Written evidence from University Hospitals Bristol NHS Foundation Trust

Using intelligent service re-design to improve the effectiveness, cost effectiveness and acceptability of sexual health services in Bristol North Somerset and South Gloucestershire (BNSSG).

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This document describes seven new major integrated service developments at various stages of implementation and the underpinning evidence base, which will enable Unity to improve the sexual health of BNSSG despite a reduction in resources. These have the potential to be adopted by other localities. Evaluation of these new developments will strengthen the evidence to support their introduction elsewhere.

Executive summary

UH Bristol was recently successful (2017) in winning the tender to provide sexual health services for BNSSG – Unity Sexual Health. Unity not only delivers more cost-effective sexual health care but the patient experience has been improved. This required an innovative service redesign which has been made possible through advances in information technology and diagnostics in collaboration with Public Health England (PHE). It is the integration of these technologies to develop the new service, supported by the time-driven activity-based cost (TDABC) and modelling tool which enabled UH Bristol and PHE to commit to provide such a service. Resources made available through service re-design are being used to introduce new innovations. However, an important consideration when doing this is the initial resource investment required to change care pathways and introduce new technologies.

Service innovations:

1)Redesigned website as a single point of access. This promotes self-management through the use of HIV and sexually transmitted infections (STI) self-testing kits and on-line information, including videos, containing complex but frequently required information on contraception, and STIs.
2) Online STI postal testing delivered in collaboration with Public Health England South West Laboratories

3) Introduction of a rapid sexual health service using Nucleic Acid Amplification Tests (NAATs) in Bristol. This is the first such service model for sexual health care delivery in the world.

4) Improved patient care pathway management through introduction of on-line registration to a system with electronic patient record system which will also enable patients to provide basic clinical information prior to a consultation and be directed to relevant information on the Unity website.

5) Development of an integrated enhanced intelligence surveillance system

6) System wide partner notification (PN) service to support primary care

7) Improved provision of new NAAT diagnostics in primary care.

These service innovations will result in:

a) Major changes to care pathways resulting in reduction in healthcare professional interaction with less complex patients and reducing the overall time required by healthcare professionals to deliver effective care. It is anticipated this will result in:
   a. Improvement in the quality of care provided with fewer invasive examinations in symptomatic patient and reduced number of follow-up visits.
   b. Delivery of infection specific treatment with reduction in unnecessary use of antimicrobials improving anti-microbial stewardship.
   c. Increased uptake of screening by high risk groups, a PHE priority
   d. Improved partner notification
   e. Continued ability to continue deliver high quality sexual health advice and care to those most in need.
   f. Enhanced staff satisfaction

These will be evaluated by NIHR CLAHRC West and NIHR Health Protection Research Unit (HPRU) Evaluation of Interventions

b) Enhanced surveillance and analysis of “routinely” collected data to enable:
   a. Improved targeting and evaluation of National Chlamydia Screening Programme (NCSP) at a local level.
c. Evidence based on-line guidance for health-care professionals on STI diagnostic testing and screening.

The NIHR HPRUs in Evaluation of Interventions and Modelling Methodology are involved in developing the methodology.

**Background**

1. BNSSG services were put out to tender in 2016 and UH Bristol was recently successful (2017) in winning the tender to provide sexual health services for BNSSG – forming Unity Sexual Health. ([https://www.unitysexualhealth.co.uk/](https://www.unitysexualhealth.co.uk/)) Conditional within the tender was that the new service would have a central point of access and would reduce STIs, late HIV diagnoses and teenage pregnancies and increase long-acting contraception provision but funding would be effectively reduced by 20% over 5 years. This required not only a major service re-configuration with Unity leading a partnership of other organisations but also an innovative redesign of how sexual health services are delivered across BNSSG. This has been made possible through implementing new concepts about how to integrate advances in information technology and diagnostics in collaboration with Public Health England (PHE) and the University of Bristol. It is the integration of these technologies to develop the new service, supported by time-driven activity-based costing modelling which enabled UHBT and PHE to commit to provide such a service.

2. Accessing information using smart phones and other digital devices now plays a role in the daily life of the majority of people in the United Kingdom. Organisations use client friendly interactive websites to promote access and facilitate communication and this is becoming the routine in the delivery of health care services. Published work has also shown that the provision of videos can enhance communication of SH prevention messages and complex medical information.([1, 2]) Such an interface also provides the opportunity to provide access to on line STI and HIV testing which has been demonstrated to increase uptake and can be used to complement existing face-to-face services.([3])

3. Patients want the results of their STI and HIV tests available as soon as possible and such a service would increase uptake of STI and HIV testing in high risk groups as evidenced by the success of Dean Street Express which provides results within 6 hours for asymptomatic patients. The O’Neill 2016 report on tackling drug resistant infections globally identified that
rapid diagnostics would reduce the use of antibiotics. As doctors will know if a patient has an infection and antibiotics will only be given to the patients that need them, the report therefore recommends the rapid introduction of such technology. These technologies enable accurate NAAT STI results within 30 minutes. However these technologies are more expensive and although likely to be cost effective may not be cost saving.\(^4,\,\,5\) The additional costs of the new technology could be partially offset by re-designing the care pathway.\(^6\) Currently symptomatic patient are first seen by the clinician and then require examination with invasive testing to obtain tests for microscopy, with initial treatment decisions based on this 1960’s technology with revisions being made once NAAT results are available 1-2 weeks later. Having the results available, using self-taken specimens before they see the clinician, at the time of consultation would reduce the need for invasive examinations in many patients and thus the duration and cost of a consultation. Another option would be to utilise the improved user interface of current STI NAAT testing platforms which would enable clinics to directly perform testing in the clinic which have a turn around time of 3 hours. This would reduce costs of a rapid STI service \(^6\) but may only be practical in large clinics and it is uncertain symptomatic patients would wait for their results so that treatment decisions could be better informed. However, there is evidence to suggest patients would wait given current time spent at clinics and experience that if patients are informed as to why they must wait, such a wait is likely to be acceptable for the majority of patients.

4. Developments have also occurred in electronic patient record (EPR) in sexual health with online registration using a password protected secure accounts. These will have the ability for patient to record information currently collected at registration in the clinic and during the consultation, to be sign posted to relevant information on Unity website and obtain results. Such a system when integrated with a rapid STI service would facilitate the introduction of self-testing prior to a consultation and potentially further reduce the time spent with a clinician. These EPR system will continue to evolve.

5. PHE currently collects and analyses a considerable amount of information about sexual health which is provided to the public via its fingertips website at a local authority level and to commissioners and providers through laser reports. The later contains data at the Lower Super Output Areas (LSOAs). Great care is taken to ensure deductive disclosure of patient identities is not possible. However there is currently no information available locally on
chlamydia testing coverage and positivity which recent work in Bristol suggests varies considerably by medium super output area (MSOA) and it is unknown why this is.\(^7\) Untreated chlamydia has a 17% risk of pelvic inflammatory disease (PID), which has about a 3% (2.5% -4) risk of infertility if treated appropriately and chlamydia screening can reduce the incidence of PID.\(^8\) Understanding how best to target women and men at high risk of chlamydia could potentially improve the cost effectiveness of screening. In addition, current STI testing data only provides a measure of test positivity in those being tested and is not a measure of population prevalence. However, there is evidence that modelling can be potentially used to estimate prevalence from routinely collected data if additional information on risk behaviour and reason for testing is included in submitted with routine surveillance data.\(^9\) It is likely that providing detailed information at the MSOA/LSOA level on a wide range of sexual health parameters such a chlamydia prevalence, teenage pregnancy, long acting reversible contraception (LARC) uptake and safe guarding could inform development and evaluation of a multi-agency approach to reducing sexual health morbidity in areas of highest need even in an environment where finances are being squeezed. This will include links with the new Relationships and Sex Education teaching programmes in Schools to ensure that they are informed by local data.

6. Effective partner notification is an essential part of managing sexually transmitted infections. Many STIs, in particular chlamydia, are diagnosed in primary care and may not be managed optimally. If ineffectively managed this can lead to costly sequelae. Providing effective treatment is challenging for GPs. For example, partner treatment is difficult for GPs if the partners aren’t their patients. Treatment may involve antibiotic injections, which are hard to arrange for GPs. Above all GPs are increasingly stretched and busy. The University of Bristol recently completed a pilot study that suggested patients, GPs and nurses would like a team of specialist nurses from Unity Sexual Health to deliver patient care over the phone. We want to introduce and evaluate such a service in Bristol.

7. New and better performing diagnostic tests for genital tract infections are continuously becoming available. For example, there are now NAAT tests for bacterial vaginosis and *Trichomonas vaginalis* which historically were difficult to accurately diagnose in primary care. While usually more expensive they improve diagnostic accuracy enabling better use of antibiotics and potentially lead to better outcomes for patients. In order to introduce such technologies, old diagnostic tests need to be discontinued and consideration given to
rationalising current testing if no additional resources are available. Provision, electronically of enhanced clinical information on reason for testing would better enable diagnostic laboratories to guide testing practices of clinicians and would likely facilitate introduction of new diagnostics by potentially making their introduction cost neutral. The inclusion of specific information electronically on reason for testing, which can be used to inform decision making, is not currently available for STI testing in Bristol.

**BNSSG innovations and Interventions**

1) Redesigned website as a single point access for all Unity sexual all services in BNSSG. ([https://www.unitysexualhealth.co.uk/](https://www.unitysexualhealth.co.uk/)) This promotes self-management through the use of HIV/STI self-testing kits and on-line information, including videos, containing complex but frequently required information on contraception for example: ([https://www.unitysexualhealth.co.uk/contraception/emergency-contraception/](https://www.unitysexualhealth.co.uk/contraception/emergency-contraception/)). Further videos are due to be added e.g. combined oral contraceptive pill.

2) Online STI postal testing delivered in collaboration with Public Health England South West Laboratories in order to provide a high-quality service while containing costs. Chlamydia, gonorrhoea, HIV and syphilis testing is available to all persons 16yrs and over through the Unity website. ([https://www.unitysexualhealth.co.uk/](https://www.unitysexualhealth.co.uk/))

3) Introduction of a rapid sexual health service using NAATs in Bristol. The Hologic Panther has just been installed at the main Unity Sexual Health Clinic which can provide a chlamydia, gonorrhoea, *Mycoplasma genitalium* and trichomonas NAAT results from a patient self-test in 4 hours. Women will also provide a self-test for microscopy to diagnose bacterial vaginosis and candidiasis. Patients with symptoms would be asked to self-test and re-attend to see a clinician in 4 hours, who would have access to the chlamydia, gonorrhoea, NAAT result, targeted *Mycoplasma genitalium* and trichomonas NAAT test results and vaginal microscopy results. Blood testing for Syphilis and HIV is also taken on arrival with the result available in 1 week unless a point of care HIV test is performed. This is the first such service model for sexual health care delivery in the world. The following benefits are anticipated:

- Improvement in the quality of care provided with fewer invasive examinations (up to 66% reduction speculum examination in women and 33% reduction in urethral smears in men) in symptomatic patient and reduced number of follow-up visits.
- Delivery of infection specific treatment with reduction in unnecessary use of antimicrobials.
• Increased uptake of screening by high risk groups a PHE priority
• Improved partner notification
• Continued ability to continue deliver high quality sexual health advice and care to those most in need.
• Enhanced staff satisfaction

4) Improved patient care pathway management through introduction of on-line registration to our electronic patient record system which will also enable patients to provide basic clinical information prior to a consultation and be directed to relevant information on the Unity website. This is a planned innovation which is anticipated to greatly enhance the way we provide the rapid STI service.

5) Development of an integrated enhanced intelligence surveillance system. Geo/maps of chlamydia positivity coverage and “prevalence” have been produced and are currently being used to identify good and poorly performing areas of chlamydia screening in Bristol to characterise best practice, which will then be introduced throughout BNSSG. Unity is also using historical NCSP data which contains reason for testing to inform the prevalence model developed at Imperial College (9). Unity with its collaborators is developing the methodology to collect electronically routine data on reason for chlamydia testing on all patients and use this to develop chlamydia prevalence geo-maps at MSOA by gender and age for routine use. These have the potential to inform NCSP targeting to increase detection while containing costs. Unity is also working with PHE Field Epidemiology and Network for the South West to explore integrating this data with other sexual health outputs at the MSOA level to inform and evaluate new multi-agency way of improving population sexual health. This would include using this information to inform delivery of local RSE teaching programmes.

6) System wide partner notification (PN) service to support primary care. This is planned to be introduced after the rapid STI service has been successfully established and will be administered through the local NCSP team located within Unity. It is intended staff time released because of the new STI service will be used to support this service.

7) Improved provision of new NAAT diagnostics in primary care. An additional benefit of introducing the electronic collection of reason for testing when ordering STI testing (see 5) is that these could inform testing algorithms to ensure that tests are used appropriately, and cost effectiveness concerns can also be taken into consideration. Unity and PHE intend to explore how the routine analysis of such data can inform diagnostic testing strategies and facilitate the introduction of new NAAT tests.

Development, delivery and evaluation
1. UHBT has and continues to work closely with PHE South West Microbiology and Field Epidemiology services, University of Bristol, Bristol Health Partner Sexual Health Improvement Programme (SHIP) [http://www.bristolhealthpartners.org.uk/health-integration-teams/sexual-health-improvement-hit/], NIHR CLAHRC West [https://clahrc-west.nihr.ac.uk/] and NIHR HPRUs in Evaluation of Interventions [http://www.hpruei.nihr.ac.uk/] and Modelling Methodology [http://www.imperial.ac.uk/hpru-modelling/] to develop, implement and evaluate these interventions.

2. University of Bristol has developed a costing tool Healthcare Optimisation Planner which uses a TDABC modelling approach, to support the business case to introduce the Hologic Panther to the Unity Sexual Health Clinic.[6] Data from EPRs with review of the literature supported by expert opinion was used to inform the care pathways models before after the introduction of rapid STI testing service with the Hologic Panther. This was able to facilitate communication between clinicians, microbiologists and management about the potential clinical benefits and associated costs of the new service and how this would affect future staffing needs, when developing the tender proposal and business case.

References


