Acceptability of remote prescribing and postal delivery services for contraceptive pills and treatment of uncomplicated *Chlamydia trachomatis*

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► Additional material is published online only. To view please visit the journal online (http://dx.doi.org/10.1136/bmjsrh-2020-200687).

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Received 28 April 2020
Revised 23 September 2020
Accepted 29 October 2020

To cite: Nadarzynski T, Symonds Y, Carroll R, *et al*. *BMJ Sex Reprod Health* Published Online First: [please include Day Month Year]. doi:10.1136/bmjsrh-2020-200687

ABSTRACT

Objectives The digitalisation of sexual and reproductive health (SRH) services offers valuable opportunities to deliver contraceptive pills and chlamydia treatment by post. We aimed to examine the acceptability of remote prescribing and 'medication-by-post' in SRH.

Study design An online survey assessing attitudes towards remote management was distributed in three UK SRH clinics and via an integrated sexually transmitted infection (STI) postal self-sampling service. Logistic regressions were performed to identify potential correlates.

Results There were 1281 participants (74% female and 49% <25 years old). Some 8% of participants reported having received medication via post and 83% were willing to receive chlamydia treatment and contraceptive pills by post. Lower acceptability was observed among participants who were: >45 years old (OR 0.43 (95% CI 0.23–0.81)), screened for STIs less than once annually (OR 0.63 (0.42–0.93)), concerned about confidentiality (OR 0.21 (0.90–0.50)), concerned about absence during delivery (OR 0.09 (0.02–0.32)) or unwilling to provide blood pressure readings (OR 0.22 (0.04–0.97)). Higher acceptability was observed among participants who reported: previously receiving medication by post (OR 4.63 (1.44–14.8)), preference for home delivery over clinic collection (OR 24.1 (11.1–51.9)), preference for home STI testing (OR 10.3 (6.16–17.4)), ability to communicate with health advisors (OR 4.01 (1.03–15.6)) and willingness to: register their real name (OR 3.09 (1.43–10.6)), complete online health questionnaires (OR 3.09 (1.43–10.6)) and use generic contraceptive pills (OR 2.88 (1.21–6.83)).

Conclusions Postal treatment and entering information online to allow remote prescribing were acceptable methods for SRH services and should be considered alongside medication collection in pharmacies. These methods could be particularly useful for patients facing barriers in accessing SRH. The cost-effectiveness and implementation of these novel methods of service delivery should be further investigated.

Key messages

- The majority (83%) of sexual health service users would be willing to receive contraceptive pills and chlamydia treatment via post, while one in five would prefer to receive medication directly from the doctor.
- Remote prescribing, postal delivery (medication-by-post) and click-and-collect services are highly acceptable in sexual and reproductive health.
- Those aged over 45 years, first time or infrequent service attenders, and those who do not use online health services and are concerned about their confidentiality were less likely to accept remote prescribing.

INTRODUCTION

Every day, about 1 million people acquire a sexually transmitted infection (STI), worldwide.[1] In England, around 450 000 new STIs are diagnosed every year and individuals aged 16–24 years old account for 50% of new diagnoses.[2] The estimated costs of STI treatments equate to £620 million per year.[3] Gay, bisexual and other men who have sex with men

(MSM), as well as Black Asian and minority ethnic (BAME) individuals, are the most affected.[2]

Chlamydia trachomatis is the most common bacterial STI in North America and Europe.[4] If left untreated, chlamydia can cause pelvic inflammatory disease, tubal infertility and ectopic pregnancy in women, as well as epididymal-orchitis in men and, less frequently, sexually acquired reactive arthritis in both genders.[5] The UK introduced the National Chlamydia Screening Programme (NCSP) in 2003 to improve detection, decrease transmission rates and reduce the associated morbidities.[6] There has been a significant shift towards providing online sexual and reproductive health services (SRHS), including the utilisation of self-sampling/self-testing kits, which is particularly pertinent to 15–24-year-old women in whom chlamydia is most prevalent.[7] As STIs continue to be a major public health concern, policymakers emphasise the need for optimal and cost-effective methods for increasing screening and treatment uptake.[8] Young women are also at an increased risk of unplanned pregnancies, thus the provision of contraception services is a cost-effective public health intervention. In the UK, 45% of pregnancies were unplanned in women aged 16–19 years.[9] As a significant proportion of women face barriers to healthcare access, individual, social and service delivery considerations need to be addressed to reduce these barriers and increase the cost-effectiveness and efficiency of SRHS.

Digitalisation offers solutions to service delivery aiding standard care. It has been driven by the need to manage demand in an increasing austere financial environment, to increase access, equity and reduce the burden on overstretched face-to-face services in what is hoped to be a cost-effective manner. Research has demonstrated that women benefit from digital sex education and counselling around contraceptive choices and STI screening.[10 11] Online services are feasible, safe and effective in the management of patients with chlamydia and other STIs.[12] The proportion of chlamydia tests that are provided via online postal self-sampling services has rapidly increased, with 17% of all chlamydia tests in 15–24-year-olds in 2018 being accessed online in the UK.[2] This has also been accelerated during the COVID-19 pandemic, where services had to rapidly switch to online delivery. Users express positive attitudes to online services that are convenient, fast, secure and linked with pharmacies or helplines.[13] Pathway frameworks offer a comprehensive structure of e-health services in sexual and reproductive medicine as a powerful tool in public health and clinical management.[14] Standardised digital history-taking tools, which can be used in both face-to-face and remote clinical settings, have the potential to improve the quality of drug prescription and patient safety if users are willing to provide the necessary clinical information.

Solent SRHS have provided online postal self-sampling to the Hampshire (UK) community since 2015. The service considered remote consultations and provision of contraception and chlamydia treatment via postal delivery. Before introducing these services, the acceptability of remote management in the population needs to be established to identify barriers to effective implementation. We aimed to assess the acceptability and preferences for remote prescribing and delivery of chlamydia treatment and contraception by post.

METHODS

Design

This was an exploratory, cross-sectional survey focusing on service users' willingness to input clinical information online and receive chlamydia treatment and contraceptive pills delivered by post. The survey was approved as a service evaluation and development by Solent NHS Trust Clinical Governance (Ref. SE-271).

Participants and data collection

Between May and August 2018, we conducted a cross-sectional survey exploring potential 'mediation-by-post' services for Solent NHS Trust SRHS. We recruited participants above the age of 16 years accessing services within Hampshire, UK. The survey was designed after consultations with service users about the development of online services. Views were gathered to formulate this questionnaire available in both pencil-and-paper and digital formats. Eight hundred paper surveys were distributed in three sexual health clinics. Service users were encouraged to complete the anonymous questionnaire while registering for their clinical appointment, with completion indicating their consent. Completed surveys were returned to the reception in an envelope and placed in a secure location. An additional 600 surveys were sent to those who requested for an online STI self-sampling kit via the SRHS website (www.letstalkabout.nhs.uk). Individuals were then asked to return the completed survey in an envelope to the laboratory which processed the samples. Also, a web link to an online survey was advertised on the SRHS website and Twitter for additional responses. We were unable to calculate the overall response rate as there was no record of how many questionnaires were accessed online; nevertheless, 866 paper surveys were completed.

Measurement

The survey consisted of 32 questions (see online supplemental appendix 1), including demographic variables such as age, gender identity, ethnicity, sexual orientation, education, whether participants were registered with a general practitioner (GP), and any past STI diagnoses. Participants were asked about their preferred method for, and frequency of, STI screening and whether they had previously collected any

medication via post or at a pharmacy with the options 'Delivered at home', 'Given by a doctor' or 'Collected at my pharmacy'.

Two outcome variables measured the acceptability of postal treatment services: (i) the willingness to receive chlamydia treatment (antibiotics) by post and (ii) the willingness to receive contraceptive pills by post, both with options 'Yes', 'No' and 'Not sure' (Question: "Would you be willing to receive medication (antibiotic) to treat chlamydia by post?"). Other questions assessed the most preferred methods for receiving medication and the concerns about confidentiality in receiving them by post. The acceptability of remote prescribing was assessed by asking about willingness: to be contacted by a health advisor, to completing an online questionnaire, to disclosing pre-existing medical conditions, to providing a blood pressure reading, to accepting generic (non-branded) medication and to registering their real name and contact details before the order was finalised. Specific preferences for a tracked delivery of the medication, a mobile telephone text message with the status of the order and the need to discuss the side effects and dosage with a pharmacist were assessed to inform the development of the service. Also, an expected arrival delivery time and the time to contact the clinic in case of misplaced delivery were assessed. The questions relating to the contraceptive pill were only directed to women.

Patient and public involvement

Patients were not directly involved in the design, recruitment and the conduct of the survey. Posters were disseminated in the waiting areas outlining the results of the study.

Data analysis

The variables were either categorical or ordinal. Descriptive statistics were performed to identify the percentage of responses using IBM SPSS software version 24. All variables were then dichotomised (ie, 'Yes' and 'No/not sure'; see table 1). Twenty-one simple logistic regressions with a single categorical predictor were performed to identify potential correlates of acceptability of the two outcome variables and calculate odds ratios (ORs) and 95% confidence intervals (95% CIs) to determine their magnitude. No modelling was used to perform regressions due to the explorative nature of the analysis.

RESULTS

In total, 1281 service users completed the survey, with about half (49%) under the age of 25 years (table 2). The majority (74%) identified as female, White (91%), heterosexual or straight (86%), and having a college or university education (78%). Almost all (95%) were registered with GP services and 40% reported being diagnosed with an STI in the past. While half of the sample reported STI screening once per year or more often, for 20% of participants the survey testing was the first time they had been screened. Nearly half (48%) stated that remote STI self-sampling, using an online testing kit, was their preferred method of STI screening.

While the majority (87%) had collected medication at a pharmacy, only 8% reported ever receiving medication by post. In general, most participants preferred to either be given the medication by a doctor (20%) or collect it at a pharmacy (34%). However, in terms of receiving chlamydia treatment and contraceptive pills, many (45%) chose home delivery as their preferred method. When asked directly, around 83% of participants were willing to receive antibiotics and contraceptive pills by post.

The assessment of preferences for remote prescribing showed that most participants reported their willingness to complete an online questionnaire (78%), register their real name and contact details (85%), disclose pre-existing conditions (89%) and speak to a health advisor on the telephone (85%) before the finalisation of the medication order. Only 27% reported a preference for a consultation about dosage and side effects with a pharmacist. Regarding contraception for women, 81% would be willing to provide blood pressure readings and 67% would accept receiving a generic version of the contraceptive pill.

The assessment of preferences for the 'medication by post' method showed that most participants (76%) were not concerned about confidentiality, but 44% would be concerned about the medication delivery if they were away from home. Only 35% endorsed a preference for signed tracked delivery of medication. The majority (83%) would prefer to receive a mobile telephone update about their delivery and most participants (86%) thought that delivery within three working days was appropriate, although a substantial proportion indicated 'next day delivery' as their preferred option for chlamydia treatment (43%) and contraception (37%). While 48% of the sample would wait 2–3 days to contact the clinic if the medication was not delivered, about 36% would wait only 1 day. Sexual health clinics were perceived as the preferred source of advice on the medication by post.

The highest willingness (99%) to use remote services for chlamydia treatment was observed among participants who showed strong preferences for 'home delivery methods' of medication; the lowest willingness (41%) was reported by the participants who would not register their real name for the medication order. Lower acceptability of chlamydia treatment by post was observed among participants who were: above the age of 45 years, screened for STIs less than once a year, concerned about their confidentiality, concerned about the delivery during their absence, and those not willing to provide their blood pressure readings. Higher acceptability was observed among participants who had received medication by post in the past,

Table 1 Correlates of the willingness to receive medication by post

Variable	Those 'willing' to receive chlamydia treatment by post %, OR (95% CI)	Those 'willing' to receive contraceptive pills by post %, OR (95% CI)
Age (years)		
<45	88.0%, 1.00 (ref)	84.9%, 1.00 (ref)
45+	76.3%, 0.43 (0.23–0.81)*	56.8%, 0.19 (0.09–0.41)*
Gender		
Male	81.1%, 1.00 (ref)	
Female	88.8%, 1.48 (0.96–2.29)	0
Ethnicity		
White	87.2%, 1.00 (ref)	83.7%, 1.00 (ref)
Ethnic minority (non-White)	84.1%, 0.78 (0.41–1.49)	78.6%, 0.87 (0.42–1.80)
Sexual orientation		
Heterosexual	87.3%, 1.00 (ref)	83.9%, 1.00 (ref)
Sexual minority	88.1%, 1.09 (0.60–2.00)	78.2%, 0.77 (0.38–1.58)
Education		
High school or below	89.1%, 1.00 (ref)	83.9%, 1.26 (0.75–2.10)
College and university degree	86.6%, 0.73 (0.42–1.26)	84.0%, 1.00 (ref)
Registered with a GP		
Yes	87.2%, 1.00 (ref)	83.3%, 1.00 (ref)
No	77.4%, 0.53 (0.19–1.48)	69.6%, 0.57 (0.15–2.06)
Past STI infection		
Yes	88.4%, 1.00 (ref)	85.9%, 1.40 (0.93–2.11)
No	86.1%, 0.75 (0.50–1.13)	82.5%, 1.00 (ref)
Ever collected medication at the pharmacy		
Yes	87.6%, 1.37 (0.84–2.22)	84.3%, 2.04 (1.20–3.47)*
No	83.7%, 1.00 (ref)	75.8%, 1.00 (ref)
Ever received medication via post		
Yes	96.7%, 4.63 (1.44–14.8)*	85.3%, 1.56 (0.66–3.73)
No	86.2%, 1.00 (ref)	83.0%, 1.00 (ref)
Frequency of STI screening		
First time or less than once a year	83.1%, 0.63 (0.42–0.93)*	80.7%, 0.77 (0.51–1.16)
Once a year or more often	91.0%, 1.00 (ref)	86.3%, 1.00 (ref)
Preferred method of STI screening		
Online (home) testing	97.1%, 10.3 (6.16–17.4)*	88.1%, 1.63 (1.05–2.55)*
In-clinic (GP or sexual health)	76.7%, 1.00 (ref)	78.6%, 1.00 (ref)
Preference for receiving medication (general)		
Delivered to home	98.8%, 24.1 (11.1–51.9)*	89.8%, 2.30 (1.44–2.55)
Collected from a pharmacy or a doctor	76.7%, 1.00 (ref)	77.7%, 1.00 (ref)
Concerned about confidentiality		
Yes	60.6%, 0.21 (0.90–0.50)*	67.8%, 0.61 (0.25–1.44)
No	94.6%, 1.00 (ref)	88.4%, 1.00 (ref)
Concerned about delivery if absent at home		
Yes	75.2%, 0.09 (0.02–0.32)*	78.3%, 0.83 (0.36–1.89)
No	95.6%, 1.00 (ref)	87.3%, 1.00 (ref)
Willingness to speak with health advisor via telephone prior to finalise medication order		

Continued

Table 1 Continued

Variable	Those 'willing' to receive chlamydia treatment by post %, OR (95% CI)	Those 'willing' to receive contraceptive pills by post %, OR (95% CI)
Yes	91.9%, 4.01 (1.03–15.6)*	85.5%, 1.68 (0.49–5.74)
No	54.5%, 1.00 (ref)	60.6%, 1.00 (ref)
Willingness to disclose pre-existing conditions		
Yes	91.0%, 2.87 (0.79–10.4)	85.9%, 1.00 (ref)
No	51.4%, 1.00 (ref)	55.3%, 0.35 (0.13–2.05)
Willingness to register a real name for the order		
Yes	91.9%, 5.65 (1.76–18.1)*	87.7%, 2.00 (0.58–6.86)
No	41.2%, 1.00 (ref)	47.1%, 1.00 (ref)
Willingness to fill in an online questionnaire about health prior to order		
Yes	94.5%, 3.09 (1.43–10.6)*	88.8%, 3.67 (1.45–9.27)*
No	54.1%, 1.00 (ref)	60.9%, 1.00 (ref)
Willingness to provide blood pressure reading		
Yes	89.7%, 1.00 (ref)	82.2%, 2.08 (0.83–5.22)
No	80.1%, 0.20 (0.04–0.97)*	56.2%, 1.00 (ref)
Willingness to receive generic (non-branded) medication		
Yes	93.9%, 2.88 (1.21–6.83)*	97.5%, 35.8 (15.8–81.3)*
No	71.9%, 1.00 (ref)	44.1%, 1.00 (ref)
Preference for a consultation with a pharmacist to discuss side effects and dosage		
Yes	78.2%, 0.52 (0.23–1.16)	75.0%, 0.34 (0.16–0.73)*
No	90.3%, 1.00 (ref)	86.1%, 1.00 (ref)

*p<0.05.
GP, general practitioner; ref, reference; STI, sexually transmitted infection.

preferred the home delivery method for medication, preferred online/home testing for STIs, were willing to speak with a health advisor, register their real name, complete online health questionnaires, and use generic medication.

The highest willingness (97%) to use remote services for contraceptive pills was observed among women who were willing to use generic, non-branded versions of the medication and the lowest willingness (47%) was seen among the participants who would prefer not to register their real name for the medication order. Lower acceptability of receiving contraceptive pills by post was observed among participants who were: above the age of 45 years and those who expressed a preference for a consultation with a pharmacist to discuss side effects and dosage. Higher acceptability was reported by women who had collected medication at a pharmacy in the past and who were willing to complete an online questionnaire about their health before ordering medication.

DISCUSSION

To our knowledge, this is the first study exploring the acceptability and user preferences for remote prescribing and postal treatment for chlamydia treatment and contraception provision. The findings indicate that most participants would agree to provide the necessary information for remote prescribing such as real name, medical and drug/allergy history and blood pressure readings.[15 16] Although approximately only 1 in 12 participants had previously received medication in the post, the majority reported 'medication by post' or 'click and collect' as their preferred delivery methods. This suggests that a significant proportion of service users would be receptive to remote antibiotic treatment and contraception services, as the preferences overlap with acceptability, indicating a willingness to receive medication away from the clinic. Most participants were willing to receive generic drugs and would expect delivery within three working days or, in the case of chlamydia treatment, next day delivery. Sexual health clinics were the preferred source of information about 'medication by post'.

Previous studies have demonstrated the value of assessing acceptability and motivations for digital services. One study indicated mixed attitudes towards remote prescribing services among health professionals, with perceived usefulness, ease of use and perceived risk of error in prescribing associated with acceptability.[17] A small study of medication by post in Malaysia showed that service users were unaware of this method of delivery and only a half showed interest

Table 2 Sample characteristics and preferences for e-prescribing (n=1281)

Variable	Total (n (%))	Variable	Total (n (%))
Demographic variables		**Preferences for remote prescribing and postal treatment**	
Age (years)		Willingness to receive antibiotic by post	
<18	41 (3)	Yes	1042 (82)
18–24	555 (46)	No/not sure	230 (18)
25–34	410 (34)	Willingness to receive contraceptive pills by post	
35–44	122 (10)	Yes	797 (83)
45–54	56 (7)	No/not sure	160 (17)
55–64	22 (2)	Willingness to provide blood pressure reading	
>65	7 (<1)	Yes	772 (81)
Gender		No/not sure	185 (19)
Male	325 (26)	Willingness to receive generic contraceptive pills	
Female	932 (74)	Yes	640 (67)
Non-binary	3 (<1)	No/not sure	313 (33)
Other	5 (<1)	Concerned about confidentiality using postal delivery	
Ethnicity		Yes	312 (24)
White	1163 (91)	No/not sure	960 (76)
Black African	22 (2)	Concerned about delivery if absent at home	
Black Caribbean	11 (1)	Yes	554 (44)
Asian	21 (2)	No/not sure	715 (56)
Mixed-race	47 (4)	Willingness to speak with health advisor via telephone prior to finalise medication order	
Other	10 (<1)	Yes	1078 (85)
Sexual orientation		No/not sure	194 (15)
Heterosexual or straight	1091 (86)	Willingness to disclose pre-existing conditions	
Gay or lesbian	78 (6)	Yes	1053 (89)
Bisexual	83 (7)	No/not sure	126 (11)
Prefer not to say and other	17 (1)	Willingness to register a real name for the order	
Education		Yes	1075 (85)
No formal education	91 (7)	No/not sure	191 (15)
Primary school	8 (<1)	Willingness to fill in an online questionnaire about health prior to medication order	
High school	144 (12)	Yes	987 (78)
Collage	508 (41)	No/not sure	280 (22)
University degree	473 (38)	Preference for signed tracked delivery	
Other	24 (2)	Yes	443 (35)
Registered with GP		No/not sure	821 (65)
Yes	1208 (95)	Preference for a consultation with a pharmacist to discuss side effects and dosage	
No/not sure	66 (5)	Yes	345 (27)
Past STI diagnosis		No/not sure	918 (73)
Yes	504 (40)	Preference for mobile telephone updates about the delivery status	
No	729 (57)	Yes	1050 (83)
Not sure	42 (3)	No/not sure	212 (17)
Frequency of STI screening		Preferred waiting time for antibiotic to be delivered	
First time	249 (20)	Next day delivery	522 (43)
Once every few years	379 (30)	Within 3 working days	524 (43)
Once a year	266 (22)	Within 5 working days	148 (12)
Several times a year	354 (28)	Within 7 working days	25 (2)

Continued

Table 2 Continued

Variable	Total (n (%))	Variable	Total (n (%))
Preferred method of STI screening		Preferred waiting time for contraceptive pills to be delivered	
Online (home) testing	611 (48)	Next day delivery	337 (37)
At a sexual health clinic	552 (44)	Within 3 working days	418 (46)
At GP surgery	83 (7)	Within 5 working days	103 (12)
Other	15 (1)	Within 7 working days	41 (5)
Variables related to medication delivery		Optimal waiting time to contact the clinic in case the delivery is misplaced	
Ever collected medication at the pharmacy		1 day	451 (36)
Yes	1104 (87)	2–3 days	603 (48)
No/not sure	171 (13)	4–7 days	168 (14)
Ever received medication via post		Over a week	32 (2)
Yes	97 (8)	Preferred source of advice on the medication delivered by post	
No/not sure	1179 (92)	GP	387 (31)
Preference for receiving medication (general)		Sexual health clinic	711 (57)
Delivered to home	568 (45)	Pharmacy	126 (10)
Given by a doctor	260 (20)	Other	29 (2)
Collected at pharmacy	427 (34)		
Other	15 (1)		
Preference for receiving chlamydia treatment			
Delivered to home	721 (57)		
Given by a doctor at the clinic	261 (21)		
Collected at pharmacy	273 (22)		
Other	9 (<1)		
Preference for receiving contraceptive pills			
Delivered to home	536 (60)		
Given by a doctor at the clinic	92 (10)		
Collected at pharmacy	250 (28)		
Other	20 (2)		

GP, general practitioner; STI, sexually transmitted infection.

in the service, with the majority reporting concerns with a potential missed delivery.[18] In the present study, about 20% of participants were not willing to provide via an online questionnaire the information necessary to allow safe prescribing. Hence, users' concerns should be explored in more detail in subsequent research to identify common barriers and design user-centred digital services for all patients and identify those who find digital services less suitable. Although telemedicine offers valuable opportunities, there is a risk of widening health inequalities due to access to digital technologies.[19] Thus, service users who are not capable or unwilling to use e-prescribing due to digital literacy, access to technology or personal preferences should have access to alternative pathways of care.

This study achieved a large sample size and provides novel knowledge about online services. However, there are several limitations as it was exploratory and not designed to test prespecified hypotheses. The participants were recruited within one NHS Trust in Hampshire and their responses may not be representative of service users in other regions, especially in big cities, and individuals that are 'seldom heard' or hard-to-engage. Due to various sources of recruitment, we were uncertain about the refusal rate and how that affected the representativeness of the sample. Also, the survey was conducted before the coronavirus outbreak and patients' views on remote prescribing and postal treatment might be different if assessed now. The novel coronavirus SARS-CoV-2 (COVID-19) outbreak

in 2020 transferred the majority of SRHS either to telephone or online assessments, as face-to-face healthcare was dramatically reduced, due to social distancing measures and staff illness or redeployment. Remote management using telephone assessments and online services has allowed service provision to continue, including diagnosis and management of sexual health conditions with remote prescribing and postal treatment or 'click-and-collect'. These developments mean that the current findings are of particular importance as they provide insight into individuals' preferences before service changes are implemented and they will inform future service development as we transition from lockdown to a post-COVID-19 time.

In conclusion, as a majority of service users in this study were receptive to these methods of delivery, remote prescribing and postal delivery of treatment for uncomplicated chlamydia and contraception should be considered as part of SRHS. Nevertheless, such a service needs to be closely monitored to identify any potential missed delivery, medication non-adherence, or misuse. Further research needs to explore health professionals' and service users' concerns as well as individual barriers in order to design the most acceptable, effective and equitable digital SRH services supporting patients with their treatment and prophylaxis.

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Contributors TN, YS and RC designed the study. All coauthors contributed to the analyses and the interpretation of findings as well as the drafting of the manuscript, and approved the final version of the manuscript.

Funding The authors have not declared a specific grant for this research from any funding agency in the public, commercial or not-for-profit sectors.

Competing interests None declared.

Patient and public involvement Patients and/or the public were not involved in the design, or conduct, or reporting, or dissemination plans of this research.

Patient consent for publication Not required.

Ethics approval Solent NHS Trust Service Research and Improvement.

Provenance and peer review Not commissioned; externally peer reviewed.

Data availability statement Data are available upon reasonable request. No additional data.

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REFERENCES

1 World Health Organization. Global health sector strategy on sexually transmitted infections 2016–2021, 2016. Available: http://www.who.int/
2 Public Health England. Sexually transmitted infections and screening for chlamydia in England, 2018. *Health Protection Report* 2019;13:19.
3 Development Economics. Unprotected nation: the financial and economic impacts of restricted contraceptive and sexual health services. London: Society of Sexual Health Advisors, 2013. Available: http://ssha.info/wp-content/uploads/Unprotected-Nation.pdf
4 Bébéar C, de Barbeyrac B. Genital Chlamydia trachomatis infections. *Clin Microbiol Infect* 2009;15:4–10.
5 Cates W, Wasserheit JN. Genital chlamydial infections: epidemiology and reproductive sequelae. *Am J Obstet Gynecol* 1991;164:1771–81.
6 LaMontagne DS, Fenton KA, Randall S, *et al*. Establishing the National Chlamydia Screening Programme in England: results from the first full year of screening. *Sex Transm Infect* 2004;80:335–41.
7 Gkatzidou V, Hone K, Sutcliffe L, *et al*. User interface design for mobile-based sexual health interventions for young people: design recommendations from a qualitative study on an online Chlamydia clinical care pathway. *BMC Med Inform Decis Mak* 2015;15:72.
8 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. *BMJ* 2011;342:c7250.
9 Wellings K, Jones KG, Mercer CH, *et al*. The prevalence of unplanned pregnancy and associated factors in Britain: findings from the Third National Survey of Sexual Attitudes and Lifestyles (Natsal-3). *Lancet* 2013;382:1807–16.
10 Guse K, Levine D, Martins S, *et al*. Interventions using new digital media to improve adolescent sexual health: a systematic review. *J Adolesc Health* 2012;51:535–43.
11 Salam RA, Faqqah A, Sajjad N, *et al*. Improving adolescent sexual and reproductive health: a systematic review of potential interventions. *J Adolesc Health* 2016;59:S11–28.
12 Estcourt CS, Gibbs J, Sutcliffe LJ, *et al*. The eSexual Health Clinic system for management, prevention, and control of sexually transmitted infections: exploratory studies in people testing for Chlamydia trachomatis. *Lancet Public Health* 2017;2:e182–90.
13 Aicken CRH, Sutcliffe LJ, Gibbs J, *et al*. Using the eSexual Health Clinic to access chlamydia treatment and care via the internet: a qualitative interview study. *Sex Transm Infect* 2018;94:241–7.
14 Gibbs J, Sutcliffe LJ, Gkatzidou V, *et al*. The eClinical care pathway framework: a novel structure for creation of online complex clinical care pathways and its application in the management of sexually transmitted infections. *BMC Med Inform Decis Mak* 2016;16:98.
15 General Medical Council. Remote prescribing via telephone, fax, video-link or online, 2012. Available: https://www.gmc-uk.org/ethical-guidance/ethical-guidance-for-doctors/prescribing-and-managing-medicines-and-devices/remote-prescribing-via-telephone-video-link-or-online
16 Royal Pharmaceutical Society. Practical guide for independent prescribers, 2020. Available: https://www.rpharms.com/resources/ultimate-guides-and-hubs/independent-prescribers
17 Omar A, Ellenius J, Lindemalm S. Evaluation of electronic prescribing decision support system at a tertiary care pediatric hospital: the user acceptance perspective. Information Technology and Communications in Health Conference Proceedings, 2017:256–61.
18 Lim B, Khan AR, Abidin NA, *et al*. Can 'Medication by Post' improve medication compliance? *Australas Med J* 2011;4:460.
19 Bol N, Helberger N, Weert JCM. Differences in mobile health app use: a source of new digital inequalities? *The Information Society* 2018;34:183–93.

Would you like to receive your medication by post?

Some of our NHS services are currently undergoing a change. We aim to help our patients to have a better access to our services using new online services such as the www.letstalkaboutit.nhs.uk website.

About Medication by Post

We are currently exploring methods in which we could deliver our medications such as chlamydia treatment or contraceptive pills (for women) by post. Such a method would allow some of our patents to receive medication without the need to visit the clinic. This survey aims to explore if 'medication-by-post' is an acceptable method for our patients and we would like to design the most suitable service that can meet your needs.

We will be asking you some questions about yourself, your sexual health, and your views on potential 'medication-by-post' services. Everything is anonymous and will be treated in the strictest confidence. The data we collect will help us decide how we might be able to improve our sexual health services.

This survey is voluntary and you can stop at any time without giving a reason.
This survey is for service development purposes only. Please return your responses to the reception or send them with your STI test kit. The completion of the survey will indicate that you agree for the answers to be analysed and published.

For more information about this survey, please contact Dr Tom Nadarzynski (t.nadarzynski@soton.ac.uk)

Please tell us about yourself, all information is confidential.

Answer each question by circling an answer

1. Age	<18	18-24	25-34	35-44	45-54	55-64	Over 65
2. How do you identify yourself?				Male	Female	Non-binary	Other
3. Ethnicity		White	Black African	Black Caribbean	Asian	Mixed race	Other
4. Sexual orientation			Straight	Gay or Lesbian	Bisexual	Prefer not say	Other
5. Education		No formal education	Primary school	High school	College	University degree	

6. Are you registered with a GP?	Yes	No	Not sure
7. Have you ever been diagnosed with a sexually transmitted infection?	Yes	No	Not sure
8. Have you ever collected any medication at pharmacy?	Yes	No	Not sure
9. Have you ever received any medication via post?	Yes	No	Not sure

10. How often do you test for sexually transmitted infections?	It is my first time	Once every few years	Once a year	Several times a year
11. What is your most preferred way to test for sexually transmitted infection?	Using online testing kit	Visiting sexual health clinic	Visiting my GP	Other: .....
12. What is your most preferred way to receive your medication?	Delivered to home	Given by a doctor at the clinic	Collected at my pharmacy	Other: .....
13. If you were diagnosed with chlamydia, where would you prefer to collect your medication?	Delivered to home	Given by a doctor at the clinic	Collected at my pharmacy	Other: .....

14. Would you be willing to receive medication (antibiotic) to treat chlamydia by post?	Yes	No	Not sure
15. Are you concerned about your confidentiality of receiving medication by post?	Yes	No	Not sure
16. Would you be concerned about the delivery of your medication if you were not at home?	Yes	No	Not sure
17. Would you be willing to be contacted by a health advisor via phone to finalise your medication order?	Yes	No	Not sure
18. Would you be willing to disclose any pre-existing medical conditions, allergies and medications?	Yes	No	Not sure

19. Would you be willing to register your name and contact details in order to receive your medication?	Yes	No	Not sure
20. Would you be willing to fill in a medical questionnaire online to receive medication by post?	Yes	No	Not sure
21. Would you require a track delivery that needs to be signed-for by you?	Yes	No	Not sure
22. If you receive your medication by post, would you still feel the need to discuss the dosage and side-effects with a pharmacist?	Yes	No	Not sure
23. Would you like to receive mobile phone text updates about the status of your delivery order?	Yes	No	Not sure

24. How long would you expect this medication (antibiotic) to arrive?	Next day delivery	Within 3 working days	Within 5 working days	Within 7 working days
25. If your medication (antibiotic) did not turn up to your address, how long would you wait before you contact the clinic?	1 day	2-3 days	4-7 days	Over a week
26. If you had questions about your medication, who would you prefer to contact for advice?	My GP	Sexual health clinic	Pharmacy	Other: .....

– <u>For Women Only</u> –

27. Would you be willing to receive medication (contraceptive pills) by post?	Yes	No	Not sure
28. Would you be willing to provide your blood pressure reading before you order your medication?	Yes	No	Not sure
29. Would you be willing to receive the generic (non-branded) version of the contraceptive pills by post?	Yes	No	Not sure

30. How quickly would you need your contraceptive pills?	Next day delivery	Within 3 working days	Within 5 working days	Within 7 working days
31. If your contraceptive pills did not turn up to your address, how long would you wait before you contact the clinic?	1 day	2-3 days	4-7 days	Over a week
32. If you were to receive your contraceptive pills, where would you prefer to collect them?	Delivered to home	Given by a doctor at the clinic	Collected at my pharmacy	Other: .....

<u>Once completed, please return the survey in the envelope to either the reception of the sexual health clinic or with your online test.</u>