National Institute for Health and Care Excellence

Final

Reducing sexually transmitted infections (STIs)

[D] Effective and cost-effective interventions to increase frequent STI testing in very high risk groups

NICE guideline NG221

Evidence reviews underpinning a research recommendation in the NICE guideline

June 2022

Final

National Institute for Health and Care Excellence

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The recommendations in this guideline represent the view of NICE, arrived at after careful consideration of the evidence available. When exercising their judgement, professionals are expected to take this guideline fully into account, alongside the individual needs, preferences and values of their patients or service users. The recommendations in this guideline are not mandatory and the guideline does not override the responsibility of healthcare professionals to make decisions appropriate to the circumstances of the individual patient, in consultation with the patient and/or their carer or guardian.

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Contents

1 Interventions to increase frequent STI testing in very high-risk groups

1.1 Review question

What interventions are effective and cost effective at increasing frequent STI testing in very high-risk groups?

1.1.1 Introduction

Sexually transmitted infections (STIs) includes a range of clinical syndromes that can be acquired and transmitted through sexual activity and may be caused by various types of pathogens, including bacteria, fungi, viruses, and parasites. It can affect personal wellbeing, mental health and relationships and can also lead to serious health problems including pelvic inflammatory disease, ectopic pregnancy or infertility. Increasing the frequency of testing, especially among people at very high-risk of infection can help to reduce transmission of STIs

1.1.2 Summary of the protocol

Table 1: Summary of protocol

Eligibility criteria	Content
Population	People from age 16 at very high risk of STIs requiring 3 monthly testing: - commercial sex workers - people with multiple sex partners (>10 partners within 3 months) - People engaging in so-called chemsex - gay, bisexual and other men who have sex with men (MSM) previously diagnosed with a bacterial STI (in the last year)
Interventions	Interventions or strategies that have a stated primary aim of increasing the rate of 3 monthly STI testing in very high risk groups, including but not limited to: **Interventions delivered in healthcare settings:** • Emails or text messages from healthcare providers with invites for testing or testing reminders • Mobile or digital e-health reminder approaches from healthcare providers • Testing in spoke or satellite clinics • Changes in service provision and delivery that may improve access to sexual health services and testing accessibility such as reduced waiting times, extended clinic opening hours, short notice appointments, appointment booking systems. whether services meet 'You're Welcome' youth friendly criteria **Interventions delivered in non-healthcare settings:** • Testing services delivered in non-clinical community settings such as voluntary or community organisations • Testing services delivered in outreach settings such as bars, clubs, faith-based settings, saunas, sex on premises venues • Online testing services • STI self-sampling and/or self-testing kits

Eligibility criteria	Content
	Excluded: • Interventions where the primary objective is not specifically to increase the frequency of STI testing in the specified groups • Interventions designed to improve the frequency of HIV testing, Hepatitis A or Hepatitis B • Interventions designed to improve the uptake of STI vaccinations (e.g. HPV, Hepatitis A and Hepatitis B vaccinations). • Interventions relating to partner notification strategies. • Condom distribution schemes. • Clinical interventions for the diagnosis, treatment or management of STIs. • Interventions delivered in schools.
Comparator	• Another intervention • No intervention
Outcomes	• Frequency of STI testing and re-testing • STI re-infection rates • Proportion of people in very high risk groups receiving STI testing at least once every 3 months • Safety or adverse effects • Unintended consequences (e.g. availability of STI testing appointments, waiting time for diagnosis and/or treatment) • Awareness of STI testing and testing services • The number of people at risk who intend to have an STI test • Condom use • Changing STI diagnosis rate
Study types	• RCTs • Cluster RCTs • Systematic reviews of included study designs

For full protocol see Appendix A.

1.1.3 Methods and process

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

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

1.1.4 Effectiveness evidence

3197 references were identified from this literature search (See Appendix B for full details of search). 25 papers were ordered in full-text. Of these, no papers met the inclusion criteria for the effectiveness review as outlined in the review protocol.

1.1.4.1 Included studies

No studies were included in this review.

1.1.4.2 Excluded studies

For details of excluded studies and reason for exclusion, see Appendix I.

1.1.5 Summary of studies included in the effectiveness evidence

No studies were included in this review.

1.1.6 Summary of the effectiveness evidence

No studies were included in this review.

1.1.7 Economic evidence

A search for relevant economic studies was undertaken, using the strategy in appendix B and applying a cost-effectiveness filter. 1,275 references were identified from this literature search; of which 1,274 were excluded during title and abstract screening. The one study included at title and abstract screening was then excluded after examination of the full text of the article.

1.1.7.1 Included studies

No economic evidence was included for this review question.

1.1.7.2 Excluded studies

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

1.1.8 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 in the absence of evidence of clinical effectiveness, the committee agreed there would be limited value in any such modelling undertaken.

1.1.9 The committee's discussion and interpretation of the evidence

1.1.9.1 The outcomes that matter most

The committee agreed that the key outcomes in this area were rates of testing among very high risk groups, and proportion of very high risk groups who undertook testing. They agreed that the re-testing rate was also very important since people who continue to be at very high risk need to test regularly, ideally every 3 months.

1.1.9.2 The quality of the evidence

No evidence was identified for interventions specifically aimed at the groups included in the protocol:

- commercial sex workers
- people with multiple sex partners (>10 partners within 3 months)
- people engaging in so-called chemsex
- gay, bisexual and other men who have sex with men previously diagnosed with a bacterial STI (in the last year)

There were no RCT studies that met the protocol and no suitable uncontrolled studies were found. The committee were disappointed with the lack of evidence but noted that they were aware that research is building in this area. The option of using expert witness testimony was not explored as the committee found it acceptable to proceed using the evidence presented in review C combined with their own experiences of very high risk groups instead.

Given the lack of evidence, the committee did not feel that it was possible to directly extrapolate the data from other groups to the very high-risk groups identified for this review, as people in these groups represent a very small minority with distinct challenges. In spite of that the committee agreed that recommendations made on the basis of more general interventions to increase the uptake and frequency of testing would have some impact on these groups too, despite not sufficiently addressing their circumstances. The committee noted that stigma around sexual behaviour was a common concern found in the qualitative evidence reviewed in RQ2.2, and inferred that this was likely to be a key driver in people from very high-risk groups not accessing services. The committee agreed to make a research recommendation to explore what sexual health services can do to reduce stigma (see appendix J). They note this complemented other research recommendations, for example about delivering sexual health services within other services. They also agreed that outreach was likely to be effective in reaching some of these groups and they noted that they had made a research recommendation about this in review B to investigate how outreach could best be tailored to specific groups.

1.1.9.3 Benefits and harms

The committee agreed that recommendations they had made previously about monitoring uptake of kits and about tailoring interventions to particular communities may help to increase access for people in the groups identified for this review. They noted that many services already have some tailored services, for example for sex-workers or for people who participate in so-called chemsex. They also noted that getting people into services for STI testing also gave an opportunity for HIV testing, partner notification, PrEP (if appropriate) and other services, so it wasn't simply an STI test.

1.1.9.4 Cost effectiveness and resource use

The committee agreed that the economic modelling undertaken for this guideline shows that cost-effectiveness is dependent on population prevalence of STIs, this means that any intervention that is cost-effective in the general population is likely to be more cost-effective in a very high-risk population where rates of STIs are higher, assuming the costs and relative effectiveness of the interventions ins similar in the high-risk population. They noted that in the absence of evidence, and to avoid disadvantaging high-risk groups, it was appropriate to extrapolate this evidence to these populations. They also noted that for the interventions recommended in the guideline (self-sampling, tailoring interventions and increasing accessibility there was no a priori reason to assume they would be less effective in high-risk populations.

1.1.10 Recommendations supported by this evidence review

A research recommendation was made on methods to reduce the stigma associated with accessing sexual health services.

1.1.11 References – included studies

1.1.11.1 Effectiveness

No included effectiveness studies.

1.1.11.2 Economic

No economic studies were included in this review.

Appendices

Appendix A – Review protocols

Review protocol for increasing STI testing in very high-risk groups

ID	Field	Content
0.	PROSPERO registration number	CRD42021243652
1.	Review title	Effective and cost-effective interventions to increase frequent STI testing in very high-risk groups
2.	Review question	What interventions are effective and cost effective at increasing frequent STI testing in very high-risk groups?
3.	Objective	STI testing, diagnosis and treatment are central to STI prevention strategies. The purpose of this review is to establish effective and cost-effective strategies or interventions for increasing 3 monthly STI testing in very high risk groups.
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 5 key websites will be searched for relevant reports or publications Database functionality will be used, where available, to exclude: • Non-English language papers • Animal studies • Editorials, letters or commentaries • Conference abstracts or posters • Dissertations or theses • Duplicates Sources will be searched from 2010 to current. The searches will be re-run 6 weeks before final submission of the review and further studies retrieved for inclusion.

ID	Field	Content
		The guidance Information Services team at NICE will quality assure the principal search strategy and peer review the strategies for the other databases. Any revisions or additional steps will be agreed by the review team before being implemented. Any deviations and a rationale for them will be recorded alongside the search strategies. A record will be kept of number of records found from each database and of the strategy used in each database. A record will be kept of total number of duplicates found and of total results provided to the Public Health team.
5.	Condition or domain being studied	Sexually transmitted infections including HIV, genital herpes, chlamydia, genital warts, gonorrhoea, syphilis, *Mycoplasma genitalium, Lymphogranuloma venereum* (LGV), *Trichomonas vaginalis* (TV)
6.	Population	People from age 16 at very high risk of STIs requiring 3 monthly testing: - commercial sex workers - people with multiple sex partners (>10 partners within 3 months) - People engaging in so-called chemsex

ID	Field	Content
		- gay, bisexual and other men who have sex with men (MSM) previously diagnosed with a bacterial STI (in the last year)
7.	Intervention/Exposure/Test	Interventions or strategies that have a stated primary aim of increasing the rate of 3 monthly STI testing in very high risk groups, including but not limited to: **Interventions delivered in healthcare settings:** • Emails or text messages from healthcare providers with invites for testing or testing reminders • Mobile or digital e-health reminder approaches from healthcare providers • Testing in spoke or satellite clinics • Changes in service provision and delivery that may improve access to sexual health services and testing accessibility such as reduced waiting times, extended clinic opening hours, short notice appointments, appointment booking systems. whether services meet 'You're Welcome' youth friendly criteria

ID	Field	Content
		Interventions delivered in non-healthcare settings: • Testing services delivered in non-clinical community settings such as voluntary or community organisations • Testing services delivered in outreach settings such as bars, clubs, faith-based settings, saunas, sex on premises venues • Online testing services • STI self-sampling and/or self-testing kits Excluded: Interventions where the primary objective is not specifically to increase the frequency of STI testing in the specified groups Interventions designed to improve the frequency of HIV testing, Hepatitis A or Hepatitis B Interventions designed to improve the uptake of STI vaccinations (e.g. HPV, Hepatitis A and Hepatitis B vaccinations). Interventions relating to partner notification strategies.

ID	Field	Content
		Condom distribution schemes. Clinical interventions for the diagnosis, treatment or management of STIs. Interventions delivered in schools.
8.	Comparator/Reference standard/Confounding factors	• Another intervention • No intervention
9.	Types of study to be included	Inclusion: <u>Effectiveness studies:</u> • RCTs • Cluster RCTs • Systematic reviews of included study designs Exclusion (if sufficient RCT evidence): • Controlled before and after studies • Cohort studies

ID	Field	Content
		• Case control studies • Cross-sectional studies • Correlational studies
10.	Other exclusion criteria	Only papers published in the English language will be included Only full published peer-reviewed studies (not protocols or summaries) will be included. Dissertations or theses will be excluded. Only studies carried out in the UK will be included for healthcare setting interventions. Only studies carried out in OECD countries will be included for non-healthcare setting interventions.
11.	Context	The Department of Health and Social Care in England has asked NICE to update the guideline on sexually transmitted infections and under-18 conceptions: prevention (PH3), published in 2007. Changes in policy and commissioning, financial pressures and new evidence identified through the surveillance process led to the decision to update this guideline. The updated guideline will focus solely on the reduction of sexually transmitted infections (STIs), as prevention of under-18 conceptions is covered in other guidelines. Data from Public Health England show the overall number of STI diagnoses increased by 5% between 2018 and 2019. STIs can affect personal wellbeing, mental health and relationships and can also lead to serious health problems including pelvic inflammatory disease, ectopic pregnancy or infertility. It is therefore important to address interventions to help prevent or reduce STIs.

ID	Field	Content
12.	Primary outcomes (critical outcomes)	• Frequency of STI testing and re-testing • STI re-infection rates • Proportion of people in very high risk groups receiving STI testing at least once every 3 months
13.	Secondary outcomes (important outcomes)	• Safety or adverse effects • Unintended consequences (e.g. availability of STI testing appointments, waiting time for diagnosis and/or treatment) • Awareness of STI testing and testing services • The number of people at risk who intend to have an STI test • Condom use • Changing STI diagnosis rate
14.	Data extraction (selection and coding)	All references identified by the searches and from other sources will be uploaded into EPPI reviewer and de-duplicated. This review will not use the EPPI reviewer priority screening functionality because it will not be effective in identifying the different subgroups or intervention types (e.g. evidence for a particular subgroup may be deprioritised by the algorithm in favour of other groups identified early in the screening, which could lead to evidence being missed unless the whole search result is sifted).

ID	Field	Content
		All records will be screened on title and abstract. 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). Information in interventions will be extracted using the TIDieR checklist. The additional checks that are used to ensure that relevant records are not missed will be applied. These include checking reference lists of included systematic reviews (even if these are not used as a primary source of data) and checking with the PHAC that they are not aware of any relevant studies that have been missed.
15.	Methodological (quality) assessment	Risk of bias for individual studies will be assessed using the appropriate checklist as described in Developing NICE guidelines: the manual
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.

ID	Field	Content
		It is anticipated that meta-analysed studies will be heterogeneous. Where appropriate, heterogeneity will be explored by conducting subgroup analyses and incorporated by performing random-effect analyses. If studies are found to be too heterogeneous to be pooled statistically, a narrative approach with sufficient information to make judgements about study effectiveness will be conducted. Tables and other forms of visual presentation will be used to summarise data where appropriate. Dichotomous data will be pooled where appropriate and the effect size will be reported using risk ratios in a standard pair-wise meta-analysis. Continuous outcomes reported on the same scale will be pooled in a standard pair-wise meta-analysis using mean difference where possible. Continuous outcomes not reported on the same scale will be pooled using a standardised mean difference in a standard pair-wise meta-analysis. The quality or certainty across all available evidence will be evaluated for each outcome using an the ‘Grading of Recommendations Assessment, Development and Evaluation (GRADE) toolbox’ developed by the international GRADE working group http://www.gradeworkinggroup.org/

ID	Field	Content
17.	Analysis of sub-groups	Where evidence allows, sub-group analysis will be conducted to include those disproportionately burdened with STIs, including: • 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 age 65 and over • People with low socioeconomic status • People with learning disabilities • Migrant communities

Appendix B – Literature search strategies

For full details of databases searched and strategies used, see the search document on the webpage for this guideline.

Database name: MEDLINE

Ovid MEDLINE(R) 1996 to March 11, 2021

1	Herpes Genitalis/ or Herpes Simplex/	9315
2	((genital* or simplex*) adj3 herpes*).ti,ab.	23018
3	chlamydia*.ti,ab.	18258
4	Chlamydia Infections/ or Chlamydia/ or Chlamydia trachomatis/	12954
5	((genital* or anogenital* or ano-genital* or venereal*) adj3 wart*).ti,ab.	2262
6	Condylomata Acuminata/	2666
7	"condylomata acuminata".ti,ab.	362
8	Gonorrhea/	5249
9	(Gonorrhea* or Gonorrhoea*).ti,ab.	8854
10	Syphilis/	6668
11	syphilis*.ti,ab.	10041
12	(lymphogranuloma venereum or lgv).ti,ab.	600
13	Lymphogranuloma Venereum/	545
14	Trichomonas vaginalis/	2002
15	(trichomonas vaginali* or Trichomoniasi*).ti,ab.	3429
16	Trichomonas Infections/	934
17	(mycoplasma genitalium or Mgen).ti,ab.	1170
18	Mycoplasma genitalium/	789
19	HIV Infections/ or HIV/	182745
20	(hiv or human Immunodeficiency Virus*).ti,ab.	255357

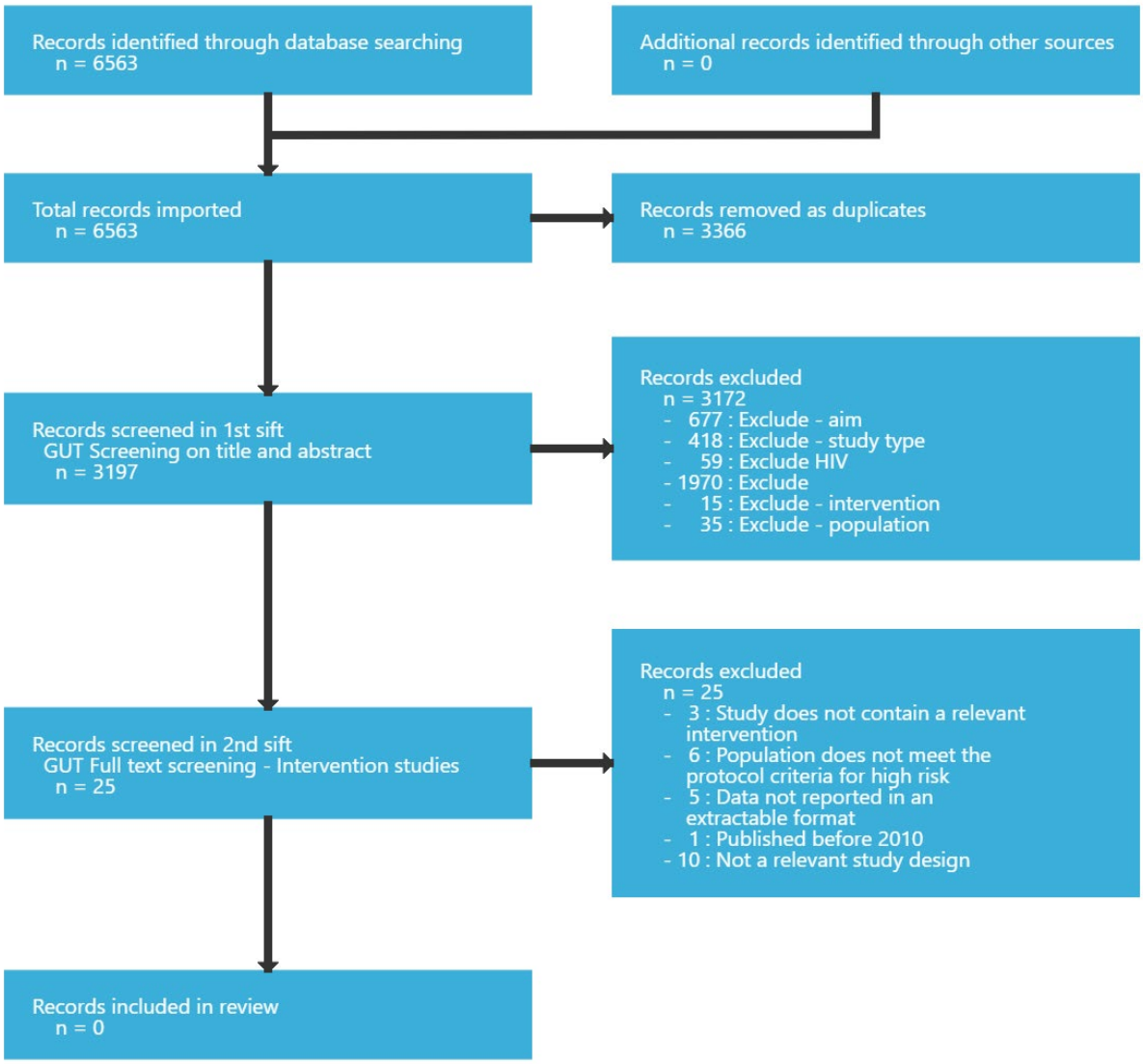
21	Sexually Transmitted Diseases/	15888
22	((sexually adj2 transmit* adj2 (disease* or infection*)) or sti or std).ti,ab.	28972
23	(venereal* adj2 (disease* or infection*)).ti,ab.	896
24	Papillomavirus Infections/	26172
25	(papillomavirus adj (human* or infect*)).ti,ab.	3056
26	hpv.ti,ab.	33198
27	or/1-26	378437
28	((test or tests or testing or tested or screen*) adj4 (attend* or reattend* or re-attend* or recall* or remind* or repeat* or retest* or re-test* or alert* or ongoing* or regular* or routine* or interval* or month* or week* or year*)).ti,ab.	132091
29	((test or tests or testing or tested or screen*) adj4 frequen*).ti,ab.	14205
30	((test or tests or testing or tested or screen*) adj4 (participat* or detection)).ti,ab.	28189
31	((test or tests or testing or tested or screen*) adj4 ((service* or setting*) adj4 (provision* or deliver* or remote* or outreach* or online or communit* or voluntary* or non-clinical or non clinical))).ti,ab.	1059
32	((test or tests or testing or tested or screen*) adj4 (pub or pubs or nightclub* or bar* or club* or "social event*" or "social venue*" or sauna* or brothel* or (sex* adj2 (venue* or premise* or club*)) or ((faith or religious) adj2 setting*))).ti,ab.	8131
33	((test or tests or testing or tested or screen*) adj4 (satellite* or remote* or video consult* or telephone consult* or phone consult* or skype* or zoom* or "youre welcome" or "GP at Hand" or "Push Doctor" or "Dr Thom" or kit* or home* or self)).ti,ab.	20504
34	((test or tests or testing or tested or screen*) adj4 (spoke adj4 (clinic* or provision or approach* or model*))).ti,ab.	1
35	((test or tests or testing or tested or screen*) adj4 ("hub and spoke" or "hub-and-spoke")).ti,ab.	5
36	((test or tests or testing or tested or screen) adj4 (access* or wait* time* or open* hour* or appointment* or book* system*)).ti,ab.	4219
37	((test or tests or testing or tested or screen*) adj4 (pub or pubs or nightclub* or bar* or club* or "social event*" or "social venue*" or sauna* or brothel* or (sex* adj2 (venue* or premise*)) or ((faith or religious) adj2 setting*))).ti,ab.	8131
38	Diagnostic Tests, Routine/ or "Direct-To-Consumer Screening and Testing"/	11023
39	or/28-38	205855
40	(sex work* or prostitut* or transaction* sex or commercial sex or escort* or "commuter housewife" or "commuter housewives" or "gay for pay").ti,ab.	8399

41	(hooker* or call girl* or gigolo* or gigalo* or hustler* or working girl* or streetwalker* or "street walker*").ti,ab.	350
42	((Sell* or paid*) adj4 sex*).ti,ab.	610
43	Sex Workers/ or Sex Work/	6109
44	40 or 41 or 42 or 43	10298
45	((Multiple* or many or numerous or "more than 10" or "more than ten" or "10 or more" or "ten or more" or 10+ or 10 plus) adj3 Sex* adj3 Partner*).ti,ab.	2252
46	Sexual Partners/	16243
47	45 or 46	17704
48	(chemsex* or "chem* sex*" or "chemical sex*" or chemfun or "chem fun" or "party and play" or PNP or slamsex* or "slam* sex*").ti,ab.	3277
49	((GHB or Gamma-hydroxybutyrate or GBL or gamma-butyrolactone or mephedrone or methylmethcathinone or "crystal meth" or methamphetamine or meph or meaw or "miaow miaow" or MCAT or drug use* or drug abuse* or drug misuse* or psychoactive*) adj4 sex*).ti,ab.	3271
50	(Methamphetamine/ or Illicit Drugs/ or Substance-Related Disorders/) and Sexual Behavior/	2715
51	48 or 49 or 50	8583
52	gay*.ti,ab.	8883
53	Homosexuality, Male/	15790
54	"Sexual and Gender Minorities"/	4526
55	Bisexuality/	3707
56	Transgender Persons/ or Transsexualism/ or Transgender/ or Health Services for Transgender Persons/	5792
57	Homosexuality/	3307
58	men who have sex with men.ti,ab.	10081
59	(same sex or non heterosexual* or non-heterosexual*).ti,ab.	5101
60	MSM.ti,ab.	8817
61	(transgend* or transex* or transsex* or transma* or transmen* or trans man or trans men or trans masculine or transfem* or transwom* or trans woman or trans women or transperson* or transpeopl* or trans person* or trans people* or (gender adj (queer* or fluid* or variant*)) or nonbinary or non binary or non-binary or genderless or genderqueer* or agender or bi-gender or bi gender or neutrois or crossgender* or cross-gender* or crossex* or cross-sex*).ti,ab.	12363

62	(bisexual* or homosexual* or lgbt*).ti,ab.	11707
63	or/52-62	44600
64	44 or 47 or 51 or 63	71791
65	27 and 39 and 64	2972
66	afghanistan/ or africa/ or africa, northern/ or africa, central/ or africa, eastern/ or "africa south of the sahara"/ or africa, southern/ or africa, western/ or albania/ or algeria/ or andorra/ or angola/ or "antigua and barbuda"/ or argentina/ or armenia/ or azerbaijan/ or bahamas/ or bahrain/ or bangladesh/ or barbados/ or belize/ or benin/ or bhutan/ or bolivia/ or borneo/ or "bosnia and herzegovina"/ or botswana/ or brazil/ or brunei/ or bulgaria/ or burkina faso/ or burundi/ or cabo verde/ or cambodia/ or cameroon/ or central african republic/ or chad/ or exp china/ or comoros/ or congo/ or cote d'ivoire/ or croatia/ or cuba/ or "democratic republic of the congo"/ or cyprus/ or djibouti/ or dominica/ or dominican republic/ or ecuador/ or egypt/ or el salvador/ or equatorial guinea/ or eritrea/ or eswatini/ or ethiopia/ or fiji/ or gabon/ or gambia/ or "georgia (republic)"/ or ghana/ or grenada/ or guatemala/ or guinea/ or guinea-bissau/ or guyana/ or haiti/ or honduras/ or independent state of samoa/ or exp india/ or indian ocean islands/ or indochina/ or indonesia/ or iran/ or iraq/ or jamaica/ or jordan/ or kazakhstan/ or kenya/ or kosovo/ or kuwait/ or kyrgyzstan/ or laos/ or lebanon/ or liechtenstein/ or lesotho/ or liberia/ or libya/ or madagascar/ or malaysia/ or malawi/ or mali/ or malta/ or mauritania/ or mauritius/ or mekong valley/ or melanesia/ or micronesia/ or monaco/ or mongolia/ or montenegro/ or morocco/ or mozambique/ or myanmar/ or namibia/ or nepal/ or nicaragua/ or niger/ or nigeria/ or oman/ or pakistan/ or palau/ or exp panama/ or papua new guinea/ or paraguay/ or peru/ or philippines/ or qatar/ or "republic of belarus"/ or "republic of north macedonia"/ or romania/ or exp russia/ or rwanda/ or "saint kitts and nevis"/ or saint lucia/ or "saint vincent and the grenadines"/ or "sao tome and principe"/ or saudi arabia/ or serbia/ or sierra leone/ or senegal/ or seychelles/ or singapore/ or somalia/ or south africa/ or south sudan/ or sri lanka/ or sudan/ or suriname/ or syria/ or taiwan/ or tajikistan/ or tanzania/ or thailand/ or timor-leste/ or togo/ or tonga/ or "trinidad and tobago"/ or tunisia/ or turkmenistan/ or uganda/ or ukraine/ or united arab emirates/ or uruguay/ or uzbekistan/ or vanuatu/ or venezuela/ or vietnam/ or west indies/ or yemen/ or zambia/ or zimbabwe/	858570
67	"organisation for economic co-operation and development"/	308
68	australasia/ or exp australia/ or austria/ or baltic states/ or belgium/ or exp canada/ or chile/ or colombia/ or costa rica/ or czech republic/ or exp denmark/ or estonia/ or europe/ or finland/ or exp france/ or exp germany/ or greece/ or hungary/ or iceland/ or ireland/ or israel/ or exp italy/ or exp japan/ or korea/ or latvia/ or lithuania/ or luxembourg/ or mexico/ or netherlands/ or new zealand/ or north america/ or exp norway/ or poland/ or portugal/ or exp "republic of korea"/ or "scandinavian and nordic countries"/ or slovakia/ or slovenia/ or spain/ or sweden/ or switzerland/ or turkey/ or exp united kingdom/ or exp united states/	2240109
69	european union/	14314
70	developed countries/	8838
71	or/67-70	2252699
72	66 not 71	800688
73	65 not 72	2015
74	Animals/ not (Humans/ and Animals/)	2578947
75	73 not 74	2014

76	limit 75 to yr="2009 -Current"	1572
77	limit 76 to english language	1522
78	limit 77 to (letter or historical article or comment or editorial or news or case reports)	45
79	77 not 78	1477

Appendix C – Effectiveness evidence study selection



Appendix D – Effectiveness evidence

No studies were included in this review.

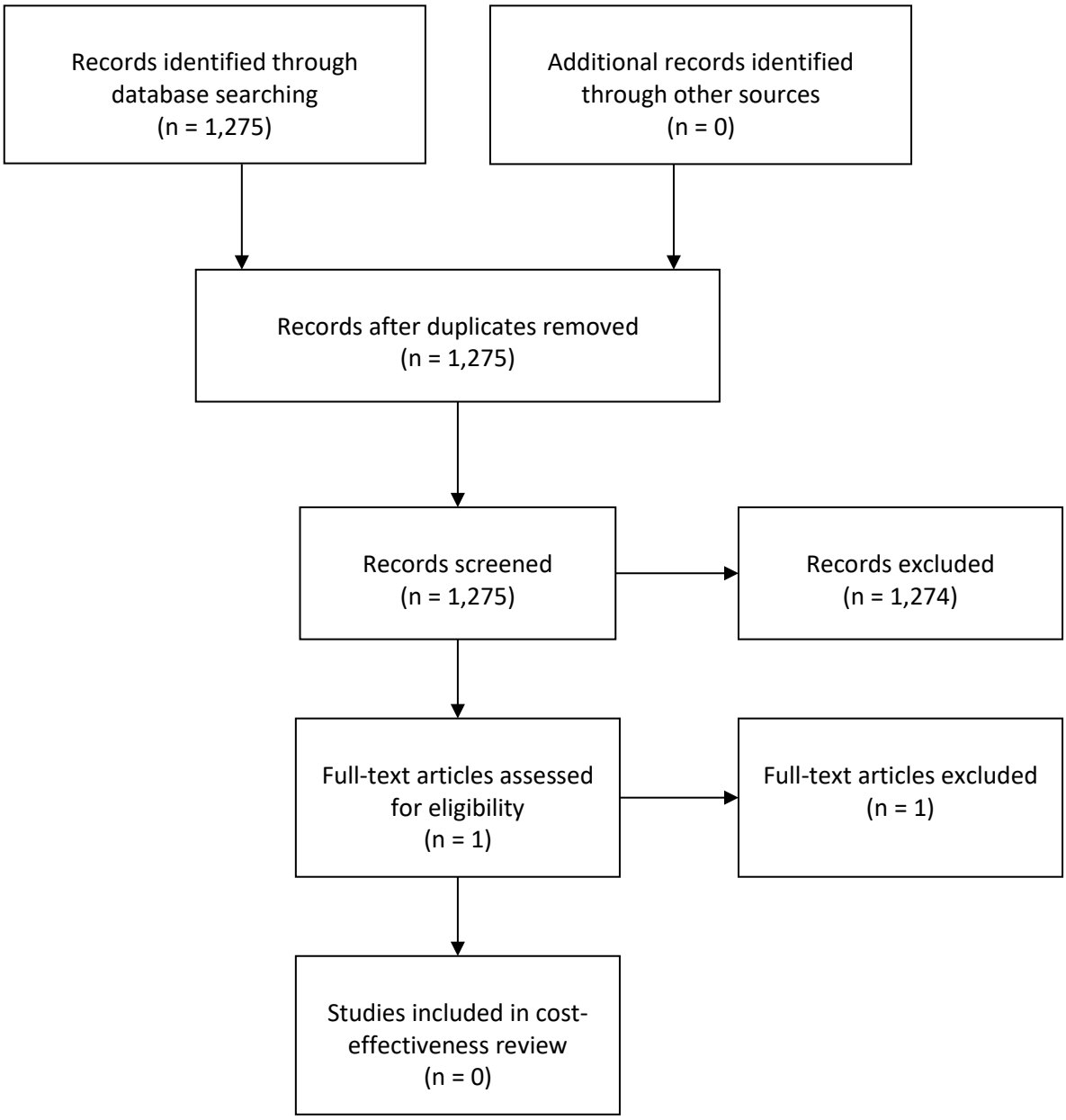
Appendix E – Forest plots

No studies were included in this review.

Appendix F – GRADE tables

No studies were included in this review.

Appendix G – Economic evidence study selection



Appendix H – Economic evidence tables

No economic evidence was identified for this review question.

Appendix I – Health economic model

No health economic modelling was undertaken for this review question.

Appendix J – Excluded studies

Clinical review

Study	Code [Reason]
Balan, Ivan C, Rios, Javier Lopez, Lentz, Cody et al. (2021) Acceptability and Use of a Dual HIV/Syphilis Rapid Test and Accompanying Smartphone App to Facilitate Self- and Partner-Testing Among Cisgender Men and Transgender Women Who Have Sex with Men. AIDS and behavior	- Population does not meet the protocol criteria for high risk
Bissessor, Melanie, Fairley, Christopher K, Leslie, David et al. (2011) Use of a computer alert increases detection of early, asymptomatic syphilis among higher-risk men who have sex with men. Clinical infectious diseases : an official publication of the Infectious Diseases Society of America 53(1): 57-8	- Population does not meet the protocol criteria for high risk
Bourne, C, Knight, V, Guy, R et al. (2011) Short message service reminder intervention doubles sexually transmitted infection/HIV re-testing rates among men who have sex with men. Sexually transmitted infections 87(3): 229-31	- Study does not contain a relevant intervention
Cheeks, Miyesha A, Fransua, Mesfin, Stringer, Harold G Jr et al. (2016) A Quality Improvement Project to Increase Early Detection of Syphilis Infection or Re-infection in HIV-infected Men Who Have Sex With Men. The Journal of the Association of Nurses in AIDS Care : JANAC 27(2): 143-52	- Population does not meet the protocol criteria for high risk
Gray, Richard T, Hoare, Alexander, Prestage, Garrett P et al. (2010) Frequent testing of highly sexually active gay men is required to control syphilis. Sexually transmitted diseases 37(5): 298-305	- Not a relevant study design
Harte, Derval, Mercey, Danielle, Jarman, Jay et al. (2011) Is the recall of men who have sex with men (MSM) diagnosed as having bacterial sexually transmitted infections (STIs) for re-screening a feasible and effective strategy?. Sexually transmitted infections 87(7): 577-82	- Not a relevant study design
Nyatsanza, Farai, McSorley, John, Murphy, Siobhan et al. (2016) 'It's all in the message': the utility of personalised short message service (SMS) texts to remind patients at higher risk of STIs and HIV to reattend for testing-a repeat before and after study. Sexually transmitted infections 92(5): 393-5	- Data not reported in an extractable format
Patel, Pragna, Bush, Tim, Mayer, Kenneth et al. (2012) Routine brief risk-reduction counseling with biannual STD testing reduces STD incidence among HIV-infected men who have sex with men in care. Sexually transmitted diseases 39(6): 470-4	- Population does not meet the protocol criteria for high risk
Pitpitan, EV, Semple, SJ, Aarons, GA et al. (2018) Factors associated with program effectiveness in the implementation of a sexual	- Study does not contain a relevant intervention

Study	Code [Reason]
risk reduction intervention for female sex workers across Mexico: results from a randomized trial. PloS one 13(9): e0201954	
Reitsema, Maarten, Heijne, Janneke, Visser, Maartje et al. (2020) Impact of frequent testing on the transmission of HIV and N. gonorrhoeae among men who have sex with men: a mathematical modelling study. Sexually transmitted infections 96(5): 361-367	- Not a relevant study design
Ronen, Keshet, Golden, Matthew R, Dombrowski, Julia C et al. (2019) Uptake and Impact of Short Message Service Reminders via Sexually Transmitted Infection Partner Services on Human Immunodeficiency Virus/Sexually Transmitted Infection Testing Frequency Among Men Who Have Sex With Men. Sexually transmitted diseases 46(10): 641-647	- Data not reported in an extractable format
Roth, Alexis M, Rosenberger, Joshua G, Reece, Michael et al. (2012) A methodological approach to improve the sexual health of vulnerable female populations: incentivized peer-recruitment and field-based STD testing. Journal of health care for the poor and underserved 23(1): 367-75	- Not a relevant study design
Samaranayake, A, Chen, M, Hocking, J et al. (2009) Legislation requiring monthly testing of sex workers with low rates of sexually transmitted infections restricts access to services for higher-risk individuals. Sexually transmitted infections 85(7): 540-2	- Published before 2010
Smith, Kirsty S, Hocking, Jane S, Chen, Marcus Y et al. (2015) Dual Intervention to Increase Chlamydia Retesting: A Randomized Controlled Trial in Three Populations. American journal of preventive medicine 49(1): 1-11	- Study does not contain a relevant intervention
Snow, A.F., Vodstrcil, L.A., Fairley, C.K. et al. (2013) Introduction of a sexual health practice nurse is associated with increased STI testing of men who have sex with men in primary care. BMC Infectious Diseases 13(1): 298	- Data not reported in an extractable format
Tuite, Ashleigh R; Burchell, Ann N; Fisman, David N (2014) Cost-effectiveness of enhanced syphilis screening among HIV-positive men who have sex with men: a microsimulation model. PloS one 9(7): e101240	- Population does not meet the protocol criteria for high risk
Tuite, Ashleigh R; Fisman, David N; Mishra, Sharmistha (2013) Screen more or screen more often? Using mathematical models to inform syphilis control strategies. BMC public health 13: 606	- Not a relevant study design
Tuite, Ashleigh R, Shaw, Souradet, Reimer, Joss N et al. (2018) Can enhanced screening of men with a history of prior syphilis infection stem the epidemic in men who have sex with men? A mathematical modelling study. Sexually transmitted infections 94(2): 105-110	- Not a relevant study design

Study	Code [Reason]
van Liere, Genevieve A F S, Dukers-Muijrers, Nicole H T M, Kuizenga-Wessel, Sophie et al. (2020) What Is the Optimal Testing Strategy for Oropharyngeal Neisseria gonorrhoeae in Men Who Have Sex With Men? Comparing Selective Testing Versus Routine Universal Testing From Dutch Sexually Transmitted Infection Clinic Data (2008-2017). Clinical infectious diseases : an official publication of the Infectious Diseases Society of America 71(4): 944-951	- Population does not meet the protocol criteria for high risk
Weiss, K.M., Jones, J.S., Anderson, E.J. et al. (2019) Optimizing Coverage vs Frequency for Sexually Transmitted Infection Screening of Men Who Have Sex with Men. Open Forum Infectious Diseases 6(10)	- Not a relevant study design
Wilkinson, Anna L, Pedrana, Alisa E, El-Hayek, Carol et al. (2016) The Impact of a Social Marketing Campaign on HIV and Sexually Transmissible Infection Testing Among Men Who Have Sex With Men in Australia. Sexually transmitted diseases 43(1): 49-56	- Data not reported in an extractable format
Wilson, David P, Heymer, Kelly-Jean, Anderson, Jonathan et al. (2010) Sex workers can be screened too often: a cost-effectiveness analysis in Victoria, Australia. Sexually transmitted infections 86(2): 117-25	- Not a relevant study design
Wingood, GM, Seth, P, DiClemente, RJ et al. (2009) Association of sexual abuse with incident high-risk human papillomavirus infection among young African-American women. Sexually transmitted diseases 36(12): 784-786	- Not a relevant study design
Zou, Huachun, Fairley, Christopher K, Guy, Rebecca et al. (2013) Automated, computer generated reminders and increased detection of gonorrhoea, chlamydia and syphilis in men who have sex with men. PloS one 8(4): e61972	- Data not reported in an extractable format
Zou, Huachun, Fairley, Christopher K, Guy, Rebecca et al. (2012) The efficacy of clinic-based interventions aimed at increasing screening for bacterial sexually transmitted infections among men who have sex with men: a systematic review. Sexually transmitted diseases 39(5): 382-7	- Not a relevant study design

Economic review

Study	Reason for exclusion
Wilson, David P, Heymer, Kelly-Jean, Anderson, Jonathan et al. (2010) Sex workers can be screened too often: a cost-effectiveness analysis in Victoria, Australia. Sexually transmitted infections 86(2): 117-25	Study is conducted in a population of licensed commercial sex workers in Victoria, Australia. This was not considered to be a sufficiently relevant population to the current UK context to justify including the article.

Appendix K – Research recommendations – full details

K.1 Research recommendation

What are the most effective methods to reduce the stigma associated with accessing sexual health services?

K.1.1 Why this is important

The committee noted themes in the qualitative research that indicated that shame and stigma were powerful barriers to people attending sexual health services, and also to the uptake of treatments like PrEP. They were interested in how services can be less stigmatising, for example by delivering them within other services or by making service changes that helped to reduce stigma.

K.1.2 Rationale for research recommendation

Importance to 'patients' or the population	Many people, particularly those from underserved groups are reluctant to go to sexual health services because they feel embarrassed or ashamed. This means they may take risks with their sexual health by not attending clinics.
Relevance to NICE guidance	Due to a lack of direct evidence, the committee were unable to make specific recommendations about things that services could do to reduce the perceived stigma of their potential users. Further research might enable future updates of this guideline to address the issue.
Relevance to the NHS	Reducing the stigma associated with sexual health services may make the people who are most at risk more likely to access the services and improve their sexual wellbeing.
National priorities	Medium
Current evidence base	No evidence
Equality considerations	People with the poorest sexual health are often those who would experience most stigma by attending sexual health services. This research could reduce inequalities in sexual health.

K.1.3 Modified PICO table

Population	People aged over 16 at high- or very high-risk of getting an STI including: • commercial sex workers • people with multiple sex partners (>10 partners within 3 months) • People engaging in so-called chemsex • gay, bisexual and other men who have sex with men (MSM) previously diagnosed with a bacterial STI (in the last year)
Intervention	Changes to services or the delivery of services, or interventions with the specific aim of reducing stigma or shame associated with service use.

Comparator	Normal care
Outcome	Demographic data about service use Patterns of service use STI rates Testing rates Perceptions of service users and non-service users about accessibility and stigma
Study design	Mixed methods: Cluster RCT with associated qualitative study
Timeframe	Medium term
Additional information	None