists for multiple partners per index woman. For index- level analyses, logistic regression was conducted.
Attrition	89% returned for a follow-up visit. 82% returned to retest for TV.
Funding	This research was supported by Centers for Disease Control and Prevention Cooperative Agreement R30/CCR619146, “Optimizing Partner Treatment Strategies.”

Characteristics

Study-level characteristics

	Study (N = 463)
Age, mean (SD)	25.8 (6.8)
Gender, women	n = 463 ; % = 100
Ethnicity, Black	n = 459 ; % = 99.1

Study details

Procedures used	Because there was no consistently used clinic protocol for counselling women for TV, study staff counselled women for 10-20 minutes on all arms about TV and the importance of partner treatment using a standard protocol. Information about each partner was elicited from the index women at baseline and 1 month using a computer-assisted self-interview (CASI). Questions were modelled after the Infertility Prevention Program multi-centred trial and were adapted and pilot tested before use. Questions on the CASI included information about sexual behaviour, condom use, and treatment for each partner identified. Patients were asked to return 4 weeks after their initial visit (with a window of 2–8 weeks) for a follow-up interview and a gynaecological examination for TV culture. Women who retested positive were retreated with the 7-day dose and asked to return 1 month later. After the second dose, if the woman remained positive, a sample of the vaginal fluids was sent to the Centers for Disease Control and Prevention for metronidazole-resistance testing. If a woman was interviewed over the phone but did not have a pelvic examination, she was given a smaller incentive. Women were asked outcome questions for each partner identified on the baseline survey and were also asked questions of any new partners acquired in the follow-up period. The outcome of interest was the response to this question: “Did [partner name] tell you that he took the medicine?”

	Participants received $10 for baseline interviews, $20 for returning to the clinic for follow-up and $10 in the field. This was increased to $30 after the first 2 years to improve follow-up rates.
Setting/location of intervention	Sexual health clinics
Intensity/duration of the intervention	Mean 4 weeks between baseline and follow-up (range 2 to 8 weeks)
Tailoring/adaptation	None
Unforeseen modifications	Not reported; unlikely.
Planned treatment fidelity	Not reported
Actual treatment fidelity	See attrition

Study arms

Patient referral (N = 155)

Procedures used	Women were instructed to tell their partners that they needed to go to a clinic for STI evaluation and treatment. Because there was no consistently used clinic protocol for counselling women for TV, study staff counselled women for 10-20 minutes on all arms about TV and the importance of partner treatment using a standard protocol. Information about each partner was elicited from the index women at baseline and 1 month using a computer-assisted self-interview (CASI). Questions were modelled after the Infertility Prevention Program multi-centred trial and were adapted and pilot tested before use. Questions on the CASI included information about sexual behaviour, condom use, and treatment for each partner identified. Patients were asked to return 4 weeks after their initial visit (with a window of 2–8 weeks) for a follow-up interview and a gynaecological examination for TV culture. Women who retested positive were retreated with the 7-day dose and asked to return 1 month later. After the second dose, if the woman remained positive, a sample of the vaginal fluids was sent to the Centers for Disease Control and Prevention for metronidazole-resistance testing. If a woman was interviewed over the phone but did not have a pelvic examination, she was given a smaller incentive. Women were asked outcome questions for each partner identified on

	the baseline survey and were also asked questions of any new partners acquired in the follow-up period. The outcome of interest was the response to this question: “Did [partner name] tell you that he took the medicine?” Participants received $10 for baseline interviews, $20 for returning to the clinic for follow-up and $10 in the field. This was increased to $30 after the first 2 years to improve follow-up rates.

Booklet-enhanced patient referral (N = 154)

Rationale/theory/Goal	Providing women with something to pass onto their partners may act as an incentive to tell them.
Materials used	Leaflets with information on treatment.
Procedures used	Women were given a wallet-sized booklet containing 4 tear-out cards with information for the partner and treatment guidelines for the providers that would see the partners. The partners could then present this card at a clinic to help the clinician better treat them. If women had more than 4 partners, they were given additional booklets. Because there was no consistently used clinic protocol for counselling women for TV, study staff counselled women for 10-20 minutes on all arms about TV and the importance of partner treatment using a standard protocol. Information about each partner was elicited from the index women at baseline and 1 month using a computer-assisted self-interview (CASI). Questions were modelled after the Infertility Prevention Program multi-centered trial and were adapted and pilot tested before use. Questions on the CASI included information about sexual behaviour, condom use, and treatment for each partner identified. Patients were asked to return 4 weeks after their initial visit (with a window of 2–8 weeks) for a follow-up interview and a gynaecological examination for TV culture. Women who retested positive were retreated with the 7-day dose and asked to return 1 month later. After the second dose, if the woman remained positive, a sample of the vaginal fluids was sent to the Centers for Disease Control and Prevention for metronidazole-resistance testing. If a woman was interviewed over the phone but did not have a pelvic examination, she was given a smaller incentive. Women were asked outcome questions for each partner identified on the baseline survey and were also asked questions of any new partners acquired in the follow-up period. The outcome of interest was the response to this question: “Did [partner name] tell you that he took the medicine?” Participants received $10 for baseline interviews, $20 for returning to the clinic for follow-up and $10 in the field. This was increased to $30 after the first 2 years to improve follow-up rates.

Outcomes

Study timepoints	4 (week)

Behavioural and sexual outcomes by intervention arm

	Patient referral	Booklet-enhanced partner referral
	4 (week)	**4 (week)**
	N = 155	N = 147
Participant talked to partner about infection *Polarity: Higher values are better*	n = 136 ; % = 87.7	n = 123 ; % = 83.7
Participant checked to see whether partner was treated *Polarity: Higher values are better*	n = 117 ; % = 75.5	n = 93 ; % = 63.3
Partner reported to index patient that the medication was taken *Polarity: Higher values are better*	n = 109 ; % = 70.4	n = 85 ; % = 57.6
Participant saw partner taking the medication *Polarity: Higher values are better*	n = 28 ; % = 18.2	n = 30 ; % = 20.4
Participant gave intervention to partner *Polarity: Higher values are better*	n = 136 ; % = 87.7	n = 111 ; % = 75.5
Participant had unprotected sex before partner took medication *Polarity: Lower values are better*	n = 8 ; % = 5.3	n = 9 ; % = 6.3
Participant had unprotected sex with any partner *Polarity: Lower values are better*	n = 24 ; % = 15.2	n = 26 ; % = 17.6

Section	Risk of bias	Reason
Domain 1: Bias arising from the randomisation process	Some concerns	No detail on randomisation sequence and participants characteristics reported for whole study not per arm making it difficult to assess baseline differences.
Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention)	Low	Participants and people delivering the intervention aware of assigned intervention but no deviations from protocol. Intention to treat analyses used.
Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention)	Low	Participants and people delivering the intervention aware of assigned intervention but intervention delivered immediately so was successful for all or almost all participants
Domain 3. Bias due to missing outcome data	Low	11% attrition
Domain 4. Bias in measurement of the outcome	Low	Method for measuring outcome appropriate and the same for each group. Measurements were objective.
Domain 5. Bias in selection of the reported result	Some concerns	Trial not registered
Overall bias and Directness	Some concerns	Problems with randomisation process and trial not registered
	Overall Directness	Directly applicable

Schwebke, 2010

Bibliographic Reference	Schwebke, Jane R; Desmond, Renee A; A randomized controlled trial of partner notification methods for prevention of trichomoniasis in women.; Sexually transmitted diseases; 2010; vol. 37 (no. 6); 392-6

Study details

Study design	Randomised controlled trial (RCT)

Trial registration number	Not reported.
Study start date	Feb-2003
Study end date	Jun-2008
Aim	To compare the effectiveness of 3 methods of partner notification of women with vaginal trichomoniasis: patient referral of partners (standard practice), delivery of curative therapy to partners by patients themselves (this practice is illegal in the UK and so it is excluded in this review), and accelerated consultation and therapy for partners by trained disease intervention specialists (DIS).
Country/geographical location	Alabama, USA.
Setting	1 STI clinic (Jefferson County Department of Health in Birmingham).
Inclusion criteria	Women >19 years old. Culture or wet prep positive for Trichomonas vaginalis.
Exclusion criteria	Infection with other STI pathogens requiring intervention. Pregnant or currently breastfeeding. Ingestion of alcohol within previous 8 hours or plans to drink within 24 hours following treatment. Allergy to metronidazole. Presence of sexual partner in clinic at time of enrolment. A history of referral by a partner already treated for trichomoniasis. >4 sexual partners in the preceding 30 days.
Method of randomisation	Not reported.
Method of allocation concealment	Not reported.
Unit of allocation	Not reported.

Unit of analysis	Reinfection at 1 and 3 months.
Statistical method(s) used to analyse the data	An intention-to-treat analysis was conducted on all women who were randomized and received either of one of the study interventions and had a least one follow-up after the test of cure visit. The PR group that consisted of usual care was considered the reference group. The proportion of women who exhibit repeat infection was calculated across the 3 groups with pairwise comparisons (DIS vs. PR, PR vs. PDPT) using the chi-squared test or Fisher exact test, and 95% confidence intervals were computed. Descriptive characteristics across the 3 groups were compared by the chi-square test (for proportions) or Fisher exact test or ANOVA for continuous variables.
Attrition	290 (60%) dropped out across all groups.
Funding	Supported by NIH grant Control of Trichomoniasis—-a Paradigm for STD Control, R01AI050718.
Study limitations	High attrition rate

Characteristics

Arm-level characteristics

	Partner referral (N = 160)	**DIS (N = 162)**
Age, mean (SD)	29.1 (7.8)	27.8 (7.9)
Gender, female	n = 160 ; % = 100	n = 162 ; % = 100
Number of partners (n)	179	179
Ethnicity		
African-American	n = 153 ; % = 95.6	n = 155 ; % = 95.7
White	n = 5 ; % = 3.1	n = 5 ; % = 3.1

	Partner referral (N = 160)	DIS (N = 162)
Other	n = 2 ; % = 1.3	n = 2 ; % = 1.2

TIDieR Checklist

Study arms

Patient referral (N = 160)	
Brief name	n/a
Rationale/theory/Goal	This was the reference arm for the study, as it is standard practice to tell people to let their partners know about their STI diagnosis.
Materials used	Encouragement to notify partners. Treatment for confirmed cases in the partners.
Procedures used	Standard messages were given to participants on the importance of partner notification to prevent reinfection. They were asked to tell their partners to attend a clinic for evaluation and treatment. Partners were offered participation in the male sub-study if they did attend. They completed a brief questionnaire was administered and urethral and urine specimens were collected for testing for Trichomonas. All partners diagnosed with Trichomonas were given metronidazole 2g. Index women were asked to return to the clinic 5 to 9 days after enrolment and treatment for a “test of cure” evaluation to assure the success of treatment.
Provider	STI clinic
Method of delivery	Face-to-face
Setting/location of intervention	see above
Intensity/duration of the intervention	1 session and then however long partner notification takes. Longest follow-up is 3 months.

Tailoring/adaptation	None.
Unforeseen modifications	Not reported; not likely.
Planned treatment fidelity	Not reported.
Actual treatment fidelity	402 women returned for their 5- to 9-day visit; 40% completed the whole study. No data on how many women completed interventions in each arm.

Disease Intervention Specialists (N = 162)

Brief name	n/a
Materials used	Provider notification by phone. Face-to-face consultation. Treatment if presenting to clinic. Follow-up of male partners after 2 days.
Procedures used	Women were interviewed by disease intervention specialists (DIS) and entered into a verbal contract to allow them to notify partners on behalf of the woman. Partners were contacted by telephone within 1 to 2 days of the woman's enrolment and told specifically which clinic nurse to contact. Male partners presenting to the clinic as a result of this interaction were consented for the study and treated with metronidazole 2-g stat dose. In addition, urethral and urine specimens were obtained for testing for trichomonas and a brief questionnaire administered. If treatment could not be verified, exposed partners were notified about this. For partners unwilling to come to clinic for treatment, interaction with the patient in the field consisted of educational messages, and delivery of medication.
Provider	STI clinic.
Method of delivery	In person and over the phone.

Setting/location of intervention	STI clinic.
Intensity/duration of the intervention	2 days.
Tailoring/adaptation	None.
Unforeseen modifications	None reported; not likely.
Planned treatment fidelity	Not reported.
Actual treatment fidelity	402 women returned for their 5- to 9-day visit; 40% completed the whole study. No data on how many women completed interventions in each arm.

Outcomes

Study timepoints	1 (month) 3 (month)

Trichomonas reinfection at 1-month and 3-month follow-up

	Patient referral		**DIS**	
	1 (month)	**3 (month)**	**1 (month)**	**3 (month)**
	N = 92	N = 60	N = 100	N = 64
Number of women with trichomonas reinfection, mean (SD; 95% CI) Regression used to estimate missing data so has been reported as mean (SD; 95% CI). Reliability of the data is doubtful and so has not been pooled in analyses	9 (9.8; 5.3 to 19)	3 (5; 1 to 13.9)	15 (15; 8.7 to 23.5)	5 (7.8; 2.6 to 17.3)

	Patient referral		DIS	
	1 (month)	3 (month)	1 (month)	3 (month)
	N = 92	N = 60	N = 100	N = 64
Polarity: Lower values are better				

Trichomonas reinfection at 1-month and 3-month follow-up (relative risk between groups)

	Patient referral vs DIS	
	1 (month)	3 (month)
	N1 = 92, N2 = 100	N1 = 60, N2 = 64
Risk of Trichomonas reinfection, relative risk (95% CI) *Polarity: Lower values are better for patient referral*	1.24 (0.88 to 1.74)	1.23 (0.7 to 2.16)

Section	Question	Answer
Domain 1: Bias arising from the randomisation process	Low	No information on how randomisation sequence was generated but no baseline imbalances
Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention)	Low	Not possible to blind but also not possible to deviate. Intention to treat analyses conducted.
Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention)	High	Not possible to blind. Men who did not attend clinic in the DIS arm were provided with education and delivery of medication. No analyses to estimate the effect of adhering to intervention conducted.

Section	Question	Answer
Domain 3. Bias due to missing outcome data	Some concerns	60% attrition. No sensitivity analyses or correction form bias. Women were excluded because of recurrent or persistent trichomonas infection. Proportions of missing outcome data does not differ between groups.
Domain 4. Bias in measurement of the outcome	Low	Method for measuring outcome appropriate and the same between groups. Outcomes assessors were aware of intervention received but unlikely to have been influenced by this knowledge.
Domain 5. Bias in selection of the reported result	Some concerns	Trial not registered
Overall bias and Directness	High	For effect of assignment to intervention
	Overall Directness	Directly applicable

Tomnay, 2006

Bibliographic Reference	Tomnay, J E; Pitts, M K; Kuo, T C; Fairley, C K; Does the Internet assist clients to carry out contact tracing? A randomized controlled trial using web-based information.; International journal of STD & AIDS; 2006; vol. 17 (no. 6); 391-4

Study details

Study design	Randomised controlled trial (RCT)
Trial registration number	Not reported.
Study start date	Jul-2003
Study end date	Jul-2004

Aim	To determine the safety and acceptability of a website for use in contact tracing when used with a standard partner letter, compared with a standard partner letter alone.
Country/geographical location	Australia.
Setting	1 sexual health clinic, Melbourne.
Inclusion criteria	Diagnosed with chlamydia or non-gonococcal urethritis. >16 years old. Had contactable partners who had not been notified. Spoke English.
Exclusion criteria	None reported.
Method of randomisation	Block randomisation was done by a computer random number generator (SPSS) for sequences between 1-27. 18 were randomised to the website and 9 to the standard letter.
Method of allocation concealment	Identical thickened, opaque, thoroughly sealed envelopes were given to participants.
Unit of analysis	Primary outcome was to determine the acceptability of the web-based tool for contact tracing. Secondary outcome was the proportion of contacts traced.
Statistical method(s) used to analyse the data	SPSS was used to conduct chi squared, Fisher's exact and t-tests.
Attrition	Standard letter and website: At follow-up, 1 person had withdrawn and 4 were lost to follow-up (7% attrition) Standard letter: At follow-up, 0 people had withdrawn and 3 were lost to follow-up (10% attrition)
Funding	Not reported.
Study limitations	The study is more focused on acceptability of the intervention. Low participant numbers. Little detail on statistical methods.

Characteristics

Study-level characteristics

	Study (N = 105)
Age, median (range)	27 (18 to 58)
Gender, men - number who finished the trial	76
Participants with <3 partners	66
Ethnicity	Not reported.

Arm-level characteristics

	Standard letter and website (N = 73)	Standard letter (N = 32)
Gender, men	n = 51 ; % = 75	n = 25 ; % = 86
Participants with <3 partners	n = 46 ; % = 68	n = 20 ; % = 69

TIDieR Checklist

Study details

Brief name	n/a
Rationale/theory/Goal	Partner notification can enhance screening programmes to reduce the prevalence of chlamydia. People have changed the way they communicate so this study assessed if newer technology can have an added effect on partner notification done by a standard letter.
Materials used	Standard letter for contact tracing. URLs for resources on chlamydia and non-gonococcal urethritis.
Procedures used	Index patients provided contact details for partners who then received a standard letter notifying them. At the time of diagnosis, index patients were given either standard letters, or standard letters with the website address, user ID and password to pass onto their partners.

	Partners of index patients randomised to the website arm were sent URLs to sites that provided information on chlamydia and non-gonococcal urethritis. These URLs were restricted to study participants, who had to use a user ID and password to access the site, which were non-searchable, to prevent contamination between arms. It also provided a printable letter to take to their own doctor. The website provided an onward address for the Melbourne Sexual Health Centre website. All participants were contacted via telephone one week after attending clinic and were interviewed regarding the number of partners contacted. Participants in the standard letter only arm did not receive any information about the website to pass onto their partners. The interventions are otherwise identical.
Method of delivery	Letter and website.
Setting/location of intervention	Sexual Health Clinics
Intensity/duration of the intervention	12 weeks.
Tailoring/adaptation	None.
Unforeseen modifications	None reported.
Actual treatment fidelity	<10% attrition.

Outcomes

Study timepoints	12 (week)

Partners traced between arms

	Standard letter and website vs Standard letter
	12 (week)
	N1 = 68, N2 = 29
%traced all contactable partners, OR (95% CI) *Polarity: Higher values are better*	0.63 (0.23 to 1.69)
%traced all contactable partners, RR (95% CI) calculated from ORs *Polarity: Higher values are better*	0.79 (0.40 to 1.23)
%traced any contactable partner, OR (95% CI) *Polarity: Higher values are better*	0.97 (0.81 to 1.16)
%traced any contactable partner, RR (95% CI) calculated from ORs *Polarity: Higher values are better*	1.00 (0.96 to 1.02)

Number of partners traced

N= total number of partners identified by the index patients. %traced all contactable partners is calculated based on the number of women in the study.

	Standard letter and website	Standard letter
	12 (week)	**12 (week)**
	N = 161	N = 69
Number of partners traced *Polarity: Higher values are better*	102 (63%)	50 (72%)

	Standard letter and website	Standard letter
	12 (week)	**12 (week)**
	N = 161	N = 69
%traced all contactable partners *Polarity: Higher values are better*	n = 37 ; % = 55	n = 19 ; % = 65
%traced any contactable partner *Polarity: Higher values are better*	n = 57 ; % = 84	n = 25 ; % = 86
Number partners traced per person, mean *Polarity: Higher values are better*	1.5	1.7

Section	Risk of bias	Reason
Domain 1: Bias arising from the randomisation process	Low	Allocation sequence random and concealed. No baseline imbalances.
Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention)	Some concerns	Unlikely participants were aware of assignment because websites were only visible to partners. Per protocol analyses used. Similar attrition in both groups and it was not possible for people in the standard letter arm to access the website of the treatment arm.
Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention)	High	Failure to provide the letters to the index patients would have lowered the number of partners contacted. Per protocol analyses conducted. Cannot rule out effect of failing to implement intervention on outcome.
Domain 3. Bias due to missing outcome data	Low	Attrition <10%

Section	Risk of bias	Reason
Domain 4. Bias in measurement of the outcome	Low	Measurement of outcome appropriate and the same between groups.
Domain 5. Bias in selection of the reported result	Some concerns	Trial not registered.
Overall bias and Directness	High	For deviations from the intended interventions (effect of adhering)
	Overall Directness	Directly applicable

Wilson, 2009

Bibliographic Reference	Wilson, Tracey E; Hogben, Matthew; Malka, Edmond S; Liddon, Nicole; McCormack, William M; Rubin, Steve R; Augenbraun, Michael A; A randomized controlled trial for reducing risks for sexually transmitted infections through enhanced patient-based partner notification.; American journal of public health; 2009; vol. 99suppl1; 104-10

Study details

Study design	Randomised controlled trial (RCT)
Trial registration number	Not reported.
Study start date	Jan-2002
Study end date	Dec-2004
Aim	To assess if patient referral would be more effective if people were motivated and prepared with the skills to contact sexual about their risk for STI, and to influence the health-seeking behaviours of their sexual partners.
Country/geographical location	New York City, USA

Setting	2 STI clinics; 1 non–Department of Health clinic and 1 Department of Health clinic.
Inclusion criteria	Microbiologically confirmed diagnosis of C trachomatis (chlamydia) or N gonorrhoea. >18 years old. Able to complete an interview in English or Spanish. Sexually active within the last 2 months prior to enrolment. Residing in the New York City area for the evaluation period.
Method of randomisation	A stratified block randomisation algorithm, with stratification by site of recruitment and gender within site. Numbers were generated by a random number generator. The principal investigator preassigned study identification numbers to groups by using the random number generator, and participants were assigned study identification numbers sequentially as they enrolled in the study.
Method of allocation concealment	Not reported. Health educators were aware of participants' allocations so they could provide the correct programme activities (intervention or control) to the right people.
Unit of analysis	**Primary outcomes:** Self-reported sexual partner notification (1-month follow-up). Deleterious effects of partner notification, such as arguments or violence (1 month). **Secondary outcomes:** Safer sexual behaviour (6-month follow-up; previous 90 days) STI infection in participants at 6 months. Consistency of condom use.
Statistical method(s) used to analyse the data	ANOVA and chi squared tests were used to assess if there were any differences in predictor variables between people who accepted versus declined to study; people who remained in the study versus people who dropped out; and between people in intervention versus control groups. Intention to treat analyses may have been conducted, and the missing data accounted for by multiple logistic regression. Generalised estimating equations were used to account for study design, as gender was nested within site. Intervention group was the primary independent variable, adjusted for age, baseline number of partners, and baseline diagnosis. The effect of gender was assessed within each intervention group for the 3 outcomes. Significance level was set at 0.05 (2-tailed). All statistical analyses were done on SPSS v15.0.
Attrition	Intervention group: 17 (94%) dropout at 1-month follow-up; 41 (13%) drop out at 6-month follow-up. Control group: 11 (4%) drop out at 1-month follow-up; 26 (9%) drop out at 6-month follow-up.

Funding	This research was supported by the Centers for Disease Control and Prevention (grant R30 CCR219136).
Study limitations	Confusion between how the methods describe the statistical analysis and the information in the participant flow chart. The methods state that intention to treat analyses were conducted, but the participant flow chart shows that not all participants randomised were included in the primary analyses.

Characteristics

Arm-level characteristics

	Patient referral (N = 304)	**Control (N = 296)**
Age, mean (SD)	25.1 (6.9)	24.9 (6.5)
Gender, female	n = 122 ; % = 40	n = 124 ; % = 42
≥2 sexual partners, past 3 months	n = 164 ; % = 54	n = 162; % = 55
Ethnicity		
African American	n = 116 ; % = 38	n = 124 ; % = 42
Afro-Caribbean	n = 167 ; % = 55	n = 148 ; % = 50
Hispanic	n = 27 ; % = 9	n = 36 ; % = 12
Other	n = 22 ; % = 7	n = 24 ; % = 8
Received provider advice to notify sexual partners prior to study activities	n = 286 ; % = 94	n = 269 ; % = 91
Presented to clinic with STI symptoms of		
Chlamydia	n = 128 ; % = 42	n = 154 ; % = 52

	Patient referral (N = 304)	Control (N = 296)
Gonorrhoeae	n = 131 ; % = 43	n = 104 ; % = 35
Both	n = 46 ; % = 15	n = 38 ; % = 13

TIDieR Checklist

Study arms

Patient referral (N = 304)

Brief name	n/a
Rationale/theory/Goal	The theory of reasoned action and social cognitive theory guided the intervention activities. Equipping people with knowledge on the benefits of partner notification would motivate them to let sexual partners know when they've been diagnosed with an STI. In addition, showing them how best to relay this to their partners would lead to less reinfection and safer sexual practices in future.
Materials used	2 sessions with health advisors. Written pamphlet on partner notification. Referral slips to give to partners.
Procedures used	The first session with the health advisor was in clinic at the time of a STI diagnosis. This included one-on-one counselling on behaviours that may have put him or her at risk for STI, identifying partners to notify, developing a notification plan, role-playing exercises, completing a signed contract to notify partners according to the plan. The written pamphlet summarised steps to successful sexual partner notification. Referral slips included information on where to access free, confidential STI testing and treatment. The second session could take place by phone or in person 4 weeks after the initial session (anywhere between 2-10 weeks). Activities included a progress review and discussing any remaining barriers to notifying partners. All procedures in the standard of care arm were all followed in the intervention arm.
Provider	The intervention was reviewed by members of the program's Community Advisory Group. Training for health advisors was conducted by a disease intervention specialist at New York City Department of Health.

Method of delivery	Person-to-person, either in person or over the phone.
Setting/location of intervention	STI clinic.
Intensity/duration of the intervention	2 sessions, 2-10 weeks apart. Follow-up until 6 months.
Tailoring/adaptation	Participants work with the health advisor to form their own partner notification plan.
Unforeseen modifications	None reported; not likely.
Planned treatment fidelity	Not reported.
Actual treatment fidelity	94% completed the 2 sessions.

Standard of care (N = 296)

Materials used	Referral slips. Health educator.
Procedures used	Referral slips were provided so participants could give them to partners. After the participant was enrolled, they could ask the health educator any questions about the clinic visit, diagnosis, treatment, or prevention. The health educator themselves gave the slips to the person.
Setting/location of intervention	STI clinic.
Intensity/duration of the intervention	1 session during the participant's visit to the STI clinic.

Tailoring/adaptation	None.
Unforeseen modifications	Not reported; not likely.
Planned treatment fidelity	Not reported.
Actual treatment fidelity	96% completed the intervention and reported to follow-up at 1 month.

Outcomes

Study timepoints	1 (month) and 6 months

Sexual partner notification outcomes at follow-up by intervention group and gender

	Patient referral	**Control**
	N = 287	N = 285
Notified 1 or more partners (1-month follow-up) *Polarity: Higher values are better*	n = 264 ; % = 92	n = 245 ; % = 86
Unprotected intercourse (6-month follow-up) *Polarity: Lower values are better*	n = 136 ; % = 52	n = 166 ; % = 62
Gonorrhoeae or chlamydia infection (6-month follow-up) *Polarity: Lower values are better*	n = 16 ; % = 6	n = 29 ; % = 11

Section	Question	Answer
Domain 1: Bias arising from the randomisation process	Low	Allocation sequence was random and identification numbers were preassigned to groups using these numbers. Participants were assigned sequentially as they enrolled in the study. Appropriate analyses showed no baseline imbalances.
Domain 2a: Risk of bias due to deviations from the intended interventions (effect of assignment to intervention)	Low	Not possible to blind but no deviations from intended intervention and intention to treat analyses used.
Domain 2b: Risk of bias due to deviations from the intended interventions (effect of adhering to intervention)	Low	Not possible to blind but co-interventions balanced across groups and not possible to crossover.
Domain 3. Bias due to missing outcome data	Low	Attrition at 10%
Domain 4. Bias in measurement of the outcome	Some concerns	Measurement of outcome appropriate and same between groups. However, outcomes were self-reported by participants face-to-face with health advisors who knew assignment of intervention. Possibility that outcome measurement could have been affected by lack of blinding of assessors.
Domain 5. Bias in selection of the reported result	Some concerns	No trial registration
Overall bias and Directness	Some concerns	for measurement of outcome, and in selection of the reported result
	Overall Directness	Directly applicable

D.2 Qualitative public health evidence

Cavalcante, 2016

Bibliographic Reference	Cavalcante, Elani Graca Ferreira; Miranda, Mahara Coelho Crisostomo; Carvalho, Ana Zaiz Flores Hormain Teixeira de; Lima, Ivana Cristina Vieira de; Galvao, Marli Teresinha Gimeniz; Partner notification for sexually transmitted infections and perception of notified partners.; Revista da Escola de Enfermagem da U S P; 2016; vol. 50 (no. 3); 450-7

Study Characteristics

Study type	Semi structured interviews
Aim of study	To learn the perceptions of patients with STIs and sex partners who are notified of the infection.
Study location	Brazil
Study setting	4 healthcare centres
Study methods	Participants presenting to the healthcare centres for STI services were recruited by purposive sampling, in which participants were recruited after providing information to a healthcare professional delivering care in the centres. Participants were invited if they had an STI and fulfilled the study criteria. The study used data saturation and repetition of testimonial information and did not study the people in pairs (index patients and notified partners) but as individuals. Semi-structured interviews were conducted by a trained investigator and collected data on gender, age, schooling, occupation and diagnosis of index patient. 2 guiding questions were used: What made you invite your sexual partner to go to a healthcare centre? How did you notify your partner of the need to go to a healthcare centre? And the following guiding questions were made to sexual partners: How did you feel when you were notified/ invited to go to a healthcare centre? What made you accept this invitation? Interviews lasted 20 mins and were fully transcribed and analysed using the collective subjective discourse (CSD) technique. This allowed data to be organised and tabled using the excerpts of speech most representative of the content. Analysis involved 6 phases: 1) Full transcription of answers from each subject; 2) Identification of key expressions, central ideas and anchors in each answer; 3) Descriptions of the central idea and anchors extracted from the key expressions, placing them in the corresponding column; 4) Grouping of central ideas with common meanings, assigning a letter to each group; 5) Creation of a summarized central ideal for each group; 6) CSD construction based on the summarised central idea.
Population	People recently diagnosed with an STI and their sex partners.
Study dates	March to July 2014
Sources of funding	Not reported.

Inclusion Criteria	**Criteria 1** People diagnosed with STIs or syndromes associated with STIs willing to notify partners **Criteria 2** Sexual partners notified by index patients or health professionals and how had gone to healthcare centres for testing or counselling
Sample characteristics	**Sample size** 11 index patients; 10 notified partners **Mean age (SD)** Index patients: 20 to 29 years old; partners: 20 to 48 years old **Characteristic 1** Index patients: 5/11 were men; partners: 5/10 were men. **Characteristic 2** Index patients: 4 had HIV; 4 had syphilis; 1 had HIV and syphilis coinfection; 1 had male urethritis associated with gonorrhoea/chlamydia infection; 1 had genital warts associated with HPV. Partners: 6 were notified of possible HIV infection; in addition, syphilis, genital warts and male urethritis were predominant. **Characteristic 3** Most index patients had a stable partner of less than 12 months; 6 partners were married and 4 were single. **Characteristic 4** Most index patients were heterosexual; 7 partners were heterosexual and 3 were homosexual
Relevant themes	What made you invite your sexual partner to go to a healthcare centre? **Theme 1: Mutual support** Participants thought it was important for themselves and their partners to be treated and that it was their responsibility to keep their partner informed **Theme 2: Concern about the partner** Participants were worried about the health of their partners **Theme 3: Relationship preservation** Participants thought that notifying would allow them to move on in their relationship **Theme 4: Resentment in relation to the partner** Participants who assumed that their partner had been unfaithful did not want to tell partners out of resentment How did you notify your partner of the need to go to a healthcare centre?

Theme 5: Verbal contact about the notification
Some participants told their partners in person

Theme 6: Telephone communication
Some participants told their partners over the phone

Theme 7: Notification delivery card
Some participants gave their partners a notification card without saying anything else

How did you feel when you were notified/invited to go to a healthcare centre?

Theme 8: Tranquillity
Some partners were calm when notified as they knew there was a treatment and felt their partner cared enough about them to help with their treatment

Theme 9: Negative feelings
Some partners felt anxious, sad and powerless because they could have avoided the risk

Theme 10: Consideration about the possibility of death and incurability
Some partners thought about death because they thought they may have had an untreatable disease

Theme 11: Fear of prejudice and difficult support
Some partners were worried about the negative reactions of family and friends, but expected good support from healthcare professionals

Theme 12: Betrayal and changes in the relationship
Some partners felt betrayed as their partner had clearly been unfaithful and that their relationship would change

What made you accept this invitation?

Theme 13: Fear of being ill
Partners accepted the invitation to come to clinic for fear of being ill

Theme 14: Attenuation of guilt related to infection transmission
Participants wanted to get tested to know if they had transmitted the infection to their partners to support them

Theme 15: Need to confirm the diagnosis
Partners wanted to know their own status since their partners were positive

Theme 16: Early start of treatment

	Participants wanted to be tested and treated as soon as possible

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?	Can't tell
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 directness	Overall risk of bias	Low
	Directness	Directly applicable

Section	Question	Answer
Coleman, 2007		
Bibliographic Reference	Coleman, Claire; Lohan, Maria; Sexually acquired infections: do lay experiences of partner notification challenge practice?.; Journal of advanced nursing; 2007; vol. 58 (no. 1); 35-43	

Study Characteristics

Study type	Semi structured interviews
Aim of study	To explore experiences of partner notification for syphilis from the perspectives of gay, bisexual and other MSM.
Study location	Greater Dublin Area, Ireland
Study setting	2 GUM clinics, variety of gay social venues, including 2 bars, 2 clubs and a sauna. Interviews were conducted in the middle of a syphilis outbreak.
Study methods	Information on the study was given to all who attended the clinical sites from December 2002. Recruitment was conducted by a purposive sampling method. Selected participants were approached on a return visit to arrange an interview. Written consent for interview was obtained before the interview started. Participants from the gay venues component of the study were recruited by CC at a time when blood-testing for syphilis was being offered in these venues. Selected participants were then chosen as the clinical participants. Interviews conducted in a university or clinical setting and lasted 45 to 90 minutes. Open-ended questions were used to explore attitudes and experience of PN: Why did you decide to attend an STI clinic? Have you ever attended an STI clinic in the past? How did you decide to inform your contacts? What did it feel like to be informed? Broader attitudes to partner notification? Do you think the process of partner notification is acceptable to you and your sexual contacts? Do you think contacts should be informed by partner notification? Interviews were transcribed verbatim, re-checked for accuracy and read repeatedly. NUD*IST was used for a systematic thematic analysis of the interviews. Interviews were coded line-by-line and then reviewers discussed the appropriateness of the codes. Sections from interviews were to sections of other interviews that covered similar issues or experiences. These then grouped into themes through abductive reasoning allowing iterative analysis between themes and existing research.
Population	MSM who had recently been diagnosed with syphilis, their contacts, or MSM from gay venues. The study wanted to capture the views of non-clinical participants as well as clinical participants.

	Sampling was conducted to include variation in social class, age and urban-rural background. There was no representation from ethnic minorities as the area is largely ethnically homogenous (White/White Irish).
Study dates	December 2002 to February 2004
Sources of funding	Obtained from the Health Research Board Ireland.
Inclusion Criteria	None reported
Exclusion criteria	None reported
Sample characteristics	**Sample size** 40 **Age** 20-35, n=19; 36-50, n=16; Over 51, n=5 **Characteristic 1** 5/10 from gay venues had never attended a GUM clinic **Characteristic 2** 15 were index patients; 15 were partners; 10 were non-patients **Characteristic 3** Men were mixed in terms of social class: employment type – professional or higher managerial, n=12; other non-manual, n=10; skilled manual, n=12; student/unemployed, n=6 **Characteristic 4** Men were from urban and rural backgrounds
Relevant themes	Theme 1 **Tracing** Participants felt that they had a public health duty to try their best to trace partners when they may be at risk. Acceptability of partner notification was mediated by a desire for sexual pleasure and for casual and anonymous sex. Some participants rejected tracing as they did feel like it was their duty to do so. Theme 2 **Informing about exposure** Participants were apprehensive about telling, but believed it was a lesser evil than not informing. Most participants found the act of notifying stressful, especially when they were stressed about their own diagnosis. Participants said that healthcare professionals receive

	training to break bad news, but they do not to do the same. One participant found the act of notifying easy and not stressful. Participants in long-term and monogamous relationships were concerned about the unpredictable effect notifying would have on their relationship and some were concerned about violent reactions. Participants were concerned that notifying may expose their STI status to the MSM community, or they may have to expose their sexuality to their wives before notifying them of risk. Some partners felt powerless, left alone and distant from the situation when notified by patient referral. Theme 3 **Invitations to clinics** Partners knew they may be at risk of an STI but being notified hastened the inevitable trip to the clinic, but some felt "dirty" attending clinic. Participants spoke about the double stigma of being gay and being seen as having an STI when arriving at clinic. Disruption to long-term relationships for MSM who are in both heterosexual and homosexual relationships can prevent clinic attendance

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

Section	Question	Answer
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 directness	Overall risk of bias	Low
	Directness	Directly applicable *(Study talks more generally about the acceptability of partner notification, but does include different methods of notification)*

Contesse, 2019

Bibliographic Reference	Contesse, Marielle Goyette; Fredericksen, Rob J; Wohlfeiler, Dan; Hecht, Jen; Kachur, Rachel; Strona, F V; Katz, David A; Attitudes About the Use of Geosocial Networking Applications for HIV/STD Partner Notification: A Qualitative Study.; AIDS education and prevention : official publication of the International Society for AIDS Education; 2019; vol. 31 (no. 3); 273-285

Study Characteristics

Study type	Focus Groups
Aim of study	To get the views from MSM who meet sex partners through geosocial networking (GSN) apps on their perspectives regarding using these apps for partner notification
Study location	USA
Study setting	Online focus groups
Study methods	Recruitment was done through banner advertisements on Facebook and Instagram, restricted by gender and age. The strategy used was designed to reach racially/ethnically and geographically diverse MSM in a purposive sampling approach. The social media platforms were chosen because they include people who do not use GSN apps as well as those who do, which avoided oversampling of GSN users. After clicking on the advert, the potential participants were diverted to an eligibility screener. An age cut-off of 35 was used

	because the researchers believed there would be a difference in attitudes towards using technology generally and for partner notification above this age. Participants with and without a history of HIV/STIs were recruited to provide different perspectives on partner notification. 4 online focus groups were conducted to assess how MSM meet and communicate with sex partners through GSN apps, attitudes towards partner services (PS) and perspectives on strategies for HIV/STD partner notification and health services through the apps. Each focus group consisted of 6-8 men, was semi-structured and lasted 90 mins. 3 facilitators conducted the focus groups on Zoom Meeting. The following topics were covered: (1) how MSM use GSN apps, including to meet potential partners, (2) how MSM communicate with potential partners in the apps, and their attitudes and beliefs about (3) notifying sex partners about an HIV/STD diagnosis, (4) strategies for notifying partners of potential exposure to HIV/STD through the apps, (5) a health department presence on the apps, and (6) HIV/STD health services offered through the apps. Facilitators asked participants to share their attitudes around hypothetically having to notify a partner and be notified by a partner about exposure to HIV/STD through each of the following three app-based methods: Method 1. Partner services staff offers to notify index patient's partners using a health department profile on the app while keeping the index patient's identity anonymous. Method 2. Partner services staff offers to coach the index patient in how to tell sex partners about the exposure through the index patient's own app profile. Method 3. The app has a feature that allows the index patient to anonymously send a message in the app to notify any user about possible HIV/STD exposure. Data saturation was considered after 4 focus group when there were no new emergent themes. All statements were extracted and matched to each area of enquiry. 2 coders each produced a summarising sentence for each topic area and assessed differences in responses between groups. A third coder assessed the sentences for agreement. Disagreements were discussed between all coders until agreement. Participants received $60 gift certificate
Population	A diverse population was chosen in terms of HIV/STI status, age and race. Participants were chosen because they used GSN apps to find sex partners. Focus groups were stratified based on age, history and diagnosis with HIV, syphilis, gonorrhoeae, chlamydia into 4 groups: (1) aged < 35 with a history of HIV/STD, (2) aged ≥ 35 with a history of HIV/STD, (3) aged < 35 with no history of HIV/STD, and (4) aged ≥ 35 with no history of HIV/STD.
Study dates	February and March 2017
Sources of funding	Supported by the National Coalition of STD Directors with unrestricted grant funding from Gilead Sciences, Inc. Gilead Sciences, Inc. has had no input into the development or content of this research.
Inclusion Criteria	Criteria 1: Men who use GSN to meet sex partners

	Criteria 2: Cisgender MSM over 18 years old Criteria 3: Resident of USA
Exclusion criteria	None reported
Sample characteristics	**Sample size** 28 **Reason for stopping recruitment** Data saturation **Mean age (SD)** 31 (IQR: 21 to 50) **Characteristic 1** Ethnicity: 39% Non-hispanic white; 46% lived in South USA **Characteristic 2** STI status: 50% ever diagnosed with HIV syphilis, gonorrhoea or chlamydia
Relevant themes	**Theme 1: Communication through GSN apps** Not giving away many personal details or blocking partners after meeting Many participants did this to protect their safety, to add to the sexual experience, or because they did not want to speak to them again **Theme 2: General attitudes to partner notification** Responsibility to tell partners Participants that they felt responsible in telling partners about potential infection regardless of the relationship they had with partners or they infection they may have transmitted. Safety or stigma may mean people are happier to use provider referral. Some participants said that provider referral was cowardly but acceptable if people's safety (closeted/anonymity required) was at risk. The manner of notification and preferences differed but ultimately all men wanted to know about an exposure. Mixed feelings regarding 'Provider referral' but some outlined that it would also allow them (the partner notified) to potentially ask health-related questions. Some participants in small communities were afraid that the healthcare professionals would know who they were exposing them. Partners expressed that they would want to know about exposure to infection regardless of the notification method and preferred it over not knowing. **Theme 3: Partner notification through partner services staff in GSN apps.** Declining using GSN (method 1) to tell people themselves when partner services staff offered to notify partners using a health department profile

	Method 2 (having a partner services staff member from their local health department coach them on what to say when sending a notification message on their own through the app) - Men had mixed feelings about the coaching offer. Some participants liked the idea of health department notification in an app, others felt that they would question the authenticity of the health department profile and worry about the confidentiality of the messages, suspected malicious intent; despite scepticism the consensus was that participants would get tested if they received a message in the app from the health department about being exposed to HIV or another STD. Participants would rather notify partners in person rather than a health department via an app because it felt cold an impersonal, but this depended on how close they were with the partner: the more casual the partner, the more acceptable it was to notify via proxy. Coaching on sending notification messages: mixed views Some participants thought that coaching would help them cope and know what to say; other participants thought this was unnecessary and would rather approach the situation their own way. Responsibility to get tested if received a message via health department profile on app Partners felt a responsibility to get tested if they were notified this way. Participants thought the presence of a health department on the app would increase credibility and allow people to access reliable health information; some participants were worried about intrusion, exposure in the community and fake profiles being set up to scare people **Theme 4: Partner notification using an anonymous messaging system (method 3)** Most participants said they would prefer to notify partner directly, some said they would use the anonymous feature on the app, some said they'd like to customise the message but it was raised that this could be used for malicious purposes. These participants liked that they could contact partners if they did not have contact information for them or if they had a large number of partners from the app. Some liked that there was an option to notify partners without healthcare professional involvement. Some said that being anonymous may help people to come forward and tell people about their risk. Partners said they were open to receiving anonymous notification and some would be grateful to receive notification anonymously. Participants said it would not deter them from using an app or change the way they use an app with an inbuilt partner notification feature. **Theme 5: Health department profiles on GSN apps** Most participants liked the idea of these profiles on the apps as they were a reliable source of information for people. Some indicated that they would appreciate information on HIV/STD testing, referrals to health care providers and counselling; Some participants from rural communities did not like that in small communities healthcare professionals may know them thus exposing their sexuality. Participants wanted the healthcare professionals on these apps to have experience working with MSM and the issues affecting their community. Participants wanted profiles to be easily verifiable so they would have confidence in the profile and that they would not be fake profiles (e.g. Twitter blue tick). Participants wanted contact information for staff. **Theme 6: HIV/STI health services offered through GSN apps** Most participants wanted apps to let know about HIV/STI outbreaks in their area to remind them to get tested.

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 directness	Overall risk of bias	Low
	Directness	Directly applicable

Goyette, 2016

Bibliographic Reference	Goyette, Marielle; Wamuti, Beatrice Muthoni; Owuor, Mercy; Bukusi, David; Maingi, Peter Mutiti; Otieno, Felix Abuna; Cherutich, Peter; Ng'ang'a, Anne; Farquhar, Carey; Understanding Barriers to Scaling Up HIV-Assisted Partner Services in Kenya.; AIDS patient care and STDs; 2016; vol. 30 (no. 11); 506-511

Study Characteristics

Study type	Focus Groups Semi structured interviews
Aim of study	To explore barriers to implementing assisted partner services (APS) from the point of view of client, community and the health system.
Study location	Kenya
Study setting	Health facilities offering APS through a cRCT.
Study methods	Data was obtained through in-depth interviews (IDIs) and focus group discussions (FGDs). Subjects who declined enrolment in the study were purposively selected using quota selection, stratifying on HIV testing site and gender. To get a balanced sample between urban and rural, people from Nairobi and Kisumu counties were selected. Focus group included 3 categories of people: health advisors testing for HIV and counselling (HTC) counsellors trained in PN and involved in the APS study; HTC counsellors not involved in the study; and walk-in clients accessing HTC services. Interviews were semi-structured. Interviews and focus groups were recorded. English transcripts were analysed by 2 coders. A start list of themes hypothesised to be influential was created before analysis began. Both coders read through all of the transcripts independently and added additional salient themes to the code list using open coding. The analyst compiled the two code lists to create a master codebook, and the two coders discussed the codebook to come to an agreement about each code. Both coders independently coded the data. The analyst used ATLAS.ti, version 7.5.9 (Berlin, Germany), and the interviewer used Microsoft Word and Excel. The analyst compared all coded transcripts, and the analyst and interviewer resolved any conflicts in coding. After coding, the two coders selected quotes that best represented each theme and subtheme. The quotes that were selected by both coders were included as representative.
Population	People who declined enrolment in the APS cRCT who were newly diagnosed with HIV.
Study dates	2015
Sources of funding	Not reported.
Inclusion Criteria	**Criteria 1** >18 years old **Criteria 2** Newly diagnosed as being HIV positive

Sample characteristics	**Sample size** 20 (in depth interviews); 9 focus groups consisted of walk-in clients accessing HTC services, health advisors who are HIV testing and counsellors involved in the APS study, and HTC counsellors not involved in the APS study. **Median age (range)** 40 (30 to 47)
Relevant themes	**Theme 1: State of mind after receiving an HIV-positive result -** affected his or her decision to accept APS in that moment; Participants were shocked and needed time to process their results before embarking on APS **Theme 2: Trust between client and HTC counsellor** – relationship was a barrier or facilitator When counsellors showed empathy to people, they were more likely to accept their results; strong rapport impacted participation; rapport enhanced if the same counsellor tests, enrols, and elicits partners; some participants did not take part in the larger APS trial because they did not trust their counsellor, some were worried about confidentiality **Theme 3: Fear of stigma** Participants were worried that exposure would mean isolation, losing work and being the subject of gossip **Theme 4: Fear of creating conflict in relationship(s)** Participants feared violence from partners, fear of dissolution of the relationship, losing financial support and for being blamed for bringing HIV into the relationship **Theme 5: Type of relationship** Participants were more confident telling partners if they were in stable and a non-abusive relationship than people in abusive relationships who feared unpredictable reactions. Participants felt varying levels of responsibility depending on the type of relationship varying from having to tell long-term partners to no responsibility over one-time partners Breach of confidentiality: they know they are their partners only partner **Theme 6: Alternative methods of notification** Some participants felt that bringing their partner to clinic and pretending it was their first time learning their results would prevent conflict; some participants wanted to tell their partners about their positive diagnosis before the partner went to clinic **Theme 7: Community awareness about APS** Lack of understanding of APS was a barrier to implementation; A lack of familiarity makes clients not want to provide partner information.

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 directness	Overall risk of bias	Low
	Directness	Partially applicable (*population is people recently diagnosed with HIV from a non-OECD with a different healthcare system and different views around sex and partner notification)*

Section	Question	Answer
Hershow, 2019		
Bibliographic Reference	Hershow, R.B.; Zimba, C.C.; Mweemba, O.; Chibwe, K.F.; Phanga, T.; Dunda, W.; Matenga, T.; Mutale, W.; Chi, B.H.; Rosenberg, N.E.; Maman, S.; Perspectives on HIV partner notification, partner HIV self-testing and partner home-based HIV testing by pregnant and postpartum women in antenatal settings: a qualitative analysis in Malawi and Zambia; Journal of the International AIDS Society; 2019; vol. 22 (no. s3); e25293	
Study Characteristics		
Study type	Semi structured interviews	
Aim of study	To assess the perceived acceptability and preferences of 3 different male partner HIV testing modalities and the perceived acceptability of a choice-based approach for male partner HIV testing in antenatal settings among a range of stakeholders.	
Study location	Lilongwe, Malawi and Lusaka, Zambia.	
Study setting	Hospital antenatal and maternity clinics; 2 sites in Malawi and 1 in Zambia.	
Study methods	Recruitment was done in clinics in a purposive sampling approach. Pregnant/postpartum women recruited into the study were also asked to invite their male partners to participate. Semi-structured, in-depth interviews were conducted using interview guides tailored to participant type. They were conducted in private rooms by trained interviewers lasting approximately 60 minutes. Participants provided written informed consent before participation. Interviews were tailored to participant type. They covered strategies to improve HIV prevention, care and treatment services. The analysis covered in this publication is male partner HIV testing modalities. Each modality was described consistently to all participants before asking their views: 1) The description of partner notification was that male partners would receive a letter from the clinic informing them of their HIV risk and inviting them to the clinic for HIV testing; if a male partner did not visit, the clinic staff would call him to encourage testing. 2) The description of homebased HIV testing was that community health workers would visit the home to offer HIV testing to male partners. 3) The description of secondary distribution of HIV self-test kits was that women would be provided with the HIV self-test kits and training on how to use them; then, the women would distribute the HIV self-test kits to their male partners. For all approaches, interviewers emphasized that the woman's consent would be required before approaching her male partner. The interviewer corrected misunderstandings. All participants received a small transport allowance.	

	Audio recordings were translated and transcribed into English. A central codebook was developed between each country. Coding was conducted by country-specific teams in NVivo12. To assess consistency, both coding teams coded the same transcripts, discussed differences and updated the codebook accordingly. Summaries were written for each country to assess overarching patterns in views on each male partner testing approach. Matrices were developed to systematically compare relevant responses across participants and countries.
Population	Pregnant and postpartum women, their partners, and maternity-related healthcare workers who provide HIV prevention services, and policymakers. To be consistent with this review's protocol, themes extracted only contain the views of the pregnant and postpartum women and their partners.
Study dates	June 2017 to May 2018
Sources of funding	This work was funded by an award from the U.S. National Institutes of Health (R01 AI131060).
Inclusion Criteria	**Criteria 1:** Pregnant or post-partum women with known HIV status (positive or negative) **Criteria 2:** Their partners with known or unknown HIV status (positive or negative) **Criteria 3:** Healthcare workers who work in HIV prevention
Sample characteristics	**Mean age (SD)** HIV-positive women, 29; their partners, 37; HIV-negative women 26; their partners, 31. **Pregnant/postpartum women** N=80, 40 each from Zambia and Malawi; HIV-positive, n=41 **Male partners** N=28, 15 from Malawi, 13 from Zambia; female partner HIV-positive, n=14. All male partners had previously been tested for HIV.
Relevant themes	**All the themes below contain views from pregnant/postpartum women (named as "participants" below) and their male partners only.** **Theme 1**: **Views on HIV partner notification** Acceptance of PN through letter Viability (for partners) linked to partner support Partners found the letter motivating because they would take the health service seriously; participants liked the letter as they could explain before handing over the letter Fear of sending letters Some participants felt that their partners would suspect them of being involved in sending the letter and feel that their privacy was violated; some participants said that letters can phone calls could be evaded

	Some HIV-negative women in Malawi pointed out that the female partner's HIV status may influence the male partner's response. Women's HIV status was considered by a few people to influence likelihood of testing in men (HIV positive partner = more likely to test; HIV negative partner = requesting a test could possibly cause offense) **Theme 2: Views on home-based HIV testing** Most participants and partners thought home-based testing was convenient, acceptable, would save time and money, would allow them to receive counselling and showed that healthcare workers cared about them Difficult to schedule home visits due to work or confidentiality Some participants said it may be difficult to schedule home visits because partners would be at work, they may offend partners or would expose them to the community of potentially being HIV-positive **Theme 3: Views on secondary distribution of HIV self-testing kits** Most participants and partners thought home testing kits were acceptable, convenient, confidential Participants liked home testing as it allowed them to facilitate the process and ensure testing Confidentiality was a concern with concerns regarding potential stigma and discrimination arising from the 'home visit' Difficulty in using the tests Some participants said that there may be problems with home testing kits because of a lack of training, lack of professional counselling, partners would not trust participants to administer/reading/reporting the test correctly, and that there was no direct link to treatment Some concern that men would associate female partner's request for HIV self-test kits with distrust or suspicions of promiscuous behaviour **Theme 4: Most preferred male partner testing modality** Male partners were split in their preferences for the 3 testing modalities. There was a difference in preference between HIV-positive and -negative women: • most HIV-positive women selected patient referral and secondary distribution of testing kits because of concerns around stigma and confidentiality. • Most HIV-negative women in Malawi selected patient referral and home-based testing because of concerns around false or misinterpreted results and lack of counselling with secondary distribution of testing kits. Less than half of pregnant/postpartum women and their partners chose the same modality. **Theme 5: Views on choice-based approach was not extracted because data included in this theme only represented views of healthcare professionals.**

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

Section	Question	Answer
Overall risk of bias and directness	Overall risk of bias	Low
	Directness	Partially applicable (*population is people from non-OECD countries with different healthcare systems and potentially different views to sex and partner notification; some of women and partners were chosen because they were not HIV positive but women in these countries were encouraged to get their partners tested in case they had recently contracted HIV and prevent onward transmission to the mother and possibly the baby)*

Hopkins, 2010

Bibliographic Reference	Hopkins, Carol A; Temple-Smith, Meredith J; Fairley, Christopher K; Pavlin, Natasha L; Tomnay, Jane E; Parker, Rhian M; Bowden, Frank J; Russell, Darren B; Hocking, Jane S; Chen, Marcus Y; Telling partners about chlamydia: how acceptable are the new technologies?.; BMC infectious diseases; 2010; vol. 10; 58

Study Characteristics

Study type	Semi structured interviews
Aim of study	To determine methods used by participants to contact their partners, the reasons for choosing them, and their opinions of various partner notification methods including new technologies.
Study location	Australia
Study setting	3 urban sexual health centres and 2 rural GPs.
Study methods	Semi-structured telephone interviews were conducted with people recently diagnosed with chlamydia. Agreement to be a part of the study was obtained when people attended clinic. They were called by a research nurse to obtain consent and conduct a 30- to 40-minute interview with them. The interviews explored many topics regarding PN, but this publication only focuses on discussion relating to methods of PN. The interviews were audio-taped, transcribed and coded for emerging themes using NVIVO (V7.0), a qualitative research software program. The coding was conducted independently by two researchers and then discussed to achieve consensus on common themes.
Population	People recently diagnosed with chlamydia

Study dates	November 2006 to May 2007
Exclusion criteria	**Criteria 1:** Did not speak English **Criteria 2:** >18 years old **Criteria 3:** Already been told by a partner that they were at risk of chlamydia
Sample characteristics	**Sample size** 40; 38 from sexual health centres and 2 from GPs. **Age range** 18 to 55 (65% were 18-25 years old) **Characteristic 1** 25 females; 35 heterosexual; 4 MSM; range of sexual partners in previous 6 months: 1-40
Relevant themes	**Theme 1: Methods used to tell partners about chlamydia** Participants chose to notify partners in person or over the phone most often. A minority used SMS, email and provider referral **Theme 2: Reasons for choosing methods** Participants thought that face-to-face was the best way to notify someone of a personal issue such as STI risk because it is the most appropriate, allowed 'them' to see partners reaction, was considered to demonstrate respect and consideration, the topic deserves a conversation and to allow them to provide support to the partner. Participants who rang their partners did so because it was the quickest way, and when Infidelity was an issue allowed notification to be 'got out the way'. Use of phone, e-mail, SMS allowed avoidance of direct contact when this was an issue – often fear of reaction was an issue Email was used when partners were overseas and SMS when partners were not answering phones. SMS was used to request partner to call them and then news of chlamydia could be discussed Participants felt that any written communication could be shown to others, which was undesirable **Theme 3: Opinions of contact methods** Participants made a distinction between more personal and traditional methods of contact such as face-to-face and phone, and less personal newer forms of communication such as email and SMS. Participants believed that notifying someone of a possible STI infection deserved a more personal form of communication. SMS and email were acceptable in certain circumstances (explored below); participants felt it was better to tell people in a poor way than not at all **Theme 4: Face-to-face** Participants felt that notifying partners face-to-face demonstrated respect, caring and consideration for their partners; it allowed participants to provide support; most participants said that they felt nervous and the process was stressful and embarrassing. Some

	participants feared angry or derogatory actions from their partners when they told them. Interviewees felt partners would think more of them and it would allow them to observe participant reaction **Theme 5: Phone** Phone was seen as the next most acceptable form of notifying as it was quick but still personal. Some participants said that it gave them control over a potentially confrontational conversation and was less risky, confronting and embarrassing, but did not allow them to support their partner adequately and could be expensive **Theme 6: Email** Participants thought email was not an acceptable method to deliver sensitive news because it was rude and distant, but could work if people were no longer in contact or lived far away from each other; it can also be written in a calm way. Negatives outweighed the positives; Participants were concerned about confidentiality because these messages could be shown to others. **Theme 7: SMS** Participants felt that SMS was less acceptable than email because the messages are so short and cold; some participants thought that it could be acceptable for one-time or superficial relationship. SMS allowed avoiding personal contact/shame; Participants were concerned about confidentiality because these messages could be shown to others; and concerns if SMS would be taken seriously by recipients. **Theme 8: Letters** Some participants thought that letters written by themselves were better than email or SMS because they were more personal and showed caring, but still should only be used if the relationships was not close, there was embarrassment attached to a possible discussion or had no other means of contact; some participants thought letters were old fashioned, time-consuming and a 'cop-out'; participants thought letters written by healthcare professionals carried weight and liked the anonymity, but especially if it was casual partners or when they feared violent reactions. Participants were concerned about confidentiality because these messages could be shown to others.

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?	Can't tell

Section	Question	Answer
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?	Can't tell
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 directness	Overall risk of bias	Low
	Directness	Directly applicable

Lessard, 2019

Bibliographic Reference	Lessard, D.; Aslan, A.; Zeggagh, J.; Morel, S.; Michels, D.; Lebouche, B.; Acceptability of a digital patient notification and linkage-to-care tool for French PrEPers (WeFLASH©): Key stakeholders' perspectives; International Journal of STD and AIDS; 2019; vol. 30 (no. 14); 1397-1407

Study Characteristics

Study type	Focus Groups Semi structured interviews

Aim of study	To obtain stakeholders' views on the acceptability of WeFLASH, a digital smartphone PN tool to be released to French HIV pre-exposure prophylaxis users.
Study location	Paris, Lyon and Nice, France.
Study setting	Community
Study methods	Convenience sampling was used for PrEPers and mediators who had experience of either taking PrEP for 3 months, or community mediators who had experience of PrEP follow-up for 3 months, respectively. Their views were captured by focus groups. Expert sampling was used to recruit physicians and decision-makers. Their views were captured through interviews. Recordings of the focus groups and interviews were transcribed. The analysis was focused on sections about the PN app. Transcriptions were coded and discussed with co-authors. The resulting scheme included perceived benefits of importance to stakeholders, risks and limitations and solutions to manage them. This was done in NVivo 11.0.
Population	PrEPers, community mediators, physicians and decision-makers. Views presented in the theme summaries below only represent those of the PrEPers.
Study dates	February to July 2018
Sources of funding	The authors received no financial support for the research, authorship, and/or publication of this article.
Inclusion Criteria	**Criteria 1** Using PrEP for >3 months
Exclusion criteria	None reported
Sample characteristics	**Sample size:** 21 **Mean age (SD):** 38 **Characteristic 1:** 38% reported 2 or more STIs in the previous 12 months **Characteristic 2:** 52% had >40 partners in the previous 12 months **Characteristic 3:** 19% reported using apps for information on STIs and PrEP
Relevant themes	**Potential benefits of WeFLASH!** **Theme 1: Improved patient notification and STI screening practices**

	Participants said that targeted screening by notifying people at risk of STI through the app was a good idea, especially as they currently felt that they couldn't notify enough partners. However, this may be due to sexual practices making it difficult to trace partners. The app could help notify anonymous partners **Theme 2: Transferrable data** Participants liked that the app could transfer real-time data to update them on local infection outbreaks, treatments and prevention campaigns **<u>Potential impacts, risks, and suggested solutions</u>** **Theme 3: Privacy and confidentiality** Participants raised possible issues with assessing the seriousness of detail-less, anonymous notifications. were concerned that the app could flash a notification on their phone and identify them as infected; they recommended the app be customisable to prevent push notifications exposing them **Theme 4: Sexual behaviour makes using the app difficult** Many participants' sexual behaviour and location for sex (sex parties, bathhouses) would not allow them to have their phone during sex and would make using it difficult; Some participants flagged that App use could be a filter for partner choice – indication of safe sexual practice or discrimination amongst MSM. Barrier to use: when and how to discuss with partners – before or after sex; concerns that discussion could disrupt relationships with intimate/committed partners (spontaneity; trust; STI stigma); making the app more 'fun' (animations, playful, game-like) and reassuring (language) could overcome barriers **Theme 5: Fairness of use** Participants highlighted the app as increasing accessibility for different communities to services; Some participants said that the app relied on people having a smartphone, which some people do not have, and potential linguistic barriers; some participants saw PrEPers who use the app as ambassadors of good sexual health who could spread the message of the app to non-PrEPers; some participants saw the app as a way of fairly or unfairly vetting people in an already exclusive community; Participants supported more inclusive use beyond 'PrEPers' to increase app benefits, decrease risk of judgement and rejection – but doubts expressed that it would reach all MSM

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

Section	Question	Answer
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 directness	Overall risk of bias	Low
	Directness	Directly applicable

Reed, 2015

Bibliographic Reference	Reed, Jennifer L; Huppert, Jill S; Gillespie, Gordon L; Taylor, Regina G; Holland, Carolyn K; Alessandrini, Evaline A; Kahn, Jessica A; Adolescent patient preferences surrounding partner notification and treatment for sexually transmitted infections.; Academic emergency medicine : official journal of the Society for Academic Emergency Medicine; 2015; vol. 22 (no. 1); 61-6

Study Characteristics

Study type	Semi structured interviews

Aim of study	To explore the barriers to and preferences for partner notification and treatment among adolescent males and females tested for STIs in an emergency (ED) setting and to explore the acceptability of ED personnel notifying their partners.
Study location	Cincinnati, USA
Study setting	One adult and one paediatric emergency department (ED) in an urban setting.
Study methods	Purposive sampling was used to recruit potential participants who presented to the ED with STI-related complaints. Semi-structured interviews were conducted by three trained interviewers. An interview guide was developed by a multidisciplinary team and was used to provide consistency and guide the interviews. Probing questions were used as needed based on participant responses. Key topics discussed included barriers and risks experienced when notifying a partner, barriers to partners seeking treatment, preferences for partner notification (phone call vs. text message vs. letter, etc.), suggestions for where and how their partner(s) would receive the appropriate treatment (i.e., ED vs. primary care provider vs. health department), and acceptability of a HCP contacting their partners. All interviews were audiotaped with participant permission, and audiotapes were transcribed by an independent transcriptionist. Transcripts and any notes taken were cleaned, edited, and imported into NVivo 9 software to organize themes and code direct quotations. The interview data were analysed using the five phases of framework analysis.11 In phase 1 (familiarization), the investigators (JR, RT, GG) independently read through the transcripts reaching consensus regarding recurrent themes and important ideas. In phase 2 (identification of a thematic framework), the authors collaborated to develop an organizational model for the themes. In phase 3 (indexing), the data were systematically labelled according to the thematic framework. In phase 4 (charting), direct quotations from the interviews were formulated into a master chart with headings and subheadings. All discrepancies were reviewed until consensus was reached. In phase 5 (mapping and interpretation), the investigators used any existing literature to identify potential linkages between concepts and mechanisms underlying adolescents' perceived barriers to and suggestions for partner notification and treatment.
Population	Adolescents and young adults (aged 14-21) attending the ED with STI-related complaints.
Study dates	Not reported.
Sources of funding	Funded by Cincinnati Hospital Research Foundation Place Outcomes Grant Award (Reed, PI); K12 BIRCWH (Building Interdisciplinary Research Careers in Women's Health) Award from the NICHD/NIH K12HD051953 (Tsevat, PI; Reed, Trainee).
Inclusion Criteria	**Criteria 1** Presenting to ED with STI-related complaints
Exclusion criteria	None reported
Sample characteristics	**Sample size:** 40 **Mean age (SD):** Median (range): 19 (14 to 21)

	Characteristic 1: Ethnicity: Black, n=30; White, n=6; Bi/multiracial, n=3**.**
Relevant themes	**Theme 1: Barriers to partner notification** Participants feared retaliation or loss of relationship, a lack of understanding/concern about the short/long term consequences of an STI; social stigma, violation of privacy and embarrassment when notifying partners **Theme 2: Perceived partner barriers to treatment** Participants were asked for reasons on why their partners may not receive treatment. They suggested a lack of understanding or concern of treatment regimens and the consequences associated with STIs prevented the pursuit of testing/treatment; lack of transportation to receive medical care, fear of positive test results and insufficient time. **Theme 3: Preferred methods of partner notification** Most participants preferred notifying partners in person or by calling. Some participants suggested using an online method of notification. Most participants said provider notification by calling was acceptable and some participants said SMS provider referral was acceptable. Responses showed that people found less personal forms of notification were more acceptable for casual partners than regular partners; HCP notification was considered acceptable with some (20%) preferred HCP notification by text messaging. **Theme 4: Perceived partner preferences for treatment** Participants perceived that partners would like to receive anonymous, convenient care that is easily accessible, focused, efficient and available outside of business hours. Most participants would likely access an onsite STI clinic at the Children's hospital for STI treatment but not those over 21 (adult can't access children's services). Some participants raised concerns about on-site STI clinics at a children's hospital because others would know why the partner was attending the clinic, breaching their confidentiality

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

Section	Question	Answer
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 directness	Overall risk of bias	Low
	Directness	Directly applicable (*note that the population includes a paediatric population aged 14-18)*

Tomnay, 2017

Bibliographic Reference	Tomnay, Jane E; Hulme-Chambers, Alana; Bilardi, Jade; Fairley, Christopher K; Huffam, Sarah; Chen, Marcus Y; A Qualitative Study of Means to Improve Partner Notification After an HIV Diagnosis Among Men Who Have Sex with Men in Australia.; AIDS patient care and STDs; 2017; vol. 31 (no. 6); 269-274

Study Characteristics

Study type	Semi structured interviews

Aim of study	To understand how PN is carried out by MSM recently diagnosed with HIV and to identify barriers and enablers of PN, including how many men met their partners and whether or not partners were traceable. It also explored whether and how future development of a website to assist HIV PN might be helpful.
Study location	Australia
Study setting	Sexual health services, tertiary hospital specialising in HIV clinical care and a GP with a high proportion of MSM patients.
Study methods	Interviews were semi-structured and conducted over the phone or in person. The interview schedule consisted primarily of questions about the participant's previous HIV testing; what PN advice had been provided by their health practitioner at the time of their HIV diagnosis; what contact information was available to the participant to contact recent partners; whether any PN was undertaken and, if so, who did it; how they felt about doing it; and the reaction of the partner. At the end of the interview, participants were shown 1 of 2 existing PN websites (www.testme.org.au or www.thedramadownunder.info) or were provided a description of the website and asked whether it would be helpful for HIV PN. After seven interviews were completed and transcribed, an interim analysis was undertaken. Interview transcripts were independently read and coded by all three researchers before they met to discuss and compare data coding and interpretation (cross-coding/multiple coding). Data were analysed using a combined deductive/inductive approach, whereby themes were derived from both previous literature, the research questions, and interview schedule and inductively from emergent and recurrent themes arising from the data. At this time, it was decided that two additional questions would be added to the interview schedule to allow for further exploration of some themes emerging from the data. The same cross-coding process was repeated for the remaining interviews. All interviews were digitally recorded and transcribed verbatim for thematic analysis and took on average of 60 min to complete.
Population	MSM recently diagnosed with HIV.
Study dates	Not reported.
Sources of funding	Not reported.
Inclusion Criteria	**Criteria 1** Diagnosed with HIV in the previous 12 months
Exclusion criteria	None reported
Sample characteristics	**Sample size:** 15 **Reason for stopping recruitment:** Data saturation

	Mean age (SD): Not reported
Relevant themes	**Theme 1:The fear of PN and HIV disclosure** Participants felt that partners should be notified wherever possible, but regular partners were more likely to be notified, and in-person because they were more likely to have contact details for them, and felt a greater sense of moral responsibility and emotional attachment to them. PN for casual partners was inconsistent, and largely influenced by the reasons and ways in which men met their casual partners – blocking and deleting contact details contributes to a lack of ability to contact. Participants preferred to use methods that retained their anonymity, such as provider referral, for casual partners. Participants were uncomfortable or unwilling to contact casual partners. Reasons for this included having deleted or never received contact information and fear of repercussions from casual partners, which lead to these men choosing methods that protected their anonymity – if a service did not provide anonymity they would not undertake PN for casual partners regardless of whether contact information was available. Many found PN difficult after their recent HIV diagnosis and were afraid of reactions. Participants said this 'fear' influenced their decision-making on which PN method to use. For regular partners, participants felt a moral responsibility to tell partners themselves. **Theme 2: Partners' unexpected reactions** Fear of notifying partners was based on the assumption of a negative reaction Participants expected partners to be annoyed or angry at them but most participants found that partners were supportive and that they were thinking of each other rather than themselves. Many were pleasantly surprised by the supportive responses from both casual and regular partners. PN process described as difficult to consider and carry out but better than expected when completed **Theme 3: The need for more patient support** Participants said that being a stressful time of their lives (recent HIV diagnosis, fear of partner reaction, disclosing HIV status, finding partners, managing medical appointments) made PN more difficult When other methods of PN that increased anonymity (websites, information on HIV and how to approach partners) most participants thought them useful resources for PN (in the absence of PN officers (PNO) and dealing with new HIV diagnosis Support and coaching relating to fear around partners' reactions, disclosing HIV status, trying to find partners was welcomed as participants were also trying to arrange many medical appointments and coming to terms with their own diagnosis

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 directness	Overall risk of bias	Low
	Directness	Directly applicable
Wood, 2018		
Bibliographic Reference	Wood, Julia M; Harries, Jane; Kalichman, Moira; Kalichman, Seth; Nkoko, Koena; Mathews, Catherine; Exploring motivation to notify and barriers to partner notification of sexually transmitted infections in South Africa: a qualitative study.; BMC public health; 2018; vol. 18 (no. 1); 980	

Study Characteristics

Study type	Semi structured interviews
Aim of study	To explore barriers to partner notification (PN) and their perceptions about effective PN strategies for people who have contracted STIs. This will assess the intervention's impact on participants' motivation and skills to notify their partners about their STI status.
Study location	South Africa
Study setting	Township with high STI and HIV prevalence.
Study methods	This was a sub-study of a 3-arm RCT where participants were allocated to 3 different counselling interventions of varying intensity. The interventions in these arms were based on the theory of Information Motivation Behavioural Skills model. These arms were offered one-on-one sessions including an enhanced standard of care group that received a 20 min STI and HIV education session, a group that received STI and HIV education as well as information regarding risk reduction, and an intervention group that received a 60 min educational and motivational enhanced session regarding STI and HIV education, risk mitigation, and effective PN strategies. People who had been diagnosed with an STI by a nurse were invited to take part in the study. The qualitative sub-study initially wanted to take a random sample of 30 recordings from the 60 mins enhanced counselling sessions. However, many of the recordings were cut short or featured a verbally unresponsive participant. To obtain a richer source of data, one of the authors reviewed each of the 230 session recordings to purposively select 30 based on unreserved verbal interaction between the interviewer and the participant. As the socioeconomic setting was already controlled for, the only other consideration to balance was male:female ratio (15 recordings each). The study's two counsellors were included via one-on-one interviews with the primary author; the purpose of these interviews was to triangulate participants' responses and to enhance analysis. The transcripts were manually coded; the primary author reviewed transcripts in their entirety, identified prominent themes, and coded and categorised the responses within those themes. Codes were derived from the data based on emergent themes and were eventually grouped under three major themes followed by sub-themes. In order to enhance rigour in analysis, the secondary authors reviewed and commented on the codes and theme categorisation.
Population	People from a township recently diagnosed with an STI.
Study dates	2014-2016
Sources of funding	This study was funded by the South African Medical Research Council.
Inclusion Criteria	**Criteria 1** >18 years

	Criteria 2 Living in the catchment area (an impoverished township in an urban South African setting)
Exclusion criteria	**Criteria 1** The known partner of an index patient or if they had tested positive for HIV during their current visit
Sample characteristics	**Sample size:** 30; 15 men and 15 women. **Mean age (SD):** 28.4 (19 to 41)
Relevant themes	**Theme 1: Motivations for notifying** Most participants were motivated to notify partners about possible transmission of an STI and for them to attend clinic. Males were less likely to notify casual and/or anonymous partners than regular partners. Females notified partners as a matter of practicality so they would not get re-infected. Most participants were most likely to notify partners in-person. Some males requested using a phone call or clinic intervention to make sure they did notify partners in-person, or because partners were in another province. Some women used phone calls or SMS for casual partners. Some wanted clinic intervention so the partner would take the in-person notification seriously. **Theme 2: Effect of HIV status on PN intentions** Concerns about HIV were a motivation for notification Many participants believed that their untreated STI would become HIV. Those expressing HIV positive status frequently raised concerns regarding staying healthy and protecting themselves Those expressing HIV negative status outlined that the fear of contracting HIV was a motivation for STI treatment and PN Many participants with HIV did not want to be re-infected with STIs because they were conscious of their health. These 2 reasons motivated participants to tell partners Significant social and structural barriers: health education, health system and interpersonal barriers **Theme 3: Health education barriers** Participants relied on beliefs on how they acquired the STI instead of trying to find the source, such as certain behaviour during sex or menstruation. Belief's about women as STI carriers, STI's self-generating, the result of poor hygiene, misperceptions on STI aetiology (witchcraft, tuberculosis diagnosis or medication, or shared public toilets) **Theme 4: Health system barriers** Participants noted that they were not given adequate support, poor care at clinic and incorrect information from healthcare professionals. However, these experiences did not deter participants from going to clinic and thought it was inevitable and necessary especially for treatment.

	Female participants express limited resistance in order to get treated quickly; Males described delaying visit and opting for informal treatments via friends/pharmacies. Some participants even after meeting a nurse for treatment still had limited understanding of STIs. **Theme 5: Interpersonal barriers** Some noted that fear of stigma and accusations of infidelity were barriers to notification, or concern about violent reactions. Women perceived men as 'being difficult or stubborn' as a barrier to altering risk behaviour and discussing PN (interpersonal power) Participants said that partners tried to avoid talking about sexual health but participants insisted because they knew the importance of receiving care. Male participants were confident regrading PN and thought that notifying partners would be received as an act of care and clinic visit would be without protest **Theme 6: Impact of the intervention (counselling)** Informed about STI and PN Participants felt better informed about STIs and what to do if they suspect they are infected. Participants also said that it encouraged them to use barrier methods of contraception and how to explore their sexual network to better notify partners

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

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?	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 directness	Overall risk of bias	Low
	Directness	Partially applicable *(The study looked at only method of notification and spoke about PN more generally; population includes only people from non-OECD country only with a different healthcare system and different culture and views on partner notification, relationships and sex)*

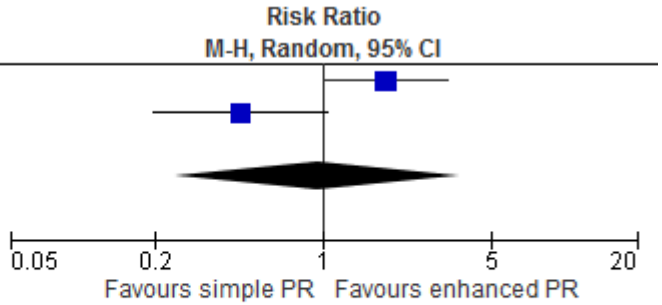
Appendix E – Forest plots

E.1 STI re-infection in index patients

Figure 1: Simple patient referral compared to enhanced patient referral

Study or Subgroup	Simple patient referral Events	Total	Enhanced patient referral Events	Total	Weight	Risk Ratio M-H, Random, 95% CI
Wilson 2009 (1)	29	285	16	287	52.3%	1.83 [1.01, 3.29]
Cameron 2009 (2)	7	70	15	68	47.7%	0.45 [0.20, 1.04]
Total (95% CI)		**355**		**355**	**100.0%**	**0.94 [0.24, 3.67]**
Total events	36		31			

Heterogeneity: Tau² = 0.83; Chi² = 7.17, df = 1 (P = 0.007); I² = 86%
Test for overall effect: Z = 0.09 (P = 0.93)



Footnotes
(1) Enhanced PR: counselling, pamphlet on partner notification and referral slips
(2) Enhanced PR: postal testing kit

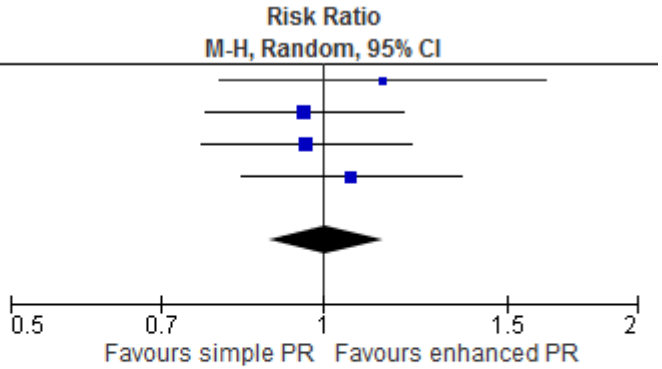
E.2 Number of sex partners contacted

Estcourt 2015 is a 3-arm trial with 2 arms (APTHotline and APTPharmacy) compared to a control arm. To prevent double counting of participants in the control arm, the total number of partners and number of partners contacted in the control arm were divided between the two comparison arms.

Figure 2: Simple patient referral compared to enhanced patient referral

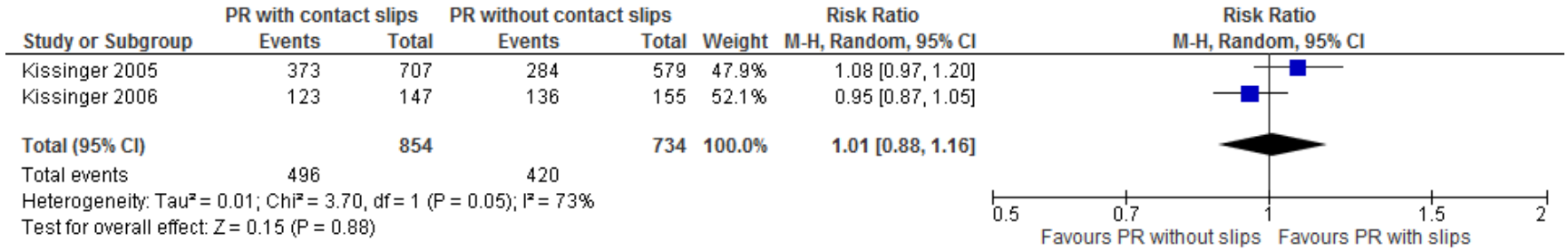
	Enhanced patient referral		Simple patient referral			Risk Ratio
Study or Subgroup	Events	Total	Events	Total	Weight	M-H, Random, 95% CI
Cameron 2009 (1)	41	110	36	110	12.0%	1.14 [0.79, 1.63]
Estcourt 2015 1 (2)	75	111	36	51	32.7%	0.96 [0.77, 1.19]
Estcourt 2015 2 (3)	66	100	35	51	28.9%	0.96 [0.76, 1.21]
Wilson 2009 (4)	92	287	86	285	26.3%	1.06 [0.83, 1.36]
Total (95% CI)		**608**		**497**	**100.0%**	**1.01 [0.89, 1.14]**
Total events	274		193			

Heterogeneity: Tau² = 0.00; Chi² = 1.12, df = 3 (P = 0.77); I² = 0%
Test for overall effect: Z = 0.09 (P = 0.93)



Footnotes
(1) Enhanced PR: postal testing kit
(2) Enhanced PR: ATP Hotline
(3) Enhanced PR: ATP Pharmacy
(4) Enhanced PR: counselling, pamphlet on PN and referral slips

Figure 3: Patient referral with contact slips compared to without contact slips



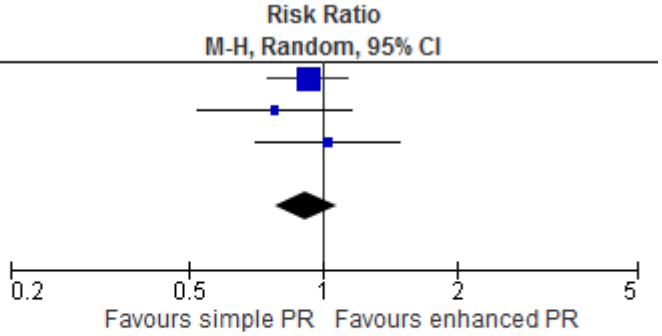
E.3 Number of sex partners treated

Estcourt 2015 is a 3-arm trial with 2 arms (APTHotline and APTPharmacy) compared to a control arm. To prevent double counting of participants in the control arm, the total number of partners and number of partners treated in the control arm were divided between the two comparison arms.

Figure 4: Simple patient referral compared to enhanced patient referral

	Enhanced patient referral		Simple patient referral			Risk Ratio
Study or Subgroup	Events	Total	Events	Total	Weight	M-H, Random, 95% CI
Apoola 2009 (1)	62	100	67	100	63.2%	0.93 [0.75, 1.14]
Estcourt 2015 1 (2)	39	111	23	51	17.2%	0.78 [0.53, 1.16]
Estcourt 2015 2 (3)	46	100	23	51	19.6%	1.02 [0.70, 1.48]
Total (95% CI)		**311**		**202**	**100.0%**	**0.92 [0.78, 1.08]**
Total events	147		113			

Heterogeneity: Tau² = 0.00; Chi² = 0.98, df = 2 (P = 0.61); I² = 0%
Test for overall effect: Z = 1.05 (P = 0.29)

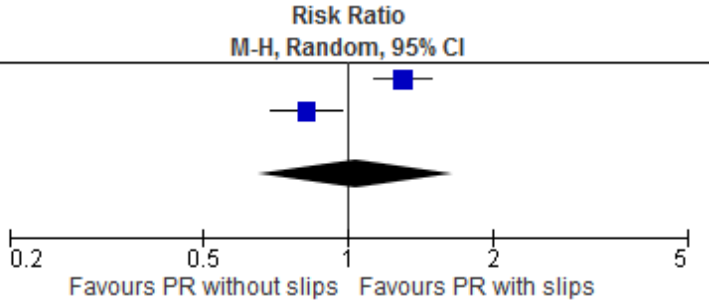


Footnotes
(1) Enhanced PR: Urine testing kit
(2) Enhanced PR: ATPHotline
(3) Enhanced PR: ATP Pharmacy

Figure 5: Patient referral with contact slips compared to without contact slips

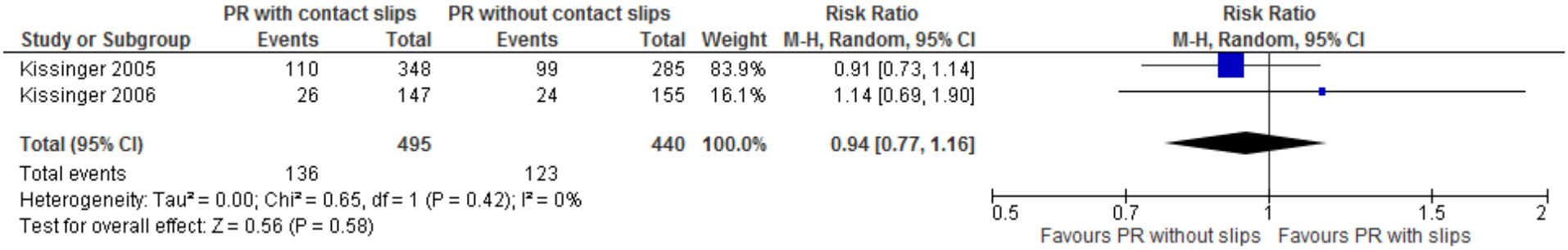
	PR with contact slips		PR without contact slips			Risk Ratio
Study or Subgroup	Events	Total	Events	Total	Weight	M-H, Random, 95% CI
Kissinger 2005	322	707	203	579	50.6%	1.30 [1.13, 1.49]
Kissinger 2006	85	147	109	155	49.4%	0.82 [0.69, 0.98]
Total (95% CI)		**854**		**734**	**100.0%**	**1.04 [0.65, 1.64]**
Total events	407		312			

Heterogeneity: Tau² = 0.10; Chi² = 17.54, df = 1 (P < 0.0001); I² = 94%
Test for overall effect: Z = 0.15 (P = 0.88)



E.4 Unprotected sex at 4 weeks

Figure 6: Patient referral with contact slips compared to without contact slips



Appendix F – GRADE tables

F.1 Re-infection with STI in index patients

F.1.1 Simple patient referral vs. enhanced patient referral

Quality assessment							No of patients		Effect		Quality
No of studies	Design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	Intervention	Control	Relative (95% CI)	Absolute	
Re-infection in index patents (follow-up: >6 months; assessed with: microbiologically verified cultures)											
2[a]	randomised trials	serious[1]	very serious inconsistency[2]	no serious indirectness	very serious[3]	None	31/255 (8.7%)	36/355 (10.1%)	RR 0.94 (0.24 to 3.67)	5 fewer per 1000 (from 66 fewer to 233 more)	VERY LOW

[a] Cameron 2009 (postal testing kit), Wilson 2009 (counselling, pamphlet and referral slips)
[1] Downgraded once for some concerns of bias for missing outcome data, measurement of outcome and the trials were not registered.
[2] Downgraded twice due to I^2 = 86%
[3] Downgraded twice as 95%CI crosses line of no effect and 2 MIDs.

F.1.2 Simple patient referral vs. provider notification

Quality assessment							No of patients		Effect		Quality
No of studies	Design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	Intervention	Control	Relative (95% CI)	Absolute	
Re-infection in index patients (follow-up: 1 month; assessed with: microbiologically verified cultures)											
Schwebke 2010	randomised trial	very serious[1]	N/A	no serious indirectness	very serious[2]	None	15/100 (15%)	9/92 (10%)	RR 1.53 (0.71 to 3.33)	52 more per 1000 (from 28 fewer to 228 more)	VERY LOW
Re-infection in index patients (follow-up: 3 months; assessed with: microbiologically verified cultures)											
Schwebke 2010	randomised trial	very serious[1]	N/A	no serious indirectness	very serious[2]	None	5/64 (7.8%)	3/60 (5%)	RR 1.56 (0.39 to 6.26)	28 more per 1000 (from 31 fewer to 263 more)	VERY LOW

[1] Downgraded twice for high risk of bias in effect of assignment to intervention.
[2] Downgraded twice as 95%CI crosses line of no effect and 2 MIDs

F.2 Number of partners contacted

F.2.1 Simple patient referral compared to enhanced patient referral

Quality assessment							No of patients		Effect		Quality
No of studies	Design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	Intervention	Control	Relative (95% CI)	Absolute	
Number of partners contacted (follow-up: 6 weeks; assessed with: index patient self-report)											
3[a]	randomised trials	serious[1]	no serious inconsistency	no serious indirectness	serious[2]	None	274/608 (45.1%)	193/497 (38.8%)	RR 1.01 (0.89 to 1.14)	4 more per 1000 (from 43 fewer to 54 more)	LOW

[a] Cameron 2009 (postal testing kits), Estcourt 2015 (2 arms: telephone consultation and pharmacy consultation), Wilson 2009 (counselling, pamphlet on PN and referral slips).
[1] Downgraded once for some concerns of bias due to randomisation process, missing outcome data and the trials were not registered.
[2] Downgraded once as the 95% CI crosses the line of no effect.

F.2.2 Patient referral with contact slips compared to patient referral without contact slips

Quality assessment							No of patients		Effect		Quality
No of studies	Design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	Intervention	Control	Relative (95% CI)	Absolute	
Number of partners contacted (follow-up: 6 weeks; assessed with: index patient self-report)											
2[a]	randomised trials	serious[1]	serious[2]	no serious indirectness	serious[3]	None	496/854 (58.1%)	420/734 (57.2%)	RR 1.01 (0.88 to 1.16)	6 more per 1000 (from 69 fewer to 92 more)	VERY LOW

[a] Kissinger 2005, Kissinger 2006.
[1] Downgraded once for some concerns of bias for one study due to problems with high attrition and differential attrition by intervention arm; and some concerns of bias for one study due to problems with randomisation; both trials not registered.
[2] Downgraded once due to high I^2 = 73%
[3] Downgraded once as the 95% CI crosses the line of no effect

F.3 Number of partners treated

F.3.1 Simple patient referral compared to enhanced patient referral

Quality assessment							No of patients		Effect		Quality
No of studies	Design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	Number of partners treated	Control	Relative (95% CI)	Absolute	
Number of partners treated (follow-up: 6 weeks; assessed with: index patient self-report; lower RRs favour control)											
2[a]	randomised trials	serious[1]	no serious inconsistency	no serious indirectness	serious[2]	none	147/311 (47.3%)	113/202 (55.9%)	RR 0.92 (0;78 to 1.08)	45 fewer per 1000 (from 123 fewer to 45 more)	LOW

[a] Apoola 2009 (urine home testing kit); Estcourt 2015 (telephone consultation and pharmacist consultation)
[1] Downgraded once for some concerns of bias due to randomisation process, missing outcome data and trials were not registered.
[2] Downgraded once as 95% CI crosses line of no effect and 1 MID.

F.3.2 Simple patient referral with contact slips compared to patient referral without contact slips

Quality assessment							No of patients		Effect		Quality
No of studies	Design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	Intervention	Control	Relative (95% CI)	Absolute	
Number of partners contacted (follow-up: 6 weeks; assessed with: index patient self-report)											
2[a]	randomised trials	serious[1]	very serious[2]	no serious indirectness	very serious[3]	None	407/854 (47.7%)	312/734 (42.5%)	RR 1.04 (0.65 to 1.64)	17 more per 1000 (from 149 fewer to 272 more)	VERY LOW

[a] Kissinger 2005; Kissinger 2006
[1] Downgraded once for some concerns of bias for one study due to high attrition and differential attrition by intervention arm; and some concerns of bias for one study due to problems with randomisation; both trials not registered.
[2] Downgraded twice due to high I^2 = 94%
[3] Downgraded twice as 95% CI crosses line of no effect and 2MIDs

F.4 Number of partners tested

F.4.1 Postal testing kit vs patient referral with slips

Quality assessment							No of patients		Effect		Quality
No of studies	Design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	Intervention	Control	Relative (95% CI)	Absolute	
Number of partners tested (follow-up: 12 months; assessed with: centrally available database; lower numbers favour referral slips)											
Cameron 2009	randomised trial	serious[1]	N/A	no serious indirectness	serious[2]	none	51/124 (41%)	46/134 (34%)	RR 1.20 (0.87 to 1.64)	69 more per 1000 (from 45 fewer to 220 more)	LOW

[1] Downgraded once for some concerns of bias due to missing outcome data and trial not registered.
[2] Downgraded as 95% CI crosses line of no effect and 1 MID.

F.5 Number of partners diagnosed with STI

F.5.1 Postal testing kit vs patient referral by referral slips

Quality assessment							No of patients		Effect		Quality
No of studies	Design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	Intervention	Control	Relative (95% CI)	Absolute	
Number of partners diagnosed with STI (follow-up: 12 months; assessed with: centrally available database; higher numbers favour postal testing kit[a])											
Cameron 2009	randomised trials	serious[1]	N/A	no serious indirectness	serious[2]	none	31/124 (25%)	20/134 (14.9%)	RR 1.67 (1.01 to 2.78)	100 more per 1000 (from 1 more to 266 more)	LOW

[a] A higher RR means more partners tested positive in the postal testing kit arm.
[1] Downgraded once for some concerns of bias due to missing outcome data and trial not registered.
[2] Downgraded once as 95% CI crosses 1 MID.

F.6 Unprotected sex at 4 weeks

F.6.1 Patient referral with contact slips compared to patient referral without contact slips

Quality assessment							No of patients		Effect		Quality
No of studies	Design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	Intervention	Control	Relative (95% CI)	Absolute	
Number of participants who had unprotected sex after intervention (follow-up: 4 weeks; assessed with: self-report; lower numbers favour booklet-enhanced patient referral)											
2[a]	randomised trials	serious[1]	N/A	no serious indirectness	serious[2]	none	136/496 (27.5%)	123/440 (28.0%)	RR 0.94 (0.77 to 1.16)	17 fewer per 1000 (from 64 fewer to 45 more)	LOW

[a] Kissinger 2005; Kissinger 2006
[1] Downgraded once for some concerns of bias for one study due to high attrition and differential attrition by intervention arm; and some concerns of bias for one study due to issues with randomisation; both trials not registered.
[2] Downgraded once as the 95% CI crosses line of no effect and 1MID.

F.7 Number of partners traced

F.7.1 Patient referral by standard letter plus informational website for partner vs patient referral by standard letter only

Quality assessment							No of patients		Effect		Quality
No of studies	Design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	Intervention	Control	Relative (95% CI)	Absolute	
Number of partners traced (RR based on total number of identified partners; follow-up: 4 weeks; assessed with: self-report; higher numbers favour intervention)											
Tomnay 2006	randomised trial	very serious[1]	N/A	no serious indirectness	serious[2]	none	102/161 (63.4%)	50/69 (72.5%)	RR 0.87 (0.73 to 1.05)	94 fewer per 1000 (from 196 fewer to 36 more)	VERY LOW

[1] Downgraded twice for high risk of bias due to deviations from the intended interventions.
[2] Downgraded once as 95% CI crosses line of no effect and 1 MID.

Appendix G – GRADE-CERQual tables

G.1 Acceptability of partner notification methods

Table 2: CERQual findings on the acceptability of partner notification methods

Summary of review finding	Studies contributing to the review finding	Methodological limitations	Relevance	Coherence	Adequacy	CERQual assessment of confidence in the evidence
Relationship status between index patient and partner influences acceptability of methods Which methods are acceptable depend on the relationship between partners. Participants felt a moral responsibility to tell partners face-to-face if they had a more intimate or regular relationship with them. Participants felt that partners deserved respect when being told as it is an intimate problem and it allows the index patient to provide support to the partner if they are face-to-face, even if they found it intensely stressful. There was disagreement between participants on which methods to use for casual partners. Some participants did not think they needed to notify less regular partners face-to-face because they did not feel as much responsibility for them, choosing a phone call, SMS or provider referral instead. However, some people still felt that notifying in person was the best method in any situation even though they said it was difficult.	Cavalcante 2016 Coleman 2007 Contesse 2019 Goyette 2016 Hopkins 2010 Lessard 2019 Reed 2015 Tomnay 2017 Wood 2018	No or very minor concerns (studies had high number of participants; semi-structured interview technique allowed richness of data to be reported; one study does not include quotes only summaries of interviews)	No or very minor concerns (most data is of direct relevance and is applicable to the context specified in the review question)	Moderate concerns (there is disagreement between the participants on the finding)	No or very minor concerns (data is rich and comes from 9 out of 12 studies;)	Moderate confidence (This finding is graded as moderate confidence because there were an adequate number of studies that contributed to the finding but the studies did not always agree with each other)

Summary of review finding	Studies contributing to the review finding	Methodological limitations	Relevance	Coherence	Adequacy	CERQual assessment of confidence in the evidence
Supporting statements: *Regular partners* "It seemed like the right thing to do. I think he deserved for me to tell him with him there and not just call him up." "You've just got to be very brave to do it. Having to talk to someone about such a big issue is very hard." "I was pretty much shaking to be honest. it was definitely the hardest conversation I've ever had to have in my life and I didn't know how he was going to react or what he was going to say." *Providing support* "By doing it face-to-face, you can see their reactions more and judge how they are feeling about it. And if you can judge their reactions or their body language you can sort of say the things you need to make them feel better about the situation as well." "...I felt more comfortable that I could see their reaction and it was just more courteous to tell them to their face." *Non-regular partners* "I guess to me – it sounds bad but it would depend on how close the relationship with the person that you've slept with, if it was a one night stand or if it was a regular type. I think obviously if it was a one-time fling or someone that you're quite distant to then it's scary." "If there's somebody that maybe like your fuck buddy or somebody who is a regular partner, or someone you have some emotional connection to, not just a stranger. If it's a stranger, it doesn't really matter." "I would SMS someone if it was a one-night stand and I didn't really care about them. I would be just letting them know." "Personally, I will try to text the person if I know they can take it. But recently, there was a person, I did not know how to tell them, so I preferred to wait to see that person and tell them live." *Face-to-face is always best option* "But for me it was just a case of having to suck it up and do it really because I take responsibility for my own actions and I didn't think it was fair not to tell people." "I think it's the only way to go. And they think more of you and they commend you, really, even though you've given them an STD." "It (email) is so informal. I think if you're going to tell somebody you have an STI you need to show a good enough level of respect to tell them in person, especially if they are going to take you seriously and go and get treated."						
Ease and practicality of notifying partners	Hopkins 2010 Lessard 2019 Reed 2015	Moderate concerns	No or very minor concerns	Moderate concerns	Moderate concerns	Moderate confidence

Summary of review finding	Studies contributing to the review finding	Methodological limitations	Relevance	Coherence	Adequacy	CERQual assessment of confidence in the evidence
Participants considered the practical aspects of notifying partners by different methods. Face-to-face patient referral was seen as the best method for partner notification, because it is quick and reliable, but participants understood that this is not always possible. Phone calls were used when people thought speed was necessary. Letters and emails, and SMS to a lesser degree, were seen as acceptable only when face-to-face or phone calls were not possible because it was difficult to contact partners as they had moved far away. A letter was seen as acceptable because it was still a personal way to tell someone. In MSM, apps received a mixed response as participants thought they may be inconvenient in many situations as they would not be carrying their phones, but other participants thought it was a good way to vet partners, link up with health services, and promote good sexual health. There were mixed views from index patients and partners on whether provider referral were good ways to make sure messages are taken seriously, protect anonymity, and deliver news safely.		(studies had high number of participants; semi-structured interview technique allowed richness of data to be reported; one study does not include quotes only summaries of interviews)	(data is of direct relevance and is applicable to the context specified in the review question)	(There was much disagreement between people on and which was most practical and many decisions were based on personal preference with no other apparent factors considered)	(data is rich and covers different methods but comes from 3 out of 12 studies)	(for lack of agreement between participants and lack of adequacy)
Supporting statements: *Face-to-face or calling*						

Summary of review finding	Studies contributing to the review finding	Methodological limitations	Relevance	Coherence	Adequacy	CERQual assessment of confidence in the evidence
"I can do it straight away. As soon as I find out I can give them a call. I don't have to make arrangements to meet them somewhere and take time out of their day just so I can tell them something." "It was the quickest and most convenient way at the time. As soon as I found out I wanted to let people know straightaway." *SMS or social media messaging* "I try to notify my partners systematically, at least those I know, not necessarily my regular partners only, but guys on dating apps. I send them messages, and they do what they want. But there are many for who I do not have the coordinates, so I can't do it." *Letters and emails* "It's much more personal to get something hand-written from someone and I think that if you are not able to say it out loud but you want to be more caring then it's a very good option." "It (email) is so informal. I think if you're going to tell somebody you have an STI you need to show a good enough level of respect to tell them in person, especially if they are going to take you seriously and go and get treated." *Apps* "It will be difficult to introduce it [the app] at the end of intercourse." "I do not see it as advisable for sex parties. Or maybe at the beginning of the party. When someone gets there, I tell him to flash [show him the app], and he must flash everybody. When a new person comes in, everybody must flash this new person, it leads to a lot of flashes. And you must stop people, tell them wait, somebody got here, get your phone out." "If I meet someone, it depends on the circumstances. I cannot imagine myself telling him to get his phone out for a flash. It takes away the moment, the meeting. If it's only sex, several times, it is well-adapted, and there are more risks. But if it's a beautiful meeting or something fun, I don't think I'll flash." "Clearly, if I'm with someone and I ask him: "did you download the app?". He says yes or no. Already, I have an indication of the type of person he is." "It's already a new tool for discrimination. It will be: "you don't want to flash, then I don't have sex with you", like "masc for masc" [masculine for masculine] or "clean for clean"" *Provider referral* "It [getting tested] is the most logical thing to do. If you have an entity telling you that you may have been exposed to something, are you willing to take the risk that it is false?" "A health department has some credibility rather than an anonymous person who may or may not be real." "I think it's a good idea. They could also answer questions that people have in general rather than just delivering bad news"						

Summary of review finding	Studies contributing to the review finding	Methodological limitations	Relevance	Coherence	Adequacy	CERQual assessment of confidence in the evidence
"[I] worry about the Big Brother aspect but appreciate the notification" "That feels spineless. If I did this to someone, I need to be the one to tell them."						
Concerns of disclosing STI, relationship and sexuality status Participants were concerned that different methods of partner notification could lead to their STI status and sexuality being widely known. Participants did not agree on which method would protect their privacy the most. Some participants did not want their partner to know that they had infected them and would rather providers notify partners instead and retain anonymity. Some participants also said that notifying partners face-to-face may make them known as infected in their community. Some MSM believed that provider referral would expose them because they lived in a small community. Some participants in monogamous relationships did not know which notification method would be best to let their partners know they may be infected, especially since this may expose their sexuality. Some participants were afraid that email, letters and SMS could be shown to others leading to shame and stigma.	Coleman 2007 Contesse 2019 Goyette 2016 Hershow 2019 Hopkins 2010	No or very minor concerns (studies had high number of participants; semi-structured interview technique allowed richness of data to be reported)	Moderate concerns (3/5 studies are of direct relevance and are applicable to the context specified in the review question; 2/5 are partially applicable)	Serious concerns (participants views are very conflicting)	Moderate concerns (5 out of 12 studies reported on this theme)	Low confidence (findings are variable and people's views on the topic are likely change considerably from person to person for a given situation)

Summary of review finding	Studies contributing to the review finding	Methodological limitations	Relevance	Coherence	Adequacy	CERQual assessment of confidence in the evidence
Some participants did not want their STI data to be kept within an app that could share that data elsewhere.						

Supporting statements:

Anonymity

‘‘I think it [declining accelerated partner services] is because of trust. I thought that by giving them the names and contacts of my partners, they would tell them that I am the one who gave their contacts because I tested HIV-positive.’’

“I think the SMS thing is the best thing I’ve heard. The gay community in Melbourne is very, very small and so it would be good to be able to send out an anonymous SMS.”

“…it just seemed to me, when my doctor described me the option [provider referral services], it was the best way to do it because it was all done anonymously.”

Exposure in the community

“When the town is socially conservative and homophobic, there is a great chance in the health department that the workers would be uncompassionate and biased.”

“I think it is a very hard thing to do…and I think I would be…especially…in the gay community…in the gay scene…it would be very easy for somebody to point the finger…and say…he said this…or he is kind of like…he is the one with the big infection…and he is the one that started it and he told me and blah blah blah…I couldn’t see myself doing that.”

“I wouldn’t want to hear from the health department here. Everyone knows everyone. This is small town Tennessee.”

“When you start following us home, you find that maybe a neighbour had been followed before and so will know there’s nothing else, they are here for HIV testing”

Sexuality

“Yeah, I thought it was the best thing to do. It’s hard to know now. You see, unfortunately if I told her I was bisexual it would probably have a wider implication. Would she tell the children? Then their attitude would be different. Would she tell relations? It would affect far more than just me. Where, if I said I was with a prostitute, which I did say, it would be, ‘It’s just a once off thing, it doesn’t affect what you are or how you are.”

Shown to others

“I think a negative with both SMS and email is that anyone could see it. I don’t think it’s private. I wouldn’t risk anybody else seeing it or showing his mates and saying, “Look at what this chick sent me.””

“Something written down like that could actually be read by someone else. No-one really writes letters now, except thank you letters.”

Summary of review finding	Studies contributing to the review finding	Methodological limitations	Relevance	Coherence	Adequacy	CERQual assessment of confidence in the evidence
"Anyone can go through someone's phone and read it (the SMS) and be like, "Oh my God, that person is bad and they got it from this person," and then they start spreading rumours." *Exposure to higher authorities* "A few men disliked the idea of the government knowing what apps they are on: "[I] worry about the Big Brother aspect but appreciate the notification".						
Some methods can be intrusive Some participants felt that direct clinical action in the form of provider referral without input from the index partner was intrusive. Some participants believed these methods were cold, systematic and showed a lack of care for the partner. It also left some partners with unanswered questions and some felt powerless due to an invasion in privacy. Some participants felt partners needed a push to go to clinic. Others believed these methods showed caring because they show the index patient is taking the risk of infection seriously, taking precautions and comes under their duty of care to prevent onward transmission. Some partners also trusted healthcare professionals to take forward the possibility of infection because it is part of their role, and were thankful to be notified regardless of the method.	Coleman 2007 Contesse 2019 Goyette 2016 Hershow 2019 Reed 2015	Moderate concerns (studies had high number of participants; semi-structured interview technique allowed richness of data to be reported; one study does not include quotes only summaries of interviews)	Moderate concerns (3/5 studies are of direct relevance and are applicable to the context specified in the review question; 2/5 are partially applicable)	Serious concerns (participants views are very conflicting, but findings match up with other findings in the review)	No or very minor concerns (5 out of 12 studies reported on this finding)	Low confidence (participants views were different for the same or similar situations and more evidence is required to understand why these differences exist)
Supporting statements: *Intrusive*						

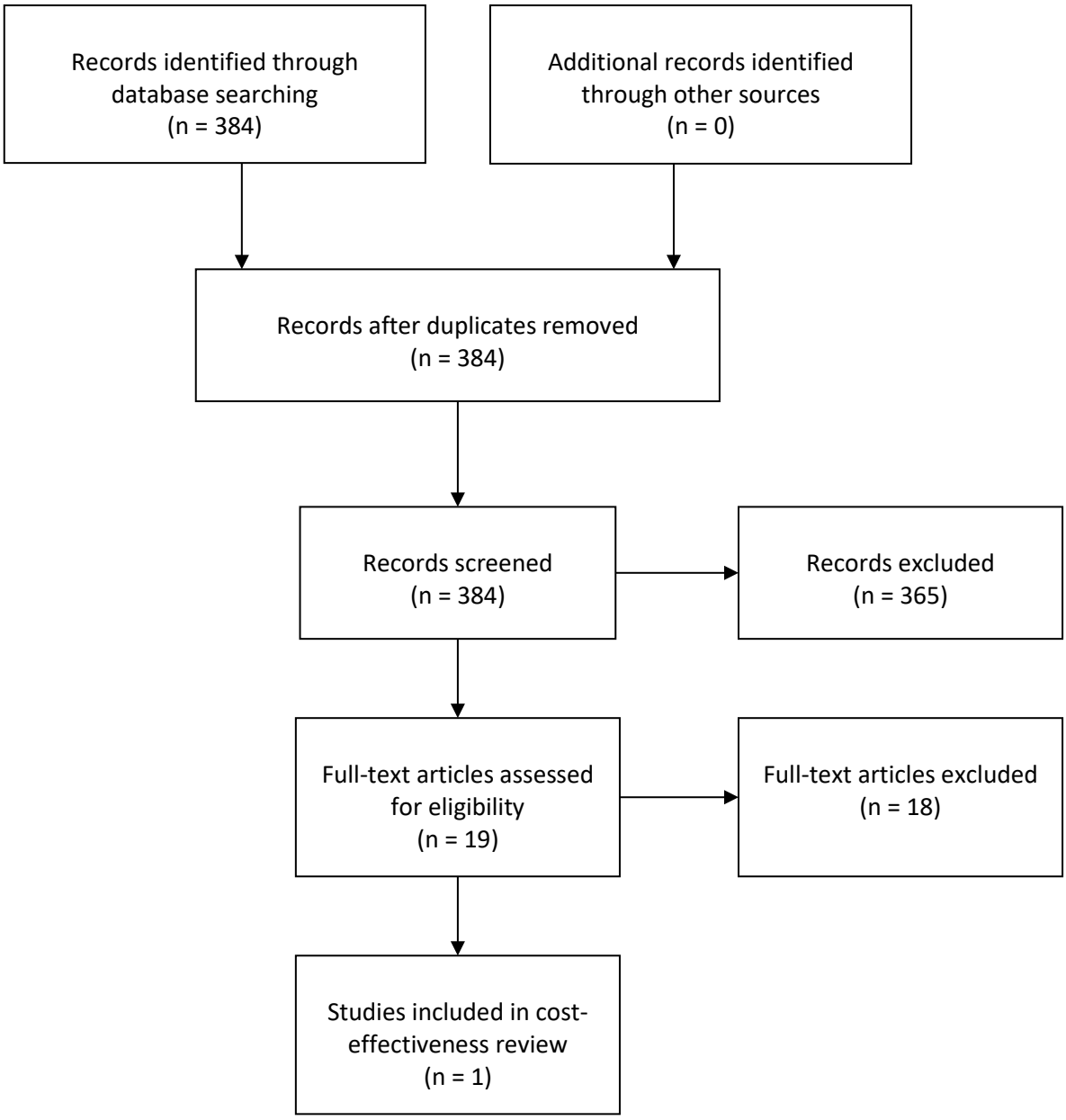
Summary of review finding	Studies contributing to the review finding	Methodological limitations	Relevance	Coherence	Adequacy	CERQual assessment of confidence in the evidence
"(My) head started running around trying to think…who would have given it [his phone number] out…or is somebody winding me up?" "There was a sense of…intrusion, and of…I think this feeling of powerlessness…Someone is ringing you with this bit of news and they have power of you or something…and it's just…you are so aware of your vulnerability" "I have had that happen [been notified by partner services staff from the health department], and while it was somewhat impersonal, it was helpful and informative." "There needs to be someone to shake them [men] up. 'You need to know your status!' So, the phone method is good, you send letters to them. They cannot refuse, they can accept." *Personal duty of care* "I would feel safer and more taken care of if the person [health department staff] was knowledgeable of the issues and history and complexity of the gays. Someone who has worked with the gay community on health issues." "If he was my husband and the father of my children, I would have definitely notified him or even held his hands and come with him to the hospital. You know this one is different. He is just my lover and I don't know where he comes from.'' *Healthcare professionals' role* "I think it's [having healthcare department profiles on apps] a good idea. They could also answer questions that people have in general rather than just delivering bad news" "I think it's best for your partner to go in and see a doctor and possibly speak to them because they totally understand the disease. I think it would be a little more professional to refer them than just giving them some antibiotics." "He counselled me and told me not to be scared because I will not be the first or the last to test positive. I gained courage after the talk and tested positive. I asked if my state was so bad and I was about to die, but he told me that I am not doing bad. That I was still very strong. He told me to start medication and make sure I adhere to the doctor's instructions to the letter, and that I will even bury so many people who will be dying from other diseases not necessarily HIV, and I felt I was calm and ok with the results. So, I am continuing with drugs." "For me, I was so nervous when I entered the room and my business was I don't want to be asked questions. I just wanted the test to be done and know the result. But the person [HTC counsellor] was not in a hurry to even do the test, so he asked first, 'Hey, where do you come from, how many partners do you have?' To some extent, I relaxed. I even started giving some stories. And I saw 'so, it is not a big thing to know one's status' . when it came to the test, I was so much relaxed."						
Stress relating to anticipated but often unrealised conflict, consequences and violence	Coleman 2007 Contesse 2019 Hopkins 2010	No or very minor concerns	No or very minor concerns	Moderate concerns	Moderate concerns	Moderate concerns

Summary of review finding	Studies contributing to the review finding	Methodological limitations	Relevance	Coherence	Adequacy	CERQual assessment of confidence in the evidence
Participants were concerned by their partners' reactions to being notified. This created anxiety and stress relating to telling their partners. For people whose partners may have an abusive or violent reaction, many wanted to use provider referral to protect themselves from the initial reaction of their partners. Many participants found that their partner's reaction was not as bad as anticipated and that they were grateful for the face-to-face interaction and were supportive. The anxiety people felt before telling partners was a fear because of the uncertainty in reaction from partners but many of these fears were found to be unwarranted. This stress was experienced in participants with regular or casual partners and supportive reactions came equally from casual and regular partners. Other participants knew that reactions would end up in conflict but decided to notify their partners in person anyway.	Tomnay 2017 Wood 2018	(studies had high number of participants; semi-structured interview technique allowed richness of data to be reported)	(most data is of direct relevance and is applicable to the context specified in the review question)	(some disagreement between some participants around whether they would use face-to-face patient referral and when they would use provider referral when they feared reactions)	(no data on potentially angry or violent partners' reactions to receiving a letter)	(no data on angry/violent partners' reactions and disagreement around when people feel comfortable using provider referral)
Supporting statements: *Concerns and stress* "Driving home I had to go through all the possible scenarios…not knowing how he would react." "I was pretty much shaking to be honest. it was definitely the hardest conversation I've ever had to have in my life and I didn't know how he was going to react or what he was going to say." "I disagree about the spineless part. If a person was closeted or needed some level of anonymity, I respect that he would go to a health professional at all."						

Summary of review finding	Studies contributing to the review finding	Methodological limitations	Relevance	Coherence	Adequacy	CERQual assessment of confidence in the evidence
"I wouldn't want to do that....I'd feel dirty standing there telling them, "Oh, by the way, I have Chlamydia and you have to get yourself checked out". They'd stare me up and down and say, "That's gross"." *Violence* "I thought about it on my way home and I said, 'No, I am just going to confront him and tell him out straight.' I thought maybe he might hit me…but I had to do it." "I cannot tell them because I don't want them to come to my house and they know my place, I don't want them attacking me, like blackmailing me. I don't want this to happen, I don't want to hurt my family even more, that is my biggest concern." "I think that [a letter from a healthcare professional] would be fantastic. It takes away the strain of the situation. It absolutely has some 'street cred'. And the person is not friggin' going to come and knock down your door and say, "You gave me chlamydia, you bitch." And in that way, they do know to get tested and I suppose it's their responsibility then." *Telling partners face-to-face anyway* "He can insult me and what-not, but even if that happens, I don't have a problem with that. As long as I have told him 'Okay listen brother, you must go to the clinic. You will tell them that you have an STI. So please go.' And I think he will go." *Fear unwarranted* "No, it wasn't what I expected at all. Yeah, I was expecting him to—I was scared. I was scared of how he was going to react. I thought he would be angry or telling me I'm wrong or start abusing me but, yeah, very lucky (that the partner didn't react in this way)." "I was a little bit worried that I didn't know them as well as I did and they might go off. Yeah, they were great. Everybody's been great actually."						
<u>Coaching to improve patient referral experience</u> Participants felt large amounts of embarrassment, stress and responsibility when notifying partners. Some felt that they could have done it better had they had counselling or preparation in how best to deliver bad news. Especially since index patients are dealing with the stress of diagnosis and management themselves. Index	Cavalcante 2016 Coleman 2007 Contesse 2019 Goyette 2016 Tomnay 2017 Wood 2018	No or very minor concerns (studies had high number of participants; semi-structured interview technique allowed richness of data to be reported)	No or very minor concerns (most data is of direct relevance and is applicable to the context specified in	No or very minor concerns (Vast majority of people asked about coaching were positive, with only one comment against it)	No or very minor concerns (6 out of 12 studies reported on this finding and a wide range of populations	High confidence (agreement in findings between population groups in different studies)

Summary of review finding	Studies contributing to the review finding	Methodological limitations	Relevance	Coherence	Adequacy	CERQual assessment of confidence in the evidence
patients were also aware that they were the first person that could support the partner and wanted to be better prepared to do this. However, there was a small minority that felt coaching was cold and unnecessary.			the review question)		agreed on the finding)	
Supporting statements: *Positive views* "I think what should be done is proper counselling to the clients. When I am properly counselled, I will be able to provide the contacts of my partners so that they are notified or I come with him." "A lot of people don't know how to talk to people or what to say, especially about this subject. I think it would be better if you told people how to talk." "I think it's [PN] such a vital service I think. I mean, I think getting HIV does change you mentally and emotionally I think and you could go either way. So I think having someone to talk to is, yeah is paramount." "Oh definitely. Just having some ideas of how you're going to respond to questions or just to how they react—to reactions and stuff like that—I think that would be extremely helpful. Yeah." "I learned a lot; I learned some things I didn't know. And other diseases we discussed here have never occurred to me before. I am going to try to avoid them totally. I wouldn't have known those things and I would neglect them. But now I know what caused this in me and that if this happens, I must go to the clinic." *Negative views* "I wouldn't want coaching. That makes it cold and impersonal. I would thank them [partner services staff] and decline. I prefer to do things my way so I know my point gets across."						

Appendix H – Economic evidence study selection



Appendix I – Economic evidence tables

Study	Nichols BE, Götz HM, van Gorp ECM, Verbon A, Rokx C, Boucher CAB, et al. (2015) Partner Notification for Reduction of HIV-1 Transmission and Related Costs among Men Who Have Sex with Men: A Mathematical Modeling Study. PLoS ONE 10(11): e0142576			
Study details	**Population & interventions**	**Costs (incremental costs for partner notification versus usual care)**	**Outcomes (incremental QALYs for partner notification versus usual care)**	**Cost effectiveness (ICERs for partner notification versus usual care)**
Economic analysis: Cost utility analysis **Model type:** Markov model **Approach to analysis:** Six compartment Markov model, with an initial acute stage, follow by three chronic stages defined by CD4 cell count (200-250, 250-500 and >500), and two AIDS stages. With no partner individuals are assumed to be tested at rates that allow the modelled CD4 cell count distribution at diagnosis to match the current CD4 cell count distribution at diagnosis in the Dutch gay, bisexual and other men who have sex with men (GBMSM) population. The model calibration was based on: estimated Dutch GBMSM population size, number diagnosed with HIV, percentage diagnosed with a CD4 <200 cells/µl, and percentage diagnosed with CD4 200–350 cells/µl. Using Monte Carlo filtering techniques, 129 of 100,000 simulations that matched these	**Population:** Men who have sex with men with a new diagnosis of HIV (data from the Rotterdam region of the Netherlands). **Interventions** Online partner notification tool (Suggest-A-Test). After a patient is diagnosed, there is an intensive counselling process at the STI clinic in which partner notification is discussed. Patients choose whether to contact their partners on their own or through the Suggest-A-Test system (most choose to notify partners outside the tool). For an HIV diagnosis, it is advised	**Cost differences at 20 years:** Treat at CD4 cell count <500 cells/µl (5% of patients diagnosed via partner notification): €8,499,662 Treat at CD4 cell count <500 cells/µl (20% of patients diagnosed via partner notification): €32,005,785 Immediate treatment (5% of patients diagnosed via partner notification): €8,363,538 Immediate treatment (20% of patients diagnosed via partner notification): €31,372,511	**QALY differences at 20 years:** Treat at CD4 cell count <500 cells/µl (5% of patients diagnosed via partner notification): 1,519 Treat at CD4 cell count <500 cells/µl (20% of patients diagnosed via partner notification): 5,773 Immediate treatment (5% of patients diagnosed via partner notification): 1,517 Immediate treatment (20% of patients	Treat at CD4 cell count <500 cells/µl (5% of patients diagnosed via partner notification): €5,887/QALY Treat at CD4 cell count <500 cells/µl (20% of patients diagnosed via partner notification): €5,773/QALY Immediate treatment (5% of patients diagnosed via partner notification): €5,719/QALY Immediate treatment (20% of patients diagnosed via partner notification): €5,616/QALY Partner notification was cost-effective for both estimates of intervention effectiveness, regardless of whether treatment was immediate or delayed until CD4 cell count <500 cells/µl.

parameters were accepted and used in the analysis. **Perspective:** Third-party-payer perspective. **Time horizon:** Results reported at 5, 10, 15 and 20 years (20 years was taken as the preferred timepoint for NICE). **Discounting:** Costs were discounted at 4% per year, and QALYs at 1.5% per year (standard Dutch approach).	that the patient notifies all partners from the last 12 months and longer if possible. **Comparisons** Partner notification and treatment at CD4<500 cells/µl versus no partner notification and treatment at CD4<500 cells/µl. Partner notification and immediate treatment versus no partner notification and immediate treatment.	All based on a population size of approximately 176,000 people (the estimate of the GBMSM population in the Netherlands over the age of 15). **Currency & cost year:** Euros 2014	<u>diagnosed via partner notification):</u> 5,830 All based on a population size of approximately 176,000 people (the estimate of the GBMSM population in the Netherlands over the age of 15).	**Analysis of uncertainty:** Univariate sensitivity analyses were conducted on discount rates (for costs and QALYs), the effectives of partner notification, and the costs of ART and HIV testing. Changes in discount rates resulted in smaller changes than changes in either effectiveness or costs. Probabilistic sensitivity analysis was not conducted for cost and QALYs, but the simulation approach already appropriately captures this data for HIV dynamics.

Data sources

Partner notification: Two scenarios were modelled for the effectiveness of partner notification in early identification of new HIV diagnoses.

Scenario 1: Assumed that 5% of diagnoses can be ascertained through partner notification. Justification: In 2013, there were nine new HIV diagnoses via partner notification out of 366 GBMSM notified for any STI/HIV and tested for HIV. These nine new diagnoses represent approximately 4.7% of all new diagnoses in the entire Rotterdam region.

Scenario 2: Assumed that 20% of diagnoses can be ascertained through partner notification. Justification: nine new diagnoses represents 19.6% of new diagnoses at the Rotterdam Public Health Municipality.

HIV outcomes: Cohort study data on infectivity, duration of time in each disease state and mortality rates, and cohort study and RCT data on the reduction in transmission for people treated with ART were used to populate the model, with model calibration used to estimate sexual behaviour, HIV testing rates and the relationship between testing and ART treatment.

Quality of life weights:

Costs: Costs were based on local Rotterdam region costs where these were available and national Dutch cost estimates where these were not.

Comments

Source of funding: Netherlands Aids Foundation and European Union FP7 research funding.

Overall applicability: Partially applicable

Conducted from a Dutch perspective, with all the associated differences in populations, health systems and payment structures, but particularly meaning the discount rates used are different to those favoured in the UK, and are different for costs and QALYs

Overall quality: Minor limitations

Study only used a 20-year time horizon, and not a longer one that would be favoured by NICE (however, a longer time horizon is only likely to make the intervention appear more cost-effective, rather than less).

Appendix J – Health economic model

No economic modelling was undertaken for this review question.

Appendix K – Excluded studies

K.1 Effectiveness studies

Study	Code [Reason]
Althaus, Christian L, Turner, Katherine M E, Mercer, Catherine H et al. (2014) Effectiveness and cost-effectiveness of traditional and new partner notification technologies for curable sexually transmitted infections: observational study, systematic reviews and mathematical modelling. Health technology assessment (Winchester, England) 18(2): 1-viii	- More recent systematic review included that covers the same topic
Carnicer-Pont, Dolors, Loureiro-Varela, Eva, Manresa, Josep M et al. (2019) The Notijoves Project: Protocol for a Randomized Controlled Trial About New Communication Technologies and Gamification to Promote Partner Notification of Sexually Transmitted Infections Among Young People. JMIR research protocols 8(6): e12896	- Data not reported in an extractable format
Cassell, Jackie A, Dodds, Julie, Estcourt, Claudia et al. (2015) The relative clinical effectiveness and cost-effectiveness of three contrasting approaches to partner notification for curable sexually transmitted infections: a cluster randomised trial in primary care. Health technology assessment (Winchester, England) 19(5): 1-viii	- Data not reported in an extractable format *Study abandoned because too few people were recruited.*
Cavalcante, Elani Graca Ferreira, Galvao, Marli Teresinha Gimeniz, Lima, Ivana Cristina Vieira de et al. (2020) Strategies for notifying sexual partners of people with sexually transmitted infections: a randomized clinical trial. Revista da Escola de Enfermagem da U S P 54: e03648	- Non OECD country
Dalal, Shona, Johnson, Cheryl, Fonner, Virginia et al. (2017) Improving HIV test uptake and case finding with assisted partner notification services. AIDS (London, England) 31(13): 1867-1876	- More recent systematic review included that covers the same topic
Estcourt, Claudia S, Gibbs, Jo, Sutcliffe, Lorna J et al. (2017) The eSexual Health Clinic system for management, prevention, and control of sexually transmitted infections: exploratory studies in people testing for Chlamydia trachomatis. The Lancet. Public health 2(4): e182-e190	- Not a relevant study design *Non-randomised study*

Study	Code [Reason]
Falk, Lars, Hegic, Sabina, Wilson, Daniel et al. (2014) Home-sampling as a tool in the context of Chlamydia trachomatis partner notification: a randomized controlled trial. Acta dermato-venereologica 94(1): 72-4	- Study does not contain outcomes of interest
Free, C., McCarthy, O., French, R.S. et al. (2016) Can text messages increase safer sex behaviours in young people? Intervention development and pilot randomized controlled trial. Health Technology Assessment 20(57): 1-81	- Study does not contain a relevant intervention *Intervention more focused on other elements.* - Does not contain a population of people with XXX *>50% of people did not have a diagnosed STI.*
Free, Caroline, McCarthy, Ona, French, Rebecca S et al. (2016) Can text messages increase safer sex behaviours in young people? Intervention development and pilot randomised controlled trial. Health technology assessment (Winchester, England) 20(57): 1-82	- Does not contain a population of people with XXX *>50% of people did not have a diagnosed STI.* - Study does not contain a relevant intervention *Intervention more focused on other elements.*
Kerani, Roxanne Pieper, Fleming, Mark, DeYoung, Bill et al. (2011) A randomized, controlled trial of inSPOT and patient-delivered partner therapy for gonorrhea and chlamydial infection among men who have sex with men. Sexually transmitted diseases 38(10): 941-6	- Data not reported in an extractable format *Study contains 4 arms, but only 1 intervention arm is relevant to the protocol; study does not report outcomes in control arm, reports results for intervention arms only.*
Low, N, McCarthy, A, Macleod, J et al. (2007) Epidemiological, social, diagnostic and economic evaluation of population screening for genital chlamydial infection. Health technology assessment (Winchester, England) 11(8): iii-165	- Comparator in study does not match that specified in protocol *Interventions too similar*
Low, Nicola, McCarthy, Anne, Roberts, Tracy E et al. (2006) Partner notification of chlamydia infection in primary care: randomised controlled trial and analysis of resource use. BMJ (Clinical research ed.) 332(7532): 14-9	- Secondary publication of an included study that does not provide any additional relevant information
Pellowski, Jennifer, Mathews, Catherine, Kalichman, Moira O et al. (2016) Advancing Partner Notification Through Electronic Communication Technology: A Review of Acceptability and Utilization Research. Journal of health communication 21(6): 629-37	- More recent systematic review included that covers the same topic

Study	Code [Reason]
Trent, Maria, Chung, Shang-en, Burke, Michael et al. (2010) Results of a randomized controlled trial of a brief behavioral intervention for pelvic inflammatory disease in adolescents. Journal of pediatric and adolescent gynecology 23(2): 96-101	- Does not contain a population of people with XXX *Not in a population who were recently diagnosed with an STI; only 51% had ever had an STI.* - Study does not contain a relevant intervention *Intervention is more for behaviour change promoting safe sex and not partner notification. Partner notification is an outcome not an intervention in this study.*
Udeagu, Chi-Chi N, Bocour, Angelica, Shah, Sharmila et al. (2014) Bringing HIV partner services into the age of social media and mobile connectivity. Sexually transmitted diseases 41(10): 631-6	- Not a relevant study design *Prospective cohort study*

K.2 Qualitative studies

Study	Code [Reason]
Adams, O Peter; Carter, Anne O; Redwood-Campbell, Lynda (2015) Understanding attitudes, barriers and challenges in a small island nation to disease and partner notification for HIV and other sexually transmitted infections: a qualitative study. BMC public health 15: 455	- Does not contain a population of people with XXX *Only 3 people interviewed had HIV but they were not newly diagnosed. All other interviewees were professionals.*
Bilardi, J.E., Hulme-Chambers, A., Chen, M.Y. et al. (2019) The role of stigma in the acceptance and disclosure of HIV among recently diagnosed men who have sex with men in Australia: A qualitative study. PLoS ONE 14(11): e0224616	- Study does not report any of the factors of interest specified in the protocol *Focus was on how people dealt with HIV diagnosis, acceptance of diagnosis, disclosing status to friends/family but not partners, and what HIV positive MSM need..*
Bilardi, Jade E, Fairley, Christopher K, Hopkins, Carol A et al. (2010) Let Them Know: evaluation of an online partner notification service for chlamydia that offers E-mail and SMS messaging. Sexually transmitted diseases 37(9): 563-5	- Study does not report any of the factors of interest specified in the protocol *Not a qualitative study on the views of people. It provides an overview of usage statistics*
Clark, Jesse L, Segura, Eddy R, Perez-Brumer, Amaya G et al. (2014) Potential impact and	- Not a relevant study design

Study	Code [Reason]
acceptability of Internet partner notification for men who have sex with men and transgender women recently diagnosed as having sexually transmitted disease in Lima, Peru. Sexually transmitted diseases 41(1): 43-5	*Survey and quantitative association study.*
Coombe, Jacqueline, Goller, Jane, Bittleston, Helen et al. (2020) Sexually transmissible infections, partner notification and intimate relationships: A qualitative study exploring the perspectives of general practitioners and people with a recent chlamydia infection. Sexual Health 17(6): 503-509	- Combined patient and HCP perspectives, cannot be separated
Down, Ian, Wilson, David P, McCann, Pol Dominic et al. (2012) Increasing gay men's testing rates and enhancing partner notification can reduce the incidence of syphilis. Sexual health 9(5): 472-80	- Does not contain a population of people with XXX *Not a population recently diagnosed with an STI.*
Golden, Matthew R, Whittington, William L H, Handsfield, H Hunter et al. (2004) Failure of family-planning referral and high interest in advanced provision emergency contraception among women contacted for STD partner notification. Contraception 69(3): 241-6	- Not a relevant study design *Survey.* - Study does not report any of the factors of interest specified in the protocol *Interviews did not ask about partner notification.*
John, S.A., Starks, T.J., Rendina, H.J. et al. (2019) High willingness to use novel HIV and bacterial sexually transmitted infection partner notification, testing, and treatment strategies among gay and bisexual men. Sexually Transmitted Infections	- Not a relevant study design *Survey.* - Does not contain a population of people with XXX *95% of people were not recently diagnosed with an STI.*
Joshi, B., Kulkarni, R., Chauhan, S. et al. (2009) Perceptions and practices of rural men on RTIs/STIs and their expectations on its management at public healthcare facilities: A qualitative insight. Health and Population: Perspectives and Issues 32(1): 1-11	- Study does not report any of the factors of interest specified in the protocol *Does not have a section of preferred methods of partner notification, only a small section on views on partner notification in general.*
Kerani, Roxanne Pieper; Fleming, Mark; Golden, Matthew Robert (2013) Acceptability and intention to seek medical care after hypothetical receipt of patient-delivered partner therapy or electronic partner notification	- Not a relevant study design *Survey.*

Study	Code [Reason]
postcards among men who have sex with men: the partner's perspective. Sexually transmitted diseases 40(2): 179-85	
Klabbers, Robin E., Muwonge, Timothy R., Ayikobua, Emmanuel et al. (2020) Understanding the role of interpersonal violence in assisted partner notification for HIV: a mixed-methods study in refugee settlements in West Nile Uganda. Journal of global health 10(2): 020440	- Not a relevant study design *Interviewees are HCP with experience of PN*
Klitzman, Robert, Kirshenbaum, Sheri, Kittel, Lauren et al. (2004) Naming Names: Perceptions of Name-Based HIV Reporting, Partner Notification, and Criminalization of Non-disclosure Among Persons Living With HIV. Sexuality Research & Social Policy: A Journal of the NSRC 1(3): 38-57	- Does not contain a population of people with XXX *Population is people with established HIV, not recently diagnosed HIV* - Study does not report any of the factors of interest specified in the protocol *Looks at topics not specifically about partner notification, such as a HIV registry and legal mandatory disclosure of HIV status*
Monroe-Wise, A., Maingi Mutiti, P., Kimani, H. et al. (2019) Assisted partner notification services for patients receiving HIV care and treatment in an HIV clinic in Nairobi, Kenya: a qualitative assessment of barriers and opportunities for scale-up. Journal of the International AIDS Society 22(s3): e25315	- Does not contain a population of people with XXX *Population includes people who have been diagnosed with established HIV, and not people recently diagnosed with HIV*
Nakku-Joloba, Edith, Kiguli, Juliet, Kayemba, Christine Nalwadda et al. (2019) Perspectives on male partner notification and treatment for syphilis among antenatal women and their partners in Kampala and Wakiso districts, Uganda. BMC infectious diseases 19(1): 124	- Study does not report any of the factors of interest specified in the protocol *The study concentrates on whether male partners visit clinics after being notified of possible infection, and the barriers to and facilitators for attending clinic in this context.*
Ricks, J.M., Swartzendruber, A.L., Sales, J.M. et al. (2015) Acceptance of and experiences utilising expedited partner therapy among African-American juvenile girls. Sexual Health 12(4): 364-368	- Does not contain a population of people with XXX *Study in girls detained in juvenile detention centres.*
Shackleton, Thomas; Sutcliffe, Lorna; Estcourt, Claudia (2011) Is Accelerated Partner Therapy partner notification for sexually transmissible infections acceptable and feasible in general practice?. Sexual health 8(1): 17-22	- Does not contain a population of people with XXX *Only GPs and practice nurses were interviewed.*

Study	Code [Reason]
Shamash, Z., Catallozzi, M., Dayan, P.S. et al. (2019) Preferences for Expedited Partner Therapy Among Adolescents in an Urban Pediatric Emergency Department: A Mixed-Methods Study. Pediatric emergency care	- Does not contain a population of people with XXX *Most participants had not recently or ever been diagnosed with an STI. Synthesis was done so both groups (diagnosed and not diagnosed) were analysed together.*
Shoveller, Jean, Knight, Rod, Davis, Wendy et al. (2012) Online sexual health services: examining youth's perspectives. Canadian journal of public health = Revue canadienne de sante publique 103(1): 14-8	- Does not contain a population of people with XXX *Participants' STI/HIV status was not disclosed, but unlikely to include significant proportion of people recently diagnosed with an STI.*
Tan, Wei Sheng, Chen, Marcus, Ivan, Mihaela et al. (2016) Partner Notification Outcomes for Men Who Have Sex With Men Diagnosed With Syphilis Referred to Partner Notification Officers, Melbourne, Australia. Sexually transmitted diseases 43(11): 685-689	- Does not contain a population of people with XXX *Only healthcare professionals were interviewed; no qualitatively data relevant to the population.*
Temkin, Elizabeth, Klassen, Ann C, Mmari, Kristin et al. (2011) A qualitative study of patients' use of expedited partner therapy. Sexually transmitted diseases 38(7): 651-6	- Study does not report any of the factors of interest specified in the protocol *Participants were asked views on EPT only*
Temple-Smith, Meredith, Hopkins, Carol, Fairley, Christopher et al. (2010) The right thing to do: patients' views and experiences of telling partners about chlamydia. Family practice 27(4): 418-23	- Study does not report any of the factors of interest specified in the protocol *Participants were asked views on EPT only*
van Rooijen, Martijn S, Gotz, Hannelore, Vriens, Pjer et al. (2018) Sender and Receiver Acceptability and Usability of an Online Partner Notification Tool for Sexually Transmitted Infection in the Netherlands. Sexually transmitted diseases 45(5): 354-357	- Not a relevant study design *Survey.*
Vermandere, Heleen, Aguilera-Mijares, Santiago, Martinez-Vargas, Liliane et al. (2021) Developing HIV assisted partner notification services tailored to Mexican key populations: a qualitative approach. BMC public health 21(1): 555	- Combined patient and HCP perspectives, cannot be separated
Wysocki, S. and Woodward, J.A. (2010) Expedited partner therapy for chlamydia: A Q&A session. Women's Health Care 9(5)	- Full text paper not available

Study	Code [Reason]
Zhang, K., Zhao, J., Li, X. et al. (2019) Perceived Facilitators and Barriers regarding Partner Notification in People Living With HIV in Hunan, China: A Qualitative Study From the Patient Perspective. The Journal of the Association of Nurses in AIDS Care : JANAC 30(6): 658-667	- Does not contain a population of people with XXX *Population is people with established HIV, not people recently diagnosed with HIV*

K.3 Economic studies

Study	Reason for exclusion
Althaus, Christian L, Turner, Katherine M E, Mercer, Catherine H et al. (2014) Effectiveness and cost-effectiveness of traditional and new partner notification technologies for curable sexually transmitted infections: observational study, systematic reviews and mathematical modelling. Health technology assessment (Winchester, England) 18(2): 1-viii	- Does not include a cost-utility analysis of partner notification *[Outcome of the analysis is cost per individual tested, rather than cost per QALY]*
Cassell, Jackie A, Dodds, Julie, Estcourt, Claudia et al. (2015) The relative clinical effectiveness and cost-effectiveness of three contrasting approaches to partner notification for curable sexually transmitted infections: a cluster randomised trial in primary care. Health technology assessment (Winchester, England) 19(5): 1-viii	- Within RCT cost-utility analysis not possible because the trial was terminated early due to difficulties with recruitment
Cohen D A, Wu S Y, Farley T A (2004) Comparing the cost-effectiveness of HIV prevention interventions. Journal of Acquired Immune Deficiency Syndromes 37(3): 1404-1414	- Does not include a cost-utility analysis of partner notification *[Outcome of the analysis is cost per case of HIV prevented, rather than cost per QALY]*
Deogan, Charlotte L, Bocangel, Marta K Hansson, Wamala, Sarah P et al. (2010) A cost-effectiveness analysis of the Chlamydia Monday--a community-based intervention to decrease the prevalence of chlamydia in Sweden. Scandinavian journal of public health 38(2): 141-50	- Intervention contains a broader range of components than partner notification
Gift, Thomas L, Kissinger, Patricia, Mohammed, Hamish et al. (2011) The cost and cost-effectiveness of expedited partner therapy compared with standard partner referral for the treatment of chlamydia or gonorrhea. Sexually transmitted diseases 38(11): 1067-73	- Does not include a cost-utility analysis of partner notification

Study	Reason for exclusion
Gillespie, Paddy, O'Neill, Ciaran, Adams, Elisabeth et al. (2012) The cost and cost-effectiveness of opportunistic screening for Chlamydia trachomatis in Ireland. Sexually transmitted infections 88(3): 222-8	- Intervention contains a broader range of components than partner notification
Howell MR; Kassler WJ; Haddix A (1997) Partner notification to prevent pelvic inflammatory disease in women. Cost-effectiveness of two strategies. Sexually transmitted diseases 24(5): 287-292	- Does not include a cost-utility analysis of partner notification *[Outcome of the analysis is cost per case of pelvic inflammatory disease prevented, rather than cost per QALY]*
Kao, Szu-Yu Zoe and Enns, Eva A (2020) Follow the Sex: Influence of Network Structure on the Effectiveness and Cost-Effectiveness of Partner Management Strategies for Sexually Transmitted Infection Control. Sexually transmitted diseases 47(2): 71-79	- Does not include a cost-utility analysis of partner notification *[Outcome of the analysis is cost per infected person-month prevented, rather than cost per QALY]*
Li, Xinqi C, Kusi, Lillian, Marak, Theodore et al. (2018) The Cost and Cost-utility of Three Public Health HIV Case-finding Strategies: Evidence from Rhode Island, 2012-2014. AIDS and behavior 22(11): 3726-3733	- Does not include a cost-utility analysis of partner notification *[Outcome of the analysis is cost per case of HIV prevented, rather than cost per QALY]*
Looker, Katharine J; Wallace, Lesley A; Turner, Katherine M E (2015) Impact and cost-effectiveness of chlamydia testing in Scotland: a mathematical modelling study. Theoretical biology & medical modelling 12: 2	- Intervention contains a broader range of components than partner notification
Low, N, McCarthy, A, Macleod, J et al. (2007) Epidemiological, social, diagnostic and economic evaluation of population screening for genital chlamydial infection. Health technology assessment (Winchester, England) 11(8): iii-165	- Intervention contains a broader range of components than partner notification
Low, Nicola, McCarthy, Anne, Roberts, Tracy E et al. (2006) Partner notification of chlamydia infection in primary care: randomised controlled trial and analysis of resource use. BMJ (Clinical research ed.) 332(7532): 14-9	- Does not include a cost-utility analysis of partner notification *[Study only reports costs and numbers of partners referred]*
Nevin, Remington L, Shuping, Eric E, Frick, Kevin D et al. (2008) Cost and effectiveness of Chlamydia screening among male military recruits: Markov modeling of complications averted through notification of prior female partners. Sexually transmitted diseases 35(8): 705-13	- Intervention contains a broader range of components than partner notification

Study	Reason for exclusion
Rahman, Mohammad M; Khan, Mahmud; Gruber, DeAnn (2015) A Low-Cost Partner Notification Strategy for the Control of Sexually Transmitted Diseases: A Case Study From Louisiana. American journal of public health 105(8): 1675-80	- Intervention contains a broader range of components than partner notification
Roberts, Tracy E, Tsourapas, Angelos, Sutcliffe, Lorna et al. (2012) Is Accelerated Partner Therapy (APT) a cost-effective alternative to routine patient referral partner notification in the UK? Preliminary cost-consequence analysis of an exploratory trial. Sexually transmitted infections 88(1): 16-20	- Does not include a cost-utility analysis of partner notification *[Outcome of the analysis is cost per partner treated, rather than cost per QALY]*
Rutstein, Sarah E, Brown, Lillian B, Biddle, Andrea K et al. (2014) Cost-effectiveness of provider-based HIV partner notification in urban Malawi. Health policy and planning 29(1): 115-26	- Study conducted in a non-OECD country
Sharma, Monisha, Smith, Jennifer A, Farquhar, Carey et al. (2018) Assisted partner notification services are cost-effective for decreasing HIV burden in western Kenya. AIDS (London, England) 32(2): 233-241	- Study conducted in a non-OECD country
Turner, Katy, Adams, Elisabeth, Grant, Arabella et al. (2011) Costs and cost effectiveness of different strategies for chlamydia screening and partner notification: an economic and mathematical modelling study. BMJ (Clinical research ed.) 342: c7250	- Does not include a cost-utility analysis of partner notification *[Outcome of the analysis is cost per partner treated, rather than cost per QALY]*