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ORIGINAL ARTICLE

Assessing user preferences for sexually transmitted infection testing services: a discrete choice experiment

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ABSTRACT

Objective To assess user preferences for different aspects of sexually transmitted infection (STI) testing services.

Design A discrete choice experiment.

Setting 14 centres offering tests for STIs in East Sussex, England.

Participants People testing for STIs.

Main outcome measure (Adjusted) ORs in relation to preferred service characteristics.

Results 3358 questionnaires were returned; mean age 26 (SD 9.4) years. 70% (2366) were recruited from genitourinary medicine (GUM) clinics. The analysis suggested that the most important characteristics to users were whether 'staff had specialist STI knowledge' compared with 'staff without it' (OR 2.55; 95% CI 2.47 to 2.63) and whether 'tests for all STIs' were offered rather than 'some' (OR 2.19; 95% CI 2.12 to 2.25). They remained the most important two service characteristics despite stratifying the analysis by variables such as age and sex. Staff levels of expertise were viewed as particularly important by people attending CASH centres, women and non-men who have sex with men. A 'text or call to a mobile phone' and 'dropping in and waiting' were generally the preferred methods of results reporting and appointment system, respectively.

Conclusions This study suggests that people testing for STIs place particular importance on testing for all infections rather than some and staff with specialist STI knowledge. Thus, targets based purely on waiting up to 48 h for an appointment are misguided from a user perspective.

INTRODUCTION

Sexually transmitted infections (STIs) such as HIV, gonorrhoea and syphilis not only impact health at an individual level[1 2] they also affect the health of communities as a whole and can be costly to treat.[3–5] The last 15 years in the UK have seen significant increases in the incidence of STIs.[6] They have consequently become a major public health concern, as has access to appropriate healthcare facilities with significant increases in related clinic attendances.[6] Testing for infections is a key method of limiting disease-related morbidities, onward transmissions and costs. Traditionally, STI testing services in the UK have been provided through hospital outpatient facilities via genitourinary medicine (GUM) clinics,[6] but this is no longer exclusively the case—an increasing array of services is being offered including primary care routes in order to provide increased access and choice.[7]

The recent white paper Equity and Excellence[8] emphasises the importance of basing services around patient's needs rather than patient's needs around services. Recent British Association of Sexual Health and HIV endorsed standards of care also emphasise the importance of involving patients and the public in the design of future sexual health services.[9] However, quantitative research with respect to assessing preferences for STI-testing services remains limited.[10–14] It is unclear therefore whether changes to service configurations represent improvements from a user perspective, whether preferences vary by observable characteristics such as age and sex or how they relate to current policy targets such as appointments within 48 h at GUM clinics.[15]

METHODS

Preferences for different aspects of STI-testing services were assessed using a discrete choice experiment (DCE).[16–19] DCEs require respondents to choose between a number of competing service options that vary in terms of their design and outcomes they produce. Each service option is described in terms of a number of attributes (eg, the time it takes to receive test results) and levels (eg, the same day, 1 or 5 days) and is compared against at least one alternative. The overall results indicate the relative preference of each attribute and level.

Final decisions on all aspects of the questionnaire design were made by the study Steering Group (SG) in consultation with a user Advisory Group (AG). The penultimate version of the questionnaire was piloted to minimise the risk of error. Ethical approval was obtained from Brighton West Research Ethics Committee (08/H1111/86).

Choice of attributes and levels

The attributes and associated levels were determined using a three-staged approach. First, issues that the SG and AG considered to be important a priori were combined with issues from a literature review to generate a list of candidate attributes and levels. Second, this list was used to generate a protocol for a formative evaluation using a qualitative design,[19 20] which is the subject of a separate publication.[21] This involved 10 community focus groups consisting of a total of 65 people who had

previously used STI-testing services. Groups were quota sampled based on age, sexual identity and sex. Lastly, candidate themes/attributes (table 1: web extra) were prioritised if potential policy solutions existed that could in theory at least be operationalised.[20] For example, the qualitative study highlighted the importance of more comprehensive testing, which could be provided given increased resources. On the other hand, while 'friendly staff' was also identified as an important issue, it was excluded from the design as it is less clear how it can be achieved even with extra resources. Consideration was also given to the inclusion of a cost attribute since it allows the monetary valuation of benefits.[16] However, it was also excluded from the final DCE design as strong objections to the notion of 'cost' in the context of STI testing were raised in most of the focus groups. By the end of the process, and with general regard to overall questionnaire burden, six attributes were chosen, three with two levels and three with four levels (table 1). The final format required participants to indicate which of two service options they preferred, 'A' or 'B' (table 2).

Experimental design

A fractional factorial design was used in order to limit the number of questions participants were required to complete.[19] It was generated using the Kuhfeld SAS macro[22] ensuring that the design had orthogonally balanced levels and minimal overlap,[19] resulting in 16 different service options (known as choice sets). The alternative options to these choice sets were constructed using the 'fold over' approach, ensuring a 100% statistically efficient design.[19 23] To reduce the number of questions, individuals were required to complete, the 16 choice sets were (non-randomly) halved using the SAS 'mktblock' macro.[22] A second version of each questionnaire was also generated in which the questions appeared in a different randomly chosen order. Finally, a single test of consistency (in which one option was logically superior to the other) was added to each version of the questionnaire in order to gauge how difficult participants found the DCE task. This meant that each individual was required to answer a total of nine DCE questions, eight main DCE questions and a consistency test. While DCEs sometimes contain more than a single consistency question, one was considered proportional given the modest number of DCE questions. Respondents also provided general background information such as sex, age, maximum educational qualification, sexual preference, frequency of previous STI tests and presence of STI symptoms.

Study recruitment

Non-commercial STI testing centres in East Sussex, England, participated in the study between January and June 2010. Fourteen centres agreed to recruit users, including four GUM clinics, six locally enhanced services (LES), a contraceptive advice and sexual health (CASH) service and three non-NHS 'community-based' centres (two young people's services and a Terrence Higgins Trust centre). CASH centres offer a broader range of sexual health services than STI testing such as family planning. LES's are typically primary care services that offer increased levels of STI testing with staff who are more likely to be GUM trained but not specialists.

Individuals seeking a STI test were verbally asked to participate in the study by either a researcher or member of staff and to complete the questionnaire before leaving. Participants had to be at least 16 years of age and provide written consent. Where centres held clinics at different times of the week, efforts were made to collect questionnaires at a variety of times. No attempt was made to calculate the number of users who declined to

Table 1 Preferences for STI testing characteristics, expressed as ORs

Attributes and levels	Unadjusted ORs	p Value	Adjusted ORs*	p Value
Time to appointment				
Drop in same day and wait	1.36 (1.28 to 1.45)	<0.001	1.36 (1.27 to 1.45)	<0.001
Within 24 h	1.27 (1.21 to 1.35)	<0.001	1.27 (1.20 to 1.35)	<0.001
Within 48 h	1.0	–	1.0	–
After 48 h but at individuals convenience	1.06 (1.00 to 1.11)	0.027	1.04 (0.99 to 1.10)	0.11
Results waiting time				
Same day	1.61 (1.52 to 1.72)	<0.001	1.65 (1.55 to 1.77)	<0.001
3 days	1.24 (1.18 to 1.31)	<0.001	1.26 (1.19 to 1.33)	<0.001
7 days	1.0	–	1.0	–
21 days	0.63 (0.59 to 0.66)	<0.001	0.62 (0.58 to 0.65)	<0.001
Comprehensive of results				
Positive results only	1.0	–	1.0	–
Positive and negative results	1.25 (1.21 to 1.28)	<0.001	1.24 (1.21 to 1.29)	<0.001
Staff				
Staff without specialist STI knowledge	1.0	–	1.0	–
Staff with specialist STI knowledge	2.55 (2.47 to 2.63)	<0.001	2.64 (2.56 to 2.73)	<0.001
Comprehensiveness of testing				
Tests for most STIs†	1.0	–	1.0	–
Tests for all STIs	2.19 (2.12 to 2.25)	<0.001	2.23 (2.16 to 2.31)	<0.001
Results reporting method				
Phone up test centre	1.0	–	1.0	–
Post to home address	0.82 (0.78 to 0.86)	<0.001	0.81 (0.77 to 0.86)	<0.001
By email	0.94 (0.88 to 1.00)	0.036	0.94 (0.88 to 1.00)	0.055
Text or call to mobile phone by centre	1.02 (0.97 to 1.08)	0.48	1.00 (0.95 to 1.06)	0.97

Figures in brackets represent 95% CIs. For the main unadjusted model: constant, OR 0.70 (0.68 to 0.72), log-likelihood =−14 047, no. of observations = 26 538, no. of groups (participants) =3355, average no. of DCE questions completed per participant =99%, $\rho=3.90\times10^{7}$, p=0.49, McFadden's adjusted r^2=0.22, the model predicts 74% of answers correctly.
*Adjusted for age, sex, CASH, MSM, no. of previous tests, symptoms of STIs, educations and employment status.
†Excluded tests were syphilis, herpes and HIV.
DCE, discrete choice experiment; MSM, men who have sex with men; STI, sexually transmitted infection.

Table 2 Example of a DCE question

	Service A	Service B
How long you have to wait for an appointment after first contacting the service	An appointment at your convenience **after** 48 h	Drop in the same day and wait
Who conducts your tests	A doctor or nurse **WITHOUT** specialist STI knowledge	A doctor or nurse **WITH** specialist STI knowledge
How long after being tested before you get your results	Wait 3 days for results	Wait 7 days for results
How you get your test results	Get results by email	Get results by post to your home address
Which test results you get	You are told test results ONLY IF you have an infection (Positive results only)	You are told all test results whether you have an infection or not (Positive and Negative results)
How many STIs you are tested for	Most STIs are tested for **but not** syphilis, herpes and HIV	**All** STIs are tested for **including** syphilis, herpes and HIV

Respondents were asked to indicate whether they preferred service A or B.
DCE, discrete choice experiment; STI, sexually transmitted infection.

participate, as estimation methods proved unreliable given the number of clinics and different staff involved. Therefore, we recruited a convenience sample.

Statistical analysis

The data were analysed using random effects logistic regression analysis to account for multiple responses per participant, using STATA version 12.[24] The six attributes were specified as 12 dummy variables as they were all categorical. The results are presented as unadjusted and adjusted ORs; the latter consisting of adjustments for demographic variables such as age, sex and employment status. The basic preference (or 'utility') function was assumed to be linear and additive.

A second objective was to assess whether preferences differed according to a number of basic demographic and background characteristics. To do this, a series of logistic regression analyses were undertaken in which each of the main DCE variables was interacted with the following: age, sex, presence of symptoms, whether CASH attendee, men who have sex with men (MSM), employment status and maximum educational qualifications. The results from these analyses were used to identify variables that independently predicted the levels on at least one DCE variable (data not shown but available on request). These associations are shown by reporting stratified ORs for a number of the subgroups of interest.

Three tests were undertaken in order to assess how 'well/logically' respondents completed the DCE questions. First, the direction of preference for each attribute was assessed against prior expectations. For example, if the questionnaires were answered logically, then all else equal individuals are more likely to prefer shorter to longer waiting times for test results. Second, the percentage of questionnaires in which dominance occurred was reported (ie, where respondents consistently appeared to base responses on the same level on one attribute rather than the levels on all six).[16] Lastly, data for participants who answered the consistency question illogically were excluded in a sensitivity analysis.

RESULTS

Respondent characteristics

A total of 3358 participants returned a questionnaire (table 3). Their mean age was 26 years (SD 9.4), 58% were women, 82% were heterosexual and almost 20% reported currently having a STI-related symptom. Over 70% of respondents were GUM attendees, and the majority of the remaining participants were from the CASH centre.

There were a number of differences in terms of the type of person who tested at each location. For example, CASH attendees were generally younger, more likely to be women with lower educational qualifications compared with GUM attendees. Logistic regression suggested that younger individuals were more likely to complete the questionnaire compared with older individuals ($z=-1.97$, $p=0.05$). No other demographic/location variables were found to be predictive of completeness of response.

Patient preferences

The responses were generally consistent with logical expectations (table 1). For example, people preferred shorter to longer waiting times for test results. Ninety-two per cent of respondents answered the consistency question 'logically' and 99% of the DCE questions were completed. The tests for dominance revealed that 13% of individuals always chose to see specialist rather non-specialist staff and 13% always chose to 'drop in and wait' for an appointment. The percentage of dominant responses for the remaining attributes was negligible. The model predicted 74% of choices correctly with a McFadden's adjusted R^2 of 0.22.

The results showed that the most important attributes to users were whether 'staff had specialist STI knowledge' compared with 'not having specialist knowledge' and the 'comprehensiveness of testing' (table 1). For example, the odds of respondents choosing clinics staffed by people with specialist STI knowledge was 2.55 (95% CI 2.47 to 2.63) times higher than the odds of choosing centres that were not, whereas the odds of choosing a site that tested for all STIs was 2.19 (95% CI 2.12 to 2.25) times higher than the odds of choosing a site that tested for some infections. The results also showed that, on average, 'dropping in and waiting' was the most preferred appointment system (OR 1.36; 95% CI 1.28 to 1.45) and that individuals preferred to receive test results on the same day (OR 1.61; 95% CI 1.52 to 1.72). A text or call to a mobile phone from the clinic was the most preferred results' notification option. Excluding questionnaires with a 'failed' consistency question and controlling for differences in variables such as age and sex had negligible effects on the results.

All the patient characteristics were significantly associated with at least one DCE variable. However, 'staff knowledge' and the 'comprehensiveness of testing' consistently remained the two most important attributes in terms of order, as they were always associated with the highest ORs (table 4). While they were of concern to all users, the results showed that women (OR 3.02; 95% CI 2.88 to 3.17), CASH attendees (OR 5.32; 95% CI 4.89 to 5.78) and non-MSM (OR 2.76; 95% CI 2.66 to 2.86) placed particular importance on staff with specialist knowledge compared with the remaining respondents, whereas the comprehensiveness of testing was particularly important to MSM (OR 2.94; 95% CI 2.67 to 3.22) compared with non-MSM (OR 2.13; 95% CI 2.06 to 2.21). The order of importance of the

Table 3 Response characteristics (n=3358)

Characteristic	Total N	Missing	Comm	GP	GUM	CASH	p Value
Percentage of total	3358		2.5%	3.5%	70.5%	23.5%	
Mean age in years (SD)	25.9 (9.4)	2%	30.8 (8.8)	25.4 (7.0)	27.4 (9.9)	21.4 (6.0)	<0.001*
Sex		1%					
Female	58%		15%	79%	53%	72%	<0.001†
Ethnicity		1%					
White	90%		99%	90%	90%	88%	
Other	10%		1%	10%	10%	12%	<0.001†
Sexual preference		2%					
Heterosexual	82%		20%	89%	80%	95%	
Homosexual	13%		71%	3%	14%	4%	
Bisexual	4%		7%	8%	5%	1%	
Prefer not to say	1%		2%	0%	1%	0%	<0.001†
Highest qualification		2%					
None	8%		4%	1%	7%	14%	
GCSE/O level	25%		16%	11%	21%	41%	
A level	24%		27%	23%	24%	25%	
NVQ/City & Guilds	5%		5%	3%	6%	3%	
Diploma	8%		10%	12%	9%	4%	
Degree	20%		16%	40%	23%	9%	
Post-graduate	8%		23%	10%	10%	3%	<0.001†
Employment		2%					
Student	31%		18%	35%	28%	40%	
Employed	49%		54%	42%	49%	48%	
Self-employed	9%		10%	6%	11%	4%	
Unemployed	8%		2%	10%	9%	7%	
Retired	1%		0%	1%	1%	0%	
Other	2%		1%	5%	3%	1%	<0.001†
No. of previous STI tests		3%					
None	53%		31%	49%	48%	79%	
1	31%		43%	30%	32%	27%	
2	11%		14%	16%	13%	3%	
>2	5%		12%	5%	7%	1%	<0.001†
Previous STI treatments		3%					
None	80%		74%	89%	77%	89%	
1	16%		24%	10%	18%	10%	
2	2%		1%	1%	3%	1%	
>2	2%		1%	0%	2%	0%	<0.001†
Believes has STI symptoms		6%					
Yes	19%		14%	14%	24%	8%	<0.001†
Completed DCE questions	29 859	1%					—

Some numbers do not sum exactly to 3358 or 100% due to missing values and/or rounding.
*Kruskal–Wallis.
†χ^2; Comm, community; CASH, contraceptive advice and sexual health service; GUM, genitourinary medicine; GP, general practice. DCE, discrete choice experiment; STI, sexually transmitted infection.

other DCE variables remained reasonably consistent across the different subgroups. For example, 'dropping in and waiting' and a 'text or call to a mobile phone' generally remained the preferred appointment and results reporting methods, respectively. However, some were shown to be of particular importance to specific subgroups. For example, there was some evidence to suggest that CASH attendees (OR 1.47; 95% CI 1.36 to 1.59) and women (OR 1.30; 95% CI 1.25 to 1.36) preferred receiving all test results rather than positive results only compared with non-CASH attendees (OR 1.20; 95% CI 1.16 to 1.24) and men (OR 1.17; 95% CI 1.12 to 1.23), respectively.

DISCUSSION

The results from this discrete choice experiment demonstrate that the most important issues to people testing for STIs are the comprehensiveness of testing and whether centres are staffed by STI specialists. While the absolute strength of preference for these attributes varied by subgroup, they remained the issues of most importance throughout. The results also suggest that users would generally prefer to 'drop in and wait' for tests compared with the remaining appointment systems and that there was a strong preference for receiving test results on the same day. While users also preferred to receive negative and positive test results rather than positive results alone (no news is good news), this was of particular importance to people testing at CASH centres and women. A text or call to a mobile phone from the test site was generally the most preferred method of receiving results.

The major strengths of this preference study are its large sample size and discrete choice design. This approach is more realistic than simply asking people what they prefer as it requires choices to be made, and it also allows the relative strength of different service characteristics to be assessed.

Table 4 Subgroup preferences for STI testing characteristics

	MSM*, OR (95% CI)		CASH†, OR (95% CI)		Age‡, OR (95% CI)			Sex§, OR (95% CI)	
Attributes and levels	**Yes**	**No**	**Yes**	**No**	**<25**	**≥25 and ≤45**	**45+**	**Male**	**Female**
Time to appointment									
Drop in same day and wait	1.58 (1.32 to 1.90)	1.30 (1.21 to 1.40)	1.17 (1.00 to 1.38)	1.38 (1.28 to 1.49)	1.42 (1.30 to 1.55)	1.23 (1.11 to 1.37)	1.58 (1.15 to 2.19)	1.36 (1.23 to 1.50)	1.35 (1.23 to 1.48)
Within 24 h	1.36 (1.16 to 1.60)	1.26 (1.18 to 1.34)	1.06 (0.92 to 1.23)	1.33 (1.24 to 1.42)	1.30 (1.20 to 1.41)	1.22 (1.11 to 1.35)	1.42 (1.06 to 1.90)	1.29 (1.19 to 1.41)	1.26 (1.16 to 1.37)
Within 48 h	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
After 48 h but at individuals convenience	1.13 (0.98 to 1.30)	1.02 (0.96 to 1.07)	1.07 (0.94 to 1.21)	1.02 (0.97 to 1.08)	1.11 (1.03 to 1.19)	0.96 (0.88 to 1.04)	0.96 (0.76 to 1.21)	1.06 (0.98 to 1.14)	1.03 (0.96 to 1.10)
Results waiting time									
Same day	1.74 (1.44 to 2.09)	1.66 (1.55 to 1.79)	1.24 (1.06 to 1.45)	1.78 (1.65 to 1.92)	1.65 (1.51 to 1.80)	1.59 (1.42 to 1.77)	2.31 (1.68 to 3.19)	1.66 (1.51 to 1.84)	1.65 (1.51 to 1.81)
3 days	1.19 (1.02 to 1.38)	1.27 (1.20 to 1.35)	1.06 (0.93 to 1.22)	1.30 (1.22 to 1.39)	1.25 (1.16 to 1.35)	1.25 (1.14 to 1.36)	1.40 (1.09 to 1.80)	1.24 (1.15 to 1.35)	1.26 (1.17 to 1.36)
7 days	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
21 days	0.59 (0.51 to 0.70)	0.63 (0.59 to 0.66)	0.66 (0.58 to 0.76)	0.59 (0.56 to 0.63)	0.60 (0.55 to 0.65)	0.64 (0.58 to 0.70)	0.62 (0.49 to 0.79)	0.64 (0.59 to 0.69)	0.60 (0.55 to 0.64)
Comprehensive of results									
Positive results only	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Positive and negative results	1.15 (1.05 to 1.26)	1.27 (1.22 to 1.31)	1.47 (1.36 to 1.59)	1.20 (1.16 to 1.24)	1.25 (1.20 to 1.30)	1.25 (1.19 to 1.32)	1.21 (1.04 to 1.40)	1.17 (1.12 to 1.23)	1.30 (1.25 to 1.36)
Staff									
Without specialist STI knowledge	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
With specialist STI knowledge	1.98 (1.81 to 2.18)	2.76 (2.66 to 2.86)	5.32 (4.89 to 5.78)	2.18 (2.10 to 2.27)	2.90 (2.79 to 3.03)	2.36 (2.23 to 2.49)	2.38 (2.02 to 2.80)	2.23 (2.12 to 2.34)	3.02 (2.88 to 3.17)
Comprehensiveness of testing									
Tests for most STIs¶	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Tests for all STIs	2.94 (2.67 to 3.22)	2.13 (2.06 to 2.21)	2.12 (1.96 to 2.30)	2.29 (2.20 to 2.38)	2.06 (1.97 to 2.15)	2.49 (2.33 to 2.63)	2.68 (2.27 to 3.15)	2.21 (2.11 to 2.32)	2.26 (2.16 to 2.36)
Results reporting method									
Phone up test centre	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Post to home address	0.78 (0.67 to 0.90)	0.82 (0.78 to 0.86)	0.79 (0.70 to 0.90)	0.82 (0.77 to 0.87)	0.80 (0.74 to 0.85)	0.86 (0.79 to 0.94)	0.68 (0.54 to 0.85)	0.83 (0.77 to 0.89)	0.80 (0.74 to 0.85)
By email	0.85 (0.71 to 1.02)	0.96 (0.90 to 1.03)	0.91 (0.78 to 1.06)	0.95 (0.89 to 1.03)	0.95 (0.87 to 1.03)	0.97 (0.88 to 1.08)	0.64 (0.48 to 0.86)	0.90 (0.82 to 0.99)	0.97 (0.89 to 1.06)
Text/call to mobile phone by centre	1.08 (0.92 to 1.27)	1.00 (0.94 to 1.07)	0.91 (0.79 to 1.04)	1.04 (0.98 to 1.11)	1.02 (0.94 to 1.10)	1.01 (0.92 to 1.11)	0.82 (0.62 to 1.10)	1.00 (0.92 to 1.09)	1.00 (0.93 to 1.09)

*Adjusted for age, CASH, no. of previous tests, symptoms of STIs, education and employment status.
†Adjusted for age, sex, MSM, no. of previous tests, symptoms of STIs, education and employment status.
‡Adjusted for CASH, sex, MSM, no. of previous tests, symptoms of STIs, education and employment status.
§Adjusted for age, CASH, MSM, no. of previous tests, symptoms of STIs, education and employment status.
¶Excluded tests were syphilis, herpes and HIV.
CASH, contraceptive advice and sexual health services; MSM, men who have sex with men; 'No' refers to all other respondents; STI, sexually transmitted infection; 'yes' refers to MSM.

There are several limitations with the study. For example, the number of DCE attributes was limited to six. While the literature and qualitative analysis suggested that other issues were also important to people, such as 'friendly staff', including more attributes and levels would have significantly increased the number of questions, given the factorial design. Therefore, while the results are robust in terms of the relative preferences across the included attributes, it is less clear how they relate to other factors. Second, the focus was on people who were already engaged with STI testing services and the design meant that people were 'forced' to choose one of two service options. However, in a follow-on study using the same questionnaire but including an 'opt-out' option (data not shown) in a non-testing convenience sample (n=255), less than 1% of all responses indicated an unwillingness to test. Thus, there is some reason to believe that the service characteristics analysed in this study are unlikely to influence the likelihood of testing in the first instance. Third, while users indicated a strong preference for staff with specialist knowledge, the required policy response is less clear in so much that it could either involve increasing levels of staff training, ensuring users are fully informed about the skill levels of staff at different centres or both. Further research is required on this point. Fourth, a potential criticism is that the results could be influenced by individual's prior testing experiences. While this is possible, we think it unlikely to be important since the analysis adjusted for variables such as testing location, the DCE choices were between hypothetical services and over 50% of respondents had no prior testing experience. Moreover, even if this criticism is correct, the aim of the study was to estimate the strength of preference for different services characteristics rather than to assign some level of legitimacy to them. Lastly, the study does not take into account any personal or public health benefits of faster testing, other improvements to current services or their associated costs. Thus, while potential improvements in service provision have been identified from a 'user' perspective, they could be at odds with broader public health objectives such as reducing the likelihood of further transmissions. Further studies are required to evaluate these potential trade-offs.

Only a few studies have assessed preferences for STI testing services[10 12–14 25] and only three have used DCE type designs. The first, however, was a US study that focused on HIV testing and methods of providing samples rather than broader service characteristics.[10] Comparisons with the remaining two studies[12 14] are more relevant as they are UK based and asked a number of similar questions. For example, in their sample of 746 current GUM users and the general population, Ross *et al* reported that individuals were indifferent to seeing GPs or STI specialists, although some ethnic groups expressed a preference for GPs. While these results are seemingly different from ours, we focused specifically on STI testing, not sexual healthcare more generally. Ross *et al* also reported that less than half of the respondents preferred to drop in and wait compared with the remainder who would rather have a booked appointment within 48 h. Our results are different in that users indicating that they would generally prefer to drop in and wait rather than waiting 48 h for an appointment. It is difficult to know exactly why the findings differ but Ross *et al* stipulated a 2 h wait at drop in centres, whereas we did not specify a length of time. However, the results from both studies are similar in that they both indicate an increased willingness to drop in and wait with increasing appointment waiting times.

The results showed that CASH participants had much stronger preferences for a number of attributes compared with other respondents, despite adjusting for differences in presenting characteristics such as age. For example, CASH participants expressed particularly strong preferences for centres staffed by STI specialists (OR 5.32; 95% CI 4.89 to 5.78). While the precise reasons for these differences are unclear, CASH centres by definition deal with other sexual health issues alongside STI testing, including family planning and reproductive health. Thus, while all CASH participants received a STI test, this might not have been their only or primary motivation for seeking healthcare, and in this sense, they represent a distinct user group.

Most sexual health services in primary care are either provided at GPs or LES. LES's were primarily established to provide increased choice to individuals given the excess demand for GUM appointments.[26] Unlike GUM clinics, a typical LES will not test for all infections and is more likely to employ GUM-trained staff rather than specialists.[27] However, these results suggest that unless they offer other advantages to users over and above shorter appointment waiting times, most individuals will continue to test at GUM clinics given a choice.

The time it takes to receive test results is likely to depend on a number of factors including local service arrangements, the type of tests taken and the infections that are being investigated. However, our results suggest that where feasible, all people testing for STIs would highly value receiving their results on the same day.

In 2005, the UKs Department of Health established a Public Service Agreement to ensure access to GUM services within 48 h.[15] These results suggest that this objective might not be optimal from a user perspective as other appointment mechanisms were generally preferred and other issues were of greater concern.

In summary, the results from this study highlight particularly strong preferences for STI testing services that are staffed by people with specialist STI knowledge and sites that test for all infections rather than some. These findings remain unchanged despite adjusting for differences in characteristics such as age and where participants tested. They are perhaps of particular relevance if future policies continue to encourage more testing in primary care settings rather than GUM. They also suggest that a target based purely on a 48 h waiting time is misguided since it is neither the most favoured appointment mechanism nor the characteristic of most concern to users.

Key messages

- Users testing for STIs revealed particularly strong preferences for services staffed by specialist staff and sites testing for all infections.
- While the strength of preference for these two service characteristics varied by patient subgroup, they consistently remained the issues of most concern to users.
- Attempts to encourage more STI testing in primary care rather than GUM clinics should pay particular attention to these findings.
- Service targets based purely on waiting up to 48 h for an appointment are misguided from a user perspective.

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REFERENCES

1. **Miners AH,** Sabin CA, Mocroft A, *et al*. Health-related quality of life in individuals infected with HIV in the era of HAART. *HIV Clin Trials* 2002;**2**:484—92.
2. **Fisman DN.** Health related quality of life in genital herpes: a pilot comparison of measures. *Sex Transm Infect* 2005;**81**:267—70.
3. **Beck EJ,** Miners AH, Tolley K. The cost of HIV treatment and care: a global review. *Pharmacoeconomics* 2001;**19**:13—39.
4. **Beck EJ,** Mandalia S, Griffith R, *et al*. Use and cost of hospital and community service provision for children with HIV infection at an English HIV referral centre. *Pharmacoeconomics* 2000;**17**:53—69.
5. **Pultorak E,** Wong W, Rabins C, *et al*. Economic burden of sexually transmitted infections: incidence and direct medical cost of Chlamydia, gonorrhea, and syphilis among Illinois adolescents and young adults, 2005-2006. *Sex Transm Dis* 2009;**36**:629—36.
6. **The Health Protection Agency.** *Testing Times - HIV and other Sexually Transmitted Infections in the United Kingdom: 2007*. London: Health Protection Agency, Centre for Infections, 2007.
7. **Sohal H,** Creighton J, Figueroa J, *et al*. The impact of establishing a local-enhanced service for treating sexually transmitted infections in primary care. *Sex Transm Infect* 2008;**84**:235—8.
8. **Department of Health.** *Equity and Excellence: Liberating the NHS*. London: Department of Health, 2010. (White paper).
9. **MEDFASH.** *Standards for the Management of Sexually Transmitted Infections*. 2010. http://www.medfash.org.uk/Projects/BASHH_standards/Final_pdfs/Standards_for_the_management_of_STIs.pdf
10. **Phillips KA,** Maddala T, Johnson FR. Measuring preferences for health care interventions using conjoint analysis: an application to HIV testing. *Health Serv Res* 2002;**37**:1681—705.
11. **MEDFASH.** *Progress and Priorities—Working Together for High Quality Sexual Health: Review of the National Strategy for Sexual Health and HIV*. 2008. http://www.medfash.org.uk/publications/documents/Progress_and_priorities_working_together_for_high_quality_sexual_health_FULL_REPORT.pdf
12. **Ross J,** Copas A, Stephenson J, *et al*. Public involvement in modernising genitourinary medicine clinics: using general public and patient opinion to influence models of service delivery. *Sex Transm Infect* 2006;**82**:484—8.
13. **Griffiths V,** Ahmed-Jushuf I, Cassell J, *et al*. Understanding access to genitourinary medicine services. *Int J STD AIDS* 2004;**15**:587—9.
14. **Brown L,** Copas A, Stephenson J, *et al*. Preferred options for receiving sexual health screening results: a population and patient survey. *Int J STD AIDS* 2008;**19**:184—7.
15. **MEDFASH.** *Recommended Standards for Sexual Health Services*. 2005. http://www.dh.gov.uk/prod_consum_dh/groups/dh_digitalassets/@dh/@en/documents/digitalasset/dh_084615.pdf
16. **Ryan M.** Discrete choice experiments in health care. *BMJ* 2004;**328**:360—1.
17. **de Bekker-Grob EW,** Ryan M, Gerard K. Discrete choice experiments in health economics: a review of the literature. *Health Econ* 2012;**21**:145—72.
18. **Ratcliffe J,** Buxton M. Patients' preferences regarding the process and outcomes of life-saving technology. *Int J Technol Assess* 1999;**15**:340—51.
19. **Ryan M,** Gerard K, Amya-Amya M. Using discrete choice experiments to value health and health care. In: Bateman IJ, ed. *The Economics of Non-market Goods and Resources*. Dordrecht: Springer, 2008.
20. **Coast J,** Al-Janabi H, Sutton EJ, *et al*. Using qualitative methods for attribute development for discrete choice experiments: issues and recommendations. *Health Econ* 2012;**21**:730—41.
21. **Llewellyn CD,** Pollard A, Miners A, *et al*. Understanding patient choices for attending sexually transmitted infection testing services a qualitative study. *Sex Transm Infect*. Published Online First 24 May 2012. doi:10.1136/sextrans-2011-050344.
22. **Kuhfeld W.** *Market Research Methods in SAS*. Cary, NC, USA: SAS Institute Inc., 2010.
23. **Street D,** Burgess L, Louviere J. Quick and easy choice sets: constructing optimal and nearly optimal stated choice experiments. *Int J Res Mark* 2005;**22**:459—70.
24. **StataCorp.** *Stata Statistical Software Release 12*. College Station, TX: StataCorp LP, 2011.
25. **Hambly S,** Luzzi G. Sexual health services—a patient preference survey. *Int J STD AIDS* 2006;**17**:372—4.
26. **Yung M,** Denholm R, Peake J, *et al*. Distribution and characteristics of sexual health service provision in primary and community care in England. *Int J STD AIDS* 2010;**21**:650—2.
27. **Department of Health.** *The National Strategy for Sexual Health and HIV*. London: Department of health, 2001.

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Notes