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VALUING PATIENT EXPERIENCE FACTORS IN THE PROVISION OF CHLAMYDIA SCREENING

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Background

Chlamydia trachomatis is the most common curable sexually transmitted disease [1]. Chlamydia infection is asymptomatic in at least three quarters of women and half of men [2], however, once diagnosed, it can be treated with inexpensive antibiotics [3]. Without treatment Chlamydia can lead to pelvic inflammatory disease (PID) and subsequently ectopic pregnancy, tubal factor infertility, and chronic pelvic pain [4].

In Scotland almost 18,000 cases of Chlamydia were diagnosed in 2007, a 45% increase over the previous five years. Prevalence rates are highest among the 15-24 year olds. Genito-Urinary Medicine (GUM) clinics offer Chlamydia screening to all patients. Further the Scottish Intercollegiate Guidelines Network (SIGN) [5] recommend that patients younger than 25 years old who had two or more sexual partners in the past 12 months are offered screening in other health care

settings such as General Practice or Family Planning Clinics. In addition, a private screening test recently introduced in the UK, is available over the counter from pharmacies.

While a number of studies find that Chlamydia screening is not cost-effective (see [6] for a systematic review), these studies focus on how the diagnosis and treatment of Chlamydia affects patients' health outcomes, measured as the number of cases of PID detected, number ectopic pregnancies averted or number of infertility cases prevented. Yet, individuals may also value patient experience factors, such as the provision of information (positive or negative), screening location and method, and whether or not support is provided alongside the result. This study aimed to value these experience factors of Chlamydia screening, alongside health outcomes.

1. *Chlamydia trachomatis* is the most common curable sexually transmitted disease [1].

2. Studies finding that Chlamydia screening is not cost-effective, have focused on how treatment of Chlamydia affects patients' health outcomes. Yet, individuals also value patient experience factors.

3. There is general value in screening, which may reflect the value of information. Respondents preferred to be screened at the family planning clinic using a less invasive test and valued the support of a trained health care provider when receiving results.

4. Take-up in the population who attend clinical settings will be maximised by providing a less invasive test at the family planning clinic. Failure to consider experience factors could result in misleading recommendations regarding the efficiency of Chlamydia screening.

Key Messages



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Methods

Subjects were recruited from women attending a family planning clinic in Aberdeen. Those who agreed to participate in the study received an information sheet about Chlamydia and a questionnaire to complete while waiting for their appointment. The questionnaire elicited respondents' preferences for Chlamydia screening using a Discrete Choice Experiment (DCE) [7, 8]. Ethical approval for the study was granted by the Grampian ethics committee.

Five screening attributes were chosen to represent the range of different Chlamydia screening programmes throughout the UK. The attributes and levels are presented in Table 1, Columns 1 and 2. There are 384 possible attribute/level combinations or screening tests, experimental design techniques were used to reduce this to 16 screening tests. Each of the 16 tests was presented to respondents as a hypothetical test, and respondents were asked if they would be screened: possible responses were 'yes' or 'no'. An example choice is presented in Figure 1. (For more details about the study's design see [9] and [10].)

The data were analysed using logistic regression, with participant's choice as the binary dependent variable, and the attributes/levels as the independent variables. The following benefit equation was estimated:

$$B_{\text{screening}} = \alpha + \beta_1 \text{FPC} + \beta_2 \text{GP} + \beta_3 \text{GUM} + \beta_4 \text{Home} + \beta_5 \text{Urine} + \beta_6 \text{PS} + \beta_7 \text{FPE} + \beta_8 \text{Risk} + \beta_9 \text{Cost} + \beta_{10} \text{Support} + \beta_{11} \text{NoSupport} \quad (1)$$

B is the benefit derived from a given screening test and all labels are defined in Table 1. α is a constant term representing the overall benefit of being screened, regardless of the type of test. The coefficients β_1 to β_{10} show the relative importance of patient experience factors on choice of screening test: $\beta_1 - \beta_4$ for screening location; $\beta_5 - \beta_7$ for type of screening test; β_8 for a 1% increase in risk of PID if Chlamydia is untreated; β_9 for a £1 increase in the cost of screening and β_{10} the benefit of receiving test results with the support of a trained health care advisor. A priori it is hypothesised that β_8 will have a positive sign, indicating that respondents are more likely to be screened if their risk of PID is higher, β_9 will have a negative sign, indicating respondents prefer lower cost screening tests, and that the support attribute will have a positive sign indicating respondents prefer support when receiving results. No a priori assumptions were made about the effect of screening location or type of test on screening.

The advantage of the DCE method is being able to estimate the trade-offs that participants are willing to make between attributes: estimated as the ratio of any two coefficients and expressed in terms of the measurement unit of the denominator. When cost is included as the denominator marginal willingness to pay (WTP), a monetary measure of benefit, can be estimated for different screening attributes or programmes. For example, *assuming everything else equal*, respondents are willing to pay $-(\beta_1 / \beta_9)$ to have screening at the family planning clinic and $-(\beta_{10} / \beta_9)$ to have support when receiving their test results.

The results of the logistic regression can also be used to predict uptake rates for defined screening tests. The probability of take up, P_i , is calculated as:

$$P_i = 1 / [1 + \exp(-B_i)] \quad (2)$$

Where B is defined in equation 1 and i is a defined screening test. These probabilities can be used to compare predicted uptake rates for different screening tests offered in the UK. We compare four screening tests: an opportunistic screening test routinely offered in the family planning clinic, which is a free urine test with support; two tests used to assess the cost-effectiveness of Chlamydia screening in [6], these are either a urine test or a perineal swab, which patients do at home and return to the lab (both tests are free and support is provided); and the recently introduced over the counter screening kit, this is a urine test, which patients do at home and return to the laboratory, and support is provided by the pharmacist.

Results

One hundred and seventy-four questionnaires were completed. Of these 25 respondents did not complete any of the 16 DCE questions, leaving a sample size of 149. 83% of respondents were less than 25 years old; the target population for screening programmes. 52% of respondents were either single or in a casual relationship, and 13% had previously been diagnosed with Chlamydia.

Table 1, column 3 presents the DCE results. The positive and significant constant term indicates that respondents have a general preference for screening, all other things equal. The coefficients for general practitioner and GUM clinic locations are not significant, indicating that screening at these locations does not influence overall preferences for screening. The coefficient for screening at the family

Figure 1: Example of a DCE question

Place of Screening	Type of Screening	Cost to you of Chlamydia Screening	Chance of developing Pelvic Inflammatory Disease (PID) if not screened.	Type of Information and Support when you are given Screening Results	I would have Chlamydia Screening	I would not have Chlamydia Screening
At GP Clinic	Urine Test	£10	5%	None		

Table 1 Attributes, levels and results of DCE

Attributes and Levels		Coefficient	WTP Mean (£)	WTP 95% confidence interval†
Place of Screening	Family Planning Clinic (FPC): β_1^{\S}	0.377***	5.32	5.24 , 5.40
	General Practitioner (GP): β_2	0.096	†	†
	GUM Clinic (GUM): β_3	0.014	†	†
	Home: β_4	-0.295***	-4.14	-4.22 , -4.07
Type of Screening	Urine Test: β_5^{\S}	0.500***	7.09	7.02 , 7.16
	Perineal Swab (PS): β_6	-0.249***	-3.51	-3.57 , -3.45
	Full Pelvic Examination (FPE): β_7	-0.250***	-3.58	-3.64 , -3.52
Risk of PID (%)	(0%, 5%, 10%, 25%) (Risk): β_8	0.002	†	†
Cost of Screening (£)	(£0, £5, £10, £25) (Cost): β_9	-0.071***	.	.
Support of a trained healthcare advisor	Yes: β_{10}	0.304***	4.26	4.22 , 4.31
	No: β_{11}^{\S}	-0.304***	-4.26	-4.22 , -4.31
Constant		1.082***	15.23	15.15 , 1531
Number of Observations		2142		
Number of Respondents		149		
χ^2 (df)		205.83		
McFadden's R ²		0.074		

*** denotes significance at the 99% confidence level

† Attribute levels not significant, thus WTP not significantly different from zero

\S Using effects coding L-1 levels are calculated using the regression model, the missing level can be obtained using the formula, $\beta_4 = (-1 \times \beta_1) + (-1 \times \beta_2) + (-1 \times \beta_3)$. Further the standard error of the missing level is calculated as the average of the L-1 parameters, thus permitting the calculation of † statistics.

planning clinic is significant and positive, indicating that this location increases the general preference for screening, while the coefficient for screening at home is significant and negative, indicating that this location decreases the general preference for screening. Having a urine test and the support of a trained health care advisor are both significant and positive, whereas more invasive screening tests (perineal swab and full pelvic examination) have a negative impact on the preference for screening. As expected, the coefficient for the cost of screening is significant and negative, implying that respondents prefer tests that have a lower cost. The risk of PID is not significant, and consequently is not considered in the probability and WTP calculations.

Table 1, columns 4 and 5 show marginal WTP for a unit change in each attribute. These results echo those reported above. Respondents are willing to pay £15.23 for a screening test before WTP for the other attributes of screening are taken into account. If the screening test is at the family planning clinic the WTP increases by £5.31, similarly a urine test increases WTP by £7.09, and having the support of a trained health care advisor, when receiving their results increases respondents willingness to pay by £4.26. Conversely, screening at home reduces WTP by £4.14, and screening with a perineal swab or full pelvic examination reduces WTP by £3.50 and £3.57, respectively.

Using this model it is possible to estimate WTP for the recently introduced over the counter screening test as described above:

$$WTP_{screening} = -[(\alpha + \beta_4 Home + \beta_1 Urine + \beta_{10} Support) / \beta_9] \quad (3)$$

Thus WTP equals £22.44 when the data was collected in 2002, this is equivalent to £27.35 in 2008 prices. This kit, from a major UK chemist chain, is priced at £24.47.

The uptake rate for the screening test offered at the family planning clinic using a urine test and with the support of a trained health care advisor is predicted to be 91%. This is higher than the predicted uptake rates of the less desirable tests considered in previous cost-effectiveness analyses [6], which were 83% for a home urine test and 70% for the home perineal swab. The predicted uptake of the over the counter test is 45%, which is lower than the predicted uptake rates for the NHS provided tests, reflecting the negative effect of the cost of the test.

Discussion

This study elicited preferences of the target screening population for characteristics of Chlamydia screening tests. There is general value in screening, which may reflect the value of information. Respondents preferred to be screened at the family planning clinic using a less invasive test and valued the support of a trained health care provider when receiving results. They were willing to pay for these components of a screening test, suggesting future evaluation studies should consider them. While questions remain concerning the validity of responses to hypothetical questions, the values generated from our model were only slightly higher than the real price of a screening test from the chemist. This is consistent with validity since the market may not be extracting maximum WTP. Furthermore as reported elsewhere, we found that 80% of participants responded to the real offer of a screening test

in a manner consistent with their responses to the hypothetical questions i.e. said yes (or no) to both the hypothetical and real choices [9]. These results suggest respondents answer truthfully, but future work is required to establish why 20% of respondents gave different answers.

Cost-effectiveness studies targeting high risk groups using "mail from home" tests find that screening is not cost effective [6]. We find "at home" screening is the least preferred location for our respondents. This result is consistent with a review of screening outside "clinic" settings, which found lower uptake for home based screening [11]. An additional complication of home based screening is low return rates for distributed screening kits [12]. Our results suggest that take-up in the population who attend clinical settings will be maximised by providing a less invasive test at the family planning clinic. We argue that such tests may be cost-effective, and failure to take account of factors, referred to here as experience factors, could result in misleading recommendations regarding the efficiency of Chlamydia screening.

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