



OPEN ACCESS



ORIGINAL ARTICLE

The SPORTSMART study: a pilot randomised controlled trial of sexually transmitted infection screening interventions targeting men in football club settings

Sebastian S Fuller,¹ Catherine H Mercer,² Andrew J Copas,² John Saunders,³ Lorna J Sutcliffe,³ Jackie A Cassell,⁴ Graham Hart,⁵ Anne M Johnson,⁶ Tracy E Roberts,⁷ Louise J Jackson,⁷ Pamela Muniina,² Claudia S Estcourt³

¹Queen Mary University of London, UK (where the research took place)

²Centre for Sexual Health and HIV Research, University College London, London, UK

³Blizard Institute of Cell and Molecular Science, Queen Mary, University of London, London, UK

⁴Division of Primary Care and Public Health, Brighton and Sussex Medical School, Brighton, UK

⁵Faculty of Population Health Sciences, University College London, London, UK

⁶Department of Infection & Population Health, University College London, London, UK

⁷Department of Health Economics Facility, University of Birmingham, Birmingham, UK

Correspondence to

Dr Sebastian S Fuller, St George's, University of London, Infection and Immunity research institute, Cranmer Terrace, London, UK, SW17 0RE; sfuller@sgul.ac.uk

Received 4 June 2014

Revised 14 September 2014

Accepted 24 November 2014

Published Online First

15 December 2014



► <http://dx.doi.org/10.1136/sextrans-2014-051715>



CrossMark

To cite: Fuller SS, Mercer CH, Copas AJ, et al. *Sex Transm Infect* 2015;**91**:106–110.

ABSTRACT

Background Uptake of chlamydia screening by men in England has been substantially lower than by women. Non-traditional settings such as sports clubs offer opportunities to widen access. Involving people who are not medically trained to promote screening could optimise acceptability.

Methods We developed two interventions to explore the acceptability and feasibility of urine-based sexually transmitted infection (STI) screening interventions targeting men in football clubs. We tested these interventions in a pilot cluster randomised control trial. Six clubs were randomly allocated, two to each of three trial arms: team captain-led and poster STI screening promotion; sexual health adviser-led and poster STI screening promotion; and poster-only STI screening promotion (control/comparator). Primary outcome was test uptake.

Results Across the three arms, 153 men participated in the trial and 90 accepted the offer of screening (59%, 95% CI 35% to 79%). Acceptance rates were broadly comparable across the arms: captain-led: 28/56 (50%); health professional-led: 31/46 (67%); and control: 31/51 (61%). However, rates varied appreciably by club, precluding formal comparison of arms. No infections were identified. Process evaluation confirmed that interventions were delivered in a standardised way but the control arm was unintentionally 'enhanced' by some team captains actively publicising screening events.

Conclusions Compared with other UK-based community screening models, uptake was high but gaining access to clubs was not always easy. Use of sexual health advisers and team captains to promote screening did not appear to confer additional benefit over a poster-promoted approach. Although the interventions show potential, the broader implications of this strategy for UK male STI screening policy require further investigation.

BACKGROUND

Men's uptake of chlamydia screening within the English National Chlamydia Screening Programme (NCSP) has been substantially lower than that reported in women.¹ Among all 15-year-old to 24-year-old participants in the NCSP between July and September 2013, only 30% of tests were returned by men.¹ Evidence suggests that although

women of reproductive age bear the majority of adverse health consequences of chlamydial infection,² the inclusion of men in screening efforts can be effective in reducing the population burden of infection,^{3 4} but this may be less cost effective than other strategies.⁵

Men's lower chlamydia testing coverage could be explained by differences in men's and women's health-seeking behaviours, underpinned by different beliefs about health and illness.^{3 6–8} However, growing evidence suggests that men are beginning to appreciate the rationale for sexually transmitted infection (STI) testing and have clear preferences for how and where they would like to access it.^{7 9–15} However, men appear to find traditional healthcare settings such as genitourinary medicine clinics and general practice most acceptable.¹¹ To date there has been limited success in implementing effective male STI screening in primary care in England;^{16–20} while evidence supports that interventions can increase STI test offers to young people in general practice,²¹ barriers remain,^{22 23} suggesting that offering men screening in other settings remains important. Sports settings offer potential for STI screening activities for men who engage in sport.^{24–27} Forty per cent of men (over 16 years) in a recent English survey reported participating in sport at least once a week.²⁸ Football is the most popular team sport in England, with over 16% of 14–25 year olds playing at least once a week.²⁸ Many teams operate within a national league structure that could facilitate widespread implementation of new interventions.

Involving people who are not medically trained to impart information about sexual health, testing and treatment also seems to be well accepted by targeted populations.^{29–31} However, this approach has not been evaluated as a means of promoting sexual health in sports settings in the UK. We developed two interventions to explore the acceptability and feasibility of football clubs as settings for STI screening (specifically, *Chlamydia trachomatis* and *Neisseria gonorrhoeae*) and the potential role of team captains in increasing uptake of screening in young men. We tested these interventions in the SPORTSMART pilot cluster randomised control trial (RCT) to determine preliminary evidence of effectiveness.

METHODS

Trial design

We used a cluster RCT design. We allocated two clubs to each of our three trial arms: team captain-led and poster STI screening promotion (arm 1), sexual health adviser-led and poster STI screening promotion (arm 2), or a poster-only STI screening promotion (control/comparator arm 3).

Outcomes

Primary outcome: proportion of eligible men accepting the offer of screening (intervention uptake=number of men offered the test kit/number of test kits returned within 4 weeks of offer).

Secondary outcome: proportion of screened men who tested positive for chlamydia and/or gonorrhoea (number of patients with positive results/number of test kits returned); health service costs (reported elsewhere).

Statistical analysis

We reported the primary outcome with a 95% CI based on a robust SE that acknowledges the clustering of participants by club. We do not report 95% CIs for the primary outcome by arm, nor conduct testing to compare arms, because there were only two clubs per arm and variability between clubs was substantial so that precision is low. The analysis of outcomes was not blinded to intervention arm.

Club recruitment

We identified all potentially eligible amateur clubs in appropriate geographical areas from the Amateur Football Combination listings available on the internet.³²

Eligibility requirements

We assessed each football club's eligibility by telephone discussion with the club manager or secretary. Clubs were considered eligible if they had working toilet facilities, private/team changing rooms and a minimum of two teams with 11 or more men aged at least 18 years old; and at least one home match (match played at the participating club) during the 3-month study period. We offered each club £1000 as reimbursement of their participation costs.

Randomisation

Prior to randomisation, we divided clubs into three pairs. Pairing was based on a description of the club memberships' ethnicity, age, education status and membership size, as described by early qualitative work¹⁴ and club representatives' reports, and was performed to achieve approximate balance across pairs in these characteristics. The pairs of clubs were then allocated to one of three study arms by the lead study statistician by random permutation. Clubs (and thus participants) were unblinded directly following study arm allocation. It was not feasible that clubs or investigators be blind to the intervention type during implementation or evaluation.

Team captain and health adviser recruitment

During the recruitment phase, the trial coordinator explained to the club contacts that two of the participating clubs would be randomly allocated to a captain-promoted screening intervention and so all participating clubs needed to have at least one captain willing to promote the screening intervention among two teams in each club.

Health adviser selection

Based on our preclinical qualitative work,¹⁴ we recruited a male health adviser to deliver our STI screening promotion. The health adviser was also in the same age group as the football players involved in the intervention, and so the distinguishing difference between the self-selected team captain and the health adviser was that the health adviser was a medical professional from outside the club.

Delivery of the interventions

The trial coordinator emailed the club contacts prior to the match with brief details of the screening event. On the day, the trial coordinator put up posters in all participating clubs and set-up the test kit collection boxes in the club changing rooms just prior to players' arrival. The interventions were delivered according to randomisation during the usual prematch or post-match team briefing. Interventions were as follows:

1. Captain and poster screening promotion: the team captain delivered a standardised brief screening promotion talk of <5 min duration (figure 1) and then handed each player a test kit and answered any questions from participants.
2. Health adviser and poster screening promotion: a sexual health adviser from the study clinic delivered the standardised brief screening promotion talk of <5 min duration and then handed each player a test kit and answered any questions from participants.
3. Poster-only screening promotion (comparator arm): posters were displayed that the men were free to read with kits readily available but there was no verbal information given.

Men who wished to participate completed a sample kit according to the instructions provided and placed their completed kits back into the secure collection box. Alternatively men could take the kit away with them for later completion and post it back to the clinic in a discreet postage-paid package. All clinical follow-up, including provision of test results via text (SMS) message, was done by clinic staff according to routine standards of care.

Process evaluation and additional data collection

Captains and the sexual health adviser completed a 'report-back' form directly after each intervention. Information gathered included number of men in the changing room and exposed to the intervention, and their views of implementing the intervention. In addition, the trial coordinator took field notes to describe the circumstances of each intervention (including weather, match outcome, timing of intervention) to assess fidelity of the interventions in practice.

Topic	Message
Health promotion message	Chlamydia and Gonorrhoea are common and often present without any sign that anything is wrong (asymptomatic)
Screening information	Confidential; right to refuse; how contacted with results
Test kit instructions	Step-by-step instructions
Further research participation	Invitation to follow-up qualitative interview

Figure 1 Screening promotion content.

Resource use data were collected prospectively for use in health economics analyses (reported elsewhere).

Participants (players) were invited to take part in a telephone semi-structured interview to explore their views of the interventions within a month of participating in the initial screening event (reported elsewhere).

Two weeks after the intervention was completed, all (playing and non-playing) club members aged at least 18 years were invited to take part in a brief, self-administered, anonymous, pen-and-paper survey questionnaire to assess club members' sexual risk behaviour and previous STI testing history to inform estimates of public health impact of offering screening in these settings (reported elsewhere).

Sample size

We aimed to recruit 200 men to estimate the overall acceptance of screening rate with acceptable precision considering a wide range of possible rates due to the lack of directly relevant evidence from previous studies. Specifically this sample size allows us to estimate the rate within 7% if the rate is 50% (ie, a 95% CI of 43% to 57%) or within 5% if it is either higher or lower (85% or 15%), assuming minimal variability between clubs.

RESULTS

Recruitment

Recruitment was conducted between October and December 2012. Clubs were contacted by the trial coordinator via email and/or telephone to assess interest and eligibility. In total, 5 of

the 18 clubs initially identified had invalid contact details. Of the remaining 13 clubs, 5 did not respond and 8 (62%) indicated that they were willing to participate. Six were chosen based on the willingness of a club representative to meet with the study coordinator and fully discuss the study objectives; the remaining two clubs were placed on a reserve list (figure 2).

Acceptability of screening and STI positivity

The interventions were implemented between February and April 2013. Analysis of the main outcome was completed in May 2013. Across the three arms, 153 men in six clubs participated in the trial and 90 (59%, 95% CI 35% to 79%) accepted the offer of screening (table 1). Screening was considered to be accepted if players returned test kits within 4 weeks of intervention implementation at their club. All players in participating teams were eligible for the intervention. Acceptance rates varied considerably by club (table 1), but the aggregate rates were broadly comparable across the arms: captain-led: 28/56 (50%); health professional-led: 31/46 (67%); and control: 31/51 (61%). The variability within arms was greater than the variability between arms. The majority of test kits were completed within the clubs, and only one was returned by mail. There were no positive tests for chlamydia or gonorrhoea from any of the study arms.

Process evaluation

The Amateur Football Combination club listings were a useful initial resource to identify clubs, but contact details for individual clubs were often incorrect and some club websites contained

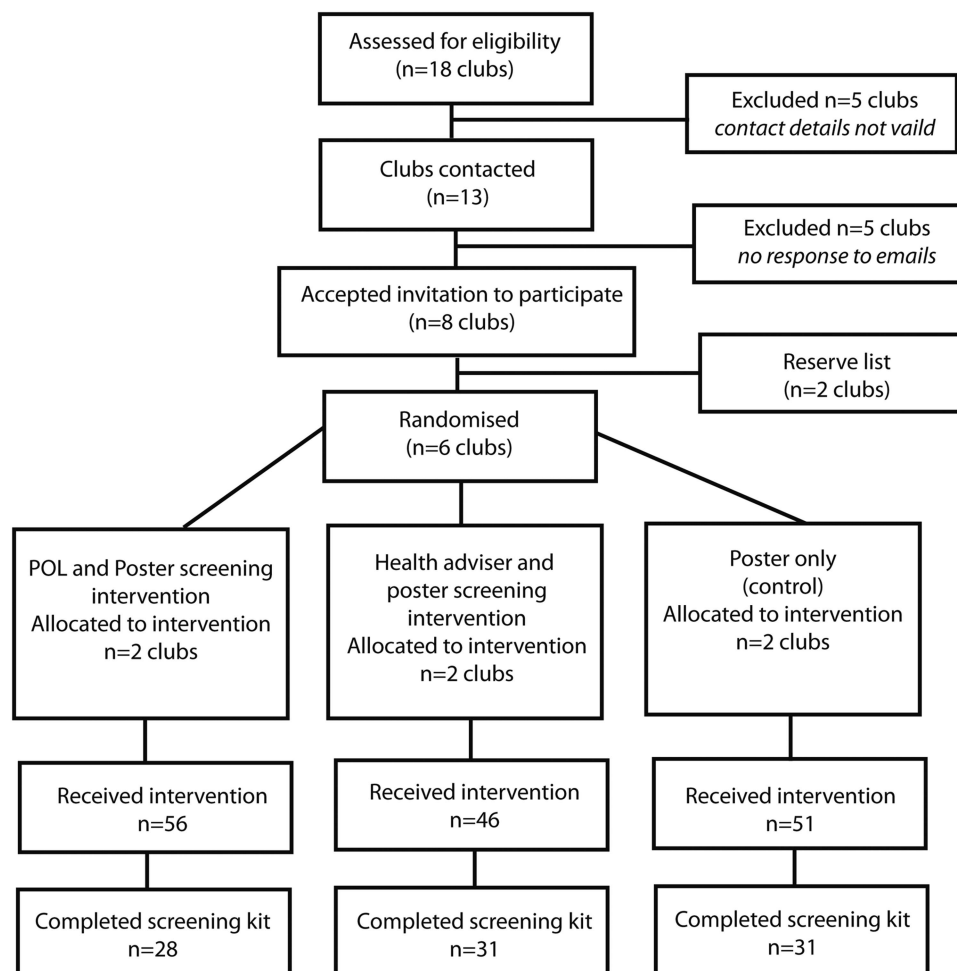


Figure 2 Participant flow in the SPORTSMART trial. POL, popular opinion leader.

Table 1 Screening kit uptake among participating clubs

Study arm	Club	Players in changing room	Completed kits returned	% return
Health professional-led	1a	24	10	42
	1b	22	21	95
	Combined	46	31	67
Captain-led	2a	26	10	38
	2b	30	18	60
	Combined	56	28	50
Control	3a	24	20	83
	3b	27	11	41
	Combined	51	31	61
Total	All	153	90	59

out-of-date contact information. We do not know whether the reason five clubs did not respond was because of a lack of interest in the study or our failure to establish an appropriate means of communication.

A number of cancelled and rescheduled matches meant that we were unable to deliver the interventions to as many players as planned. Evaluation of field notes and report-back forms from captains and the sexual health adviser confirmed that the interventions were delivered in a standardised way across all study arms and captains felt comfortable delivering the short intervention. However, the poster comparator arm was unintentionally 'enhanced' by some captains, who actively publicised the availability of STI screening at the club prior to the day by including details of the research in their weekly team information email and encouraging players to participate. There were no adverse effects from this research.

DISCUSSION

To our knowledge, this is the first UK trial of STI screening that targets young men in the football clubs in which they play. The design enabled us to report accurate measures of uptake as, unlike many published community and non-healthcare-based screening evaluations, we measured the number of men to whom the interventions were offered. Urine-based STI screening was acceptable irrespective of how it was offered. The additional support of team captains and sexual health advisers in the form of a short verbal explanation of the rationale and process for STI screening, followed by handing a kit directly to each man, did not result in greater uptake than simply making the test kits available on the day, supported by an explanatory poster.

Although implementation of the interventions was straightforward, the poster-only arm was unintentionally promoted by some team captains who encouraged men to participate in the research via their regular team information emails. We were dependent on club fixtures and subject to last-minute match cancellations, which meant that we were unable to deliver the interventions to as many players as planned and we did not achieve our intended sample size. The interventions began late in the match season, and although we were confident that extending the recruitment phase would have enabled us to reach our intended sample size, this was unfeasible as no further matches were scheduled until after the 4-month match break. We found a greater than anticipated variability between clubs in the acceptability of screening, which limited our ability to estimate acceptability under any single intervention and reduced precision in our estimate of overall acceptability.

Although many different forms of 'outreach' screening have been described, very few focus exclusively on men, despite research indicating that male patterns of sexual healthcare access

differ from those of women.^{10 15 33} A recent systematic review that included 25 chlamydia screening outreach screening strategies for men and women found a median participation rate of 53% with close to 80% of participants tested.³³ The highest uptake of testing (85%) was reported in one of the two studies offering chlamydia screening in Australian Football League clubs,²⁵⁻²⁷ considerably higher than in our study. However, the Australian studies were set in rural areas with few alternative opportunities for STI screening, unlike our London urban areas that all had multiple different STI screening venues within easy reach. Only two of the included studies (both offering testing to young people attending a leisure centre) were conducted in the UK.^{24 34} The acceptability of screening in these studies varied: one study reported just under 50% uptake of screening,³⁴ and the other 86%.²⁴ The study reporting 86% testing uptake offered screening to both men and women attending leisure centres in Scotland; 62% of men offered screening accepted, with total number of lifetime sexual partners ($p=0.003$) a determinant of uptake.²⁴ Other studies of chlamydia screening promotion have found varying uptake of screening within similar venues, but unlike our trial, this was attributed to differences in the way researchers invited potential participants to engage in the study.¹⁰

More young men play football at least once a week than any other sport,²⁹ and so amateur football clubs could be promising settings for STI screening initiatives. A recent random probability sample survey of young UK men suggests that men who do and do not play football are at similar risk of STIs.¹¹ The same survey also reported that just over half of men who play football at least once a month would find the venue in which they play an acceptable setting to access self-testing kits,¹¹ reflected in the uptake of testing within this pilot study.

Our approach appears to be broadly acceptable and feasible to young football players, team captains and football clubs. However, several clubs were uncontactable and others did not respond.

Although the poster-only arm was unintentionally enhanced due to the enthusiasm of the captains in this arm, their strategy for enhancement required minimal effort at no additional cost. Should this type of screening be implemented more widely, we would expect captains to forewarn their players of the screening activity even if they had no further role in promotion of screening.

We did not detect any new *C. trachomatis* or *N. gonorrhoeae* infections, but this was not unexpected given the estimated population prevalence.³⁴ Adopting a male-focused approach to screening may have been an important factor in high uptake, and factors related to the role of setting and collective screening within groups of men who know each other deserve further study. Although we have developed a simple, feasible and acceptable approach to male STI screening and operationalised it within football clubs, given men's reported preference for traditional healthcare settings,^{11 14} a clearer view of the public health benefits of this approach is needed before we can be certain of its wider impact.

Key messages

- ▶ Compared with other community-based screening approaches, uptake to the SPORTSMART intervention was high.
- ▶ Acceptance rates were highly variable between clubs, but were broadly comparable irrespective of the intervention.
- ▶ Adopting a male-focused approach to screening may have been an important factor in high uptake; the impact of social group setting on screening uptake warrants further investigation.

Handling editor David A Lewis

Acknowledgements We are very grateful to Mr Simon Morgan, Head of Community Development, Barclay's Premier League, Mr David Higgins, all the participating clubs and players, Ms Stephanie Hanson and Mr Timothy Hill for their assistance with this study.

Contributors SSF coordinated the study, collected data and contributed to the design and analysis. CSE is the principal investigator, had the original idea for the study and led design of the trial. PM led the statistical analysis with guidance from AJC and CHM. All authors contributed to the design of the study and provided input to this manuscript.

Funding This report is independent research funded by the National Institute for Health Research (*Targeting young men for better sexual health: THE BALLSEYE PROGRAM*, reference number RP-PG-0707-10208).

Competing interests None.

Patient consent Club managers gave consent for the club's involvement in the study. Signed informed consent was obtained from captains before the intervention. Football team members opted in to screening by completing the kit offered but could opt out of the intervention at any time.

Ethics approval National Research Ethics Service Committee South Central—Berkshire (study 13/SC/0029).

Provenance and peer review Not commissioned; externally peer reviewed.

Open Access This is an Open Access article distributed in accordance with the Creative Commons Attribution Non Commercial (CC BY-NC 4.0) license, which permits others to distribute, remix, adapt, build upon this work non-commercially, and license their derivative works on different terms, provided the original work is properly cited and the use is non-commercial. See: <http://creativecommons.org/licenses/by-nc/4.0/>

REFERENCES

- Public Health England. CTAD July—September 2013 Data. 2013. <http://www.chlamydia-screening.nhs.uk/ps/data.asp>
- The UK Collaborative Group for HIV and STI Surveillance. *Testing Times. HIV and other Sexually Transmitted Infections in the United Kingdom*. Health Protection Agency, Centre for Infections, 2007.
- Chaudhary R, Heffernan CM, Illsley AL, et al. Opportunistic screening for Chlamydia: a pilot study into male perspectives on provision of Chlamydia screening in a UK university. *J Public Health (Oxf)* 2008;30:466–71.
- Hartney T, Baraitser P, Nardone A. The behavioural impact of chlamydia testing and attitudes toward testing among young adults in England. *Sex Transm Infect* 2013;89: A56–7.
- Turner K, Adams E, Grant A, et al. Costs and cost effectiveness of different strategies for chlamydia screening and partner notification: an economic and mathematical modelling study. *Brit Med J* 2011;342.
- Hawkes S, Hart G. Men's sexual health matters: promoting reproductive health in an international context. *Trop Med Int Health* 2000;5:A37–44.
- Balfe M, Brugha R, O'Connell E, et al. Men's attitudes toward chlamydia screening: a narrative review. *Sexual Health* 2012;9:120–30.
- Richardson D, Maple K, Perry N, et al. A pilot qualitative analysis of the psychosocial factors which drive young people to decline chlamydia testing in the UK: implications for health promotion and screening. *Int J STD AIDS* 2010;21:187.
- Adams E, Charlett A, Edmunds W, et al. Chlamydia trachomatis in the United Kingdom: a systematic review and analysis of prevalence studies. *Sex Transm Infect* 2004;80:354–62.
- Marrazzo JM, Scholes D. Acceptability of urine-based screening for Chlamydia trachomatis in asymptomatic young men: a systematic review. *Sex Transm Dis* 2008;35:S28–33.
- Saunders JM, Mercer CH, Sutcliffe LJ, et al. Where do young men want to access STI screening? A stratified random probability sample survey of young men in Great Britain. *Sex Transm Infect* 2012;88:427–32.
- Lorimer K, McDaid L. Young men's views on the barriers and facilitators of Internet-based chlamydia trachomatis screening: a qualitative study. *J Med Internet Res* 2013;15:e265.
- Lorimer K, Reid M, Hart G. "It has to speak to people's everyday life...": qualitative study of men and women's willingness to participate in a non-medical approach to Chlamydia trachomatis screening. *Sex Transm Infect* 2008;85:201–5.
- Saunders JM, Sutcliffe LJ, Hart GJ, et al. The acceptability of using soccer clubs as venues for chlamydia screening in young men: results from a qualitative study. *Sex Transm Infect* 2012;88:A52.
- Hart GJ, Duncan B, Fenton KA. Chlamydia screening and sexual health. *Sex Transm Infect* 2002;78:396–7.
- Cassell J, Mercer C, Fenton K, et al. A comparison of the population diagnosed with chlamydia in primary care with that diagnosed in sexual health clinics: implications for a national screening programme. *Public Health* 2006;120:984–8.
- Kufuji O, Slack R, Cassell J, et al. Who is being tested for genital chlamydia in primary care? *Sex Transm Infect* 2003;79:234–6.
- Johnson SA, Simms I, Sheringham J, et al. The implementation of chlamydia screening: a cross-sectional study in the South East of England. *Sex Transm Infect* 2010;86:217–21.
- Hogan AH, Howell-Jones RS, Pottinger E, et al. "...they should be offering it": a qualitative study to investigate young people's attitudes towards chlamydia screening in GP surgeries. *BMC Public Health* 2010;10:616.
- Kalwiji S, French S, Mugezi R, et al. Using educational outreach and a financial incentive to increase general practices' contribution to chlamydia screening in South-East London 2003–2011. *BMC Public Health* 2012;12:802.
- McNulty CAM, Hogan AH, Ricketts EJ, et al. Increasing chlamydia screening tests in general practice: a modified Zelen prospective Cluster Randomised Controlled Trial evaluating a complex intervention based on the Theory of Planned Behaviour. *Sex Transm Infect* 2014;90:188–94.
- Lorimer K, Martin S, McDaid LM. The views of general practitioners and practice nurses towards the barriers and facilitators of proactive, internet-based chlamydia screening for reaching young heterosexual men. *BMC Fam Pract* 2014;15:127.
- Hocking JS, Parker RM, Pavlin N, et al. What needs to change to increase chlamydia screening in general practice in Australia? The views of general practitioners. *BMC Public Health* 2008;8:425.
- Lorimer K, Reid ME, Hart G. Willingness of young men and women to be tested for Chlamydia trachomatis in three non-medical settings in Glasgow, UK. *J Fam Plann Reprod Health Care* 2009;35:21–6.
- Gold J, Hocking J, Heller M. The feasibility of recruiting young men in rural areas from community football clubs for STI screening. *Aust N Z J Public Health* 2007;31:243–6.
- Wade AJ, Hocking JS, Hellard ME. Chlamydia trachomatis in heterosexual men in Melbourne: a community-based study. *Sexual Health* 2007;4:137–8.
- Kong FY, Hocking JS, Link CK, et al. Sex and sport: chlamydia screening in rural sporting clubs. *BMC Infect Dis* 2009;9:73.
- Sport England. Once a week participation in sport (1×30 minutes moderate intensity). Active people survey 7 Q2 April 2012–April 2013. 2013. <http://www.sportengland.org/research/who-plays-sport/national-picture/who-plays-sport/>
- Kegeles SM, Hays RB, Coates TJ. The Mpowerment Project: a community-level HIV prevention intervention for young gay men. *Am J Public Health* 1996;86:1129–36.
- Williamson LM, Hart GJ, Flowers P, et al. The Gay Men's Task Force: the impact of peer education on the sexual health behaviour of homosexual men in Glasgow. *Sex Transm Infect* 2001;77:427–32.
- Li L, Guan J, Liang L-J, et al. Popular opinion leader intervention for HIV stigma reduction in health care settings. *AIDS Educ Prev* 2013;25:327–35.
- Amateur Football Combination. 2013. <http://www.amateurfootballcombination.com/clubs/list/>
- Hengel B, Jamil MS, Mein JK, et al. Outreach for chlamydia and gonorrhoea screening: a systematic review of strategies and outcomes. *BMC Public Health* 2013;13:1040.
- Sonnenberg P, Clifton S, Beddows S, et al. Prevalence, risk factors, and uptake of interventions for sexually transmitted infections in Britain: findings from the National Surveys of Sexual Attitudes and Lifestyles (Natsal). *Lancet* 2013;13:61947–9.

STI

The SPORTSMART study: a pilot randomised controlled trial of sexually transmitted infection screening interventions targeting men in football club settings

Sebastian S Fuller, Catherine H Mercer, Andrew J Copas, John Saunders, Lorna J Sutcliffe, Jackie A Cassell, Graham Hart, Anne M Johnson, Tracy E Roberts, Louise J Jackson, Pamela Muniina and Claudia S Estcourt

Sex Transm Infect 2015 91: 106-110 originally published online December 15, 2014
doi: 10.1136/sextrans-2014-051719

Updated information and services can be found at:
<http://sti.bmj.com/content/91/2/106>

These include:

References

This article cites 29 articles, 12 of which you can access for free at:
<http://sti.bmj.com/content/91/2/106#BIBL>

Open Access

This is an Open Access article distributed in accordance with the Creative Commons Attribution Non Commercial (CC BY-NC 4.0) license, which permits others to distribute, remix, adapt, build upon this work non-commercially, and license their derivative works on different terms, provided the original work is properly cited and the use is non-commercial. See: <http://creativecommons.org/licenses/by-nc/4.0/>

Email alerting service

Receive free email alerts when new articles cite this article. Sign up in the box at the top right corner of the online article.

Topic Collections

Articles on similar topics can be found in the following collections

[Open access](#) (179)
[Screening \(epidemiology\)](#) (883)
[Screening \(public health\)](#) (883)
[Clinical trials \(epidemiology\)](#) (147)

Notes

To request permissions go to:
<http://group.bmj.com/group/rights-licensing/permissions>

To order reprints go to:
<http://journals.bmj.com/cgi/reprintform>

To subscribe to BMJ go to:
<http://group.bmj.com/subscribe/>