Estimating benefits of introducing a rapid STI testing service for women using time-driven activity-based data

Horner P^{1,2}, Crofts M², North P³, Steer J³, Turner J³, Wheeler H², Hartman C², Warr L², Mohiuddin S¹, Muir P³

¹University of Bristol, ²Unity Sexual Health Centre, ³Public Health England South West Regional Laboratory, Bristol, United Kingdom

Background: Sexual health services are under increasing pressure to improve the patient experience yet reduce costs. The introduction of rapid diagnostic testing may address these goals as well as reduce the risk of antimicrobial resistance (AMR) from unnecessary antibiotic prescribing.

Methods: Unity Sexual Health manages approximately 10,000 women per annum through its open access sexual health service; of whom approximately 5000 are asymptomatic, 4500 have contraception needs and 3000 symptomatic women require a speculum examination, of whom 33% have pelvic pain. A multidisciplinary approach to care is delivered through a mixture of doctors in training and nurses supported by a senior clinician. A time-driven activity-based costing (TDABC) model^{1,2} for all women attending our clinic was developed using data from 365 consecutive female electronic patient records and used to develop a care pathway model for female attendances which contains real data on the probability of a patient progressing to the next “activity”. The current model (Figure 1) consists of activities a female patient may experience and the transition probabilities of a client through the pathway between these activities. An activity consists of the associated ‘Staff’ and ‘Consumables’ costs which were based on recent estimates from the literature^{2,3} and time taken was estimated using data on the number of patients seen per clinical session. For simplicity, only nurse band 6/7 were considered as the clinician with a staff cost per minute (£0.89) which included indirect and overhead costs. Patient time and associated costs were excluded. The cost of chlamydia (CT) /gonorrhoea (NG), trichomonas (TV) and *Mycoplasma genitalium* (MG) NAATs were assumed to be £12.51, £7.62 & £7.62 and NG and trichomonas culture £7.55 & £7.93, respectively. Packaging and posting for online NAAT testing was £2.00 which doubled if HIV and syphilis testing was also undertaken. (See poster 238 on estimating the benefits for symptomatic men)

The effect on the care pathway after the introduction of rapid STI testing service with the Hologic Panther was based on expert review of the literature with the number of CT/NG NAATs, HIV and syphilis tests and contraceptive consultations remaining unchanged. (Figure 2) The Hologic Panther, in a clinic environment could provide a NAAT result for a patient self-test in 4 hours for chlamydia and gonorrhoea, with targeted testing for trichomonas (TV) in symptomatic women with vaginal discharge and/or irritation and MG in women with pelvic pain or post coital bleeding.^{3,4} Women would provide a self-taken vaginal swab for testing and would then be reviewed by the clinician with the NAAT result and result of microscopy for bacterial vaginosis and candida. Asymptomatic women would be offered the opportunity to self-test using an online service. TV culture and GC culture would be discontinued except if GC NAAT-positive.

The cost of providing care for 10,000 women was then estimated with the model summing the costs of all the activities using a recently developed programme *Healthcare Optimisation Planner*

Results: For symptomatic women speculum examinations would be reduced by 66% (3000 to 1000) and it was assumed there would be 2000 (20%) fewer consultations due to online testing, with an overall 8% reduction in costs from £1.11 to £1.02 million. Based on number and cost of tests there was a slight decrease in diagnostic costs from £369,000 to £365,500 despite introducing targeted TV and MG NAAT testing primarily due to discontinuing TV and NG culture. The model did not estimate the cost savings due to fewer follow-up visits which would be likely to further increase the ability to see more patients with the same resources.

Conclusion: The introduction of a rapid STI testing service is likely to be cost effective and improve the patient experience with early knowledge of their results, fewer invasive tests and less follow-up visits as a result of receiving the correct initial treatment. This is also likely to improve partner notification rates and reduce risk of AMR.

References: 1) Price C et al *HSMR* 2018;**31**:43; 2) Adams E et al *BMJ Open* 2014;**4**:e005322 3) Nicholls J et al. *STI* 2018;**94**:93b 4) Wiesenfeld H et al. *JID* 2017;**216**(S2):S389

Figure 1: TBACD model of current female care pathway. Boxes represent “activities” with patient numbers in () and numbers in bold represent probability of next activity happening

Figure 2: TBACD model a new rapid female care pathway at Unity using the Hologic Panther based on expert review of the literature