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Prevalence of STIs and people's satisfaction in a general population STI testing site in Bern, Switzerland

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ABSTRACT

Objectives Access to affordable STI testing for asymptomatic persons is important to reduce STI transmission. Our testing site offers easily accessible and affordable STI testing for the general population irrespective of symptoms. Here we report STI prevalence and motivational factors of attendance.

Methods Between 2017 and 2019, all participants at our STI testing site at the University Hospital Bern, Switzerland, were interviewed with a computer-based self-completion questionnaire. Pooled (oral, genital and anal) swabs were tested for *Chlamydia trachomatis*, *Neisseria gonorrhoeae* and blood samples for syphilis and HIV. People's motivational factors to attend were assessed using a standardised questionnaire.

Results 5402 individuals between 17 and 82 (median 33.5) years were included. Of those, 2550 (47.2%) were between 25 and 34 years old and 3133 were heterosexual (58%), with rising attendance over the years. One-third attended because of a new sexual relationship, and one-third reported condomless sex. Among all individuals, we found 191 (3.8%) new chlamydia infections (89/191 in females and 101/191 in males) and 54 (1.1%) gonorrhoea infections (44/54 in males). In addition, 52/5125 tested individuals (0.8%) had syphilis requiring treatment. The number of sexual partners, previous bacterial STIs and condomless sex were associated with having an STI. Four heterosexual individuals were newly diagnosed with HIV. People rated a low threshold offer (through online booking or telephone) and personal counselling as most important factors to attend the service.

Conclusion We found many asymptomatic bacterial STIs requiring treatment. Offering easily accessible STI testing and counselling proved successful as shown by increasing rates of attendance and high levels of satisfaction.

INTRODUCTION

In Switzerland, the incidence of all bacterial STI is rising in recent years.¹ In 2019, the Swiss Federal Office of Public Health reported 12 374 new cases of chlamydia, 3907 new cases of gonorrhoea and 1046 new cases of syphilis and 426 of HIV. In Switzerland, STI testing sites for asymptomatic persons typically focus on risk groups. Furthermore, the costs for STI tests are not fully covered by health insurances and have often to be covered by the persons own contributions.

Since 2017, the self-referral STI testing site at the Department of Infectious Disease at the University Hospital in Bern offers anonymous low-threshold

WHAT IS ALREADY KNOWN ON THIS TOPIC

⇒ STI testing in Switzerland is mainly risk group focused. Low threshold offers for other individuals remain expensive and scarce.

WHAT THIS STUDY ADDS

⇒ The study shows that a large proportion of individuals at our testing site were young heterosexual individuals. Among those, a relevant number of asymptomatic bacterial STIs, and four new HIV diagnoses were detected. Easy accessibility and personal counselling were rated as main motivations for attendance.

HOW THIS STUDY MIGHT AFFECT RESEARCH, PRACTICE OR POLICY

⇒ Low threshold testing sites with affordable prices and personal counselling are effective and should be more often implemented.

STI testing without clinical examination for all asymptomatic individuals regardless of their health insurance status. Appointments can be booked online or by telephone (waiting times generally less than a week), and the full STI screening can be self-paid at a much cheaper price (SFr150, €145), compared with testing during a regular consultation (SFr350). We performed a service evaluation study to assess people's attendance and satisfaction over time, to explore the need of such STI testing sites for the general population and to report the prevalence of bacterial (*Chlamydia trachomatis* (CT), *Neisseria gonorrhoea* (NG) and *Treponema pallidum* (TP)) and viral (HIV and hepatitis B) infections found in asymptomatic individuals.

METHODS

In this retrospective cohort study, we collected data from asymptomatic individuals who attended the anonymous STI testing site at the Department of Infectious Diseases at the University Hospital in Bern between January 2017 and December 2019. For these appointments, no personal identification is required, and test results are collected using a visit-specific code. As we do not collect any personal contact details, individuals need to call to receive their test results for further follow-up and treatment. In addition, sociobehavioural and self-reported vaccination data are collected with an anonymous online questionnaire created by the Federal Office of Public Health,² using the same



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Table 1 Univariable logistic regression model of associated factors/behaviour at the time of testing, stratified by presence of a positive test for a bacterial STI

	Bacterial STI			OR (95% CI)	P value
	Positive	Negative	Overall		
Overall	281	5121	5402		
Gender, n (%)					
Female	102 (36.3)	1854 (36.2)	1956 (36.2)	Ref.	
Male	178 (63.3)	3229 (63.1)	3229 (63.1)	1.0 (0.8 to 1.3)	0.988
Missing	1 (0.4)	38 (0.7)	39 (0.7)	–	
Mean age in years (SD)	31.4 (9.3)	33.6 (10.0)	33.5 (10.0)	0.98 (0.96 to 0.99)	< 0.001
Sexual orientation and behaviour, n (%)					
Heterosexual man	59 (21.0)	1790 (35.0)	1849 (34.2)	Ref.	
Heterosexual woman	77 (27.4)	1162 (22.7)	1239 (22.9)	2.0 (1.4 to 2.9)	< 0.001
MSM	59 (21.0)	594 (11.6)	647 (12.5)	4.1 (2.9 to 5.8)	< 0.001
Other or missing	65 (23.1)	1575 (30.8)	1640 (30.4)	–	
Paid for sex	22 (7.8)	517 (10.1)	539 (10.0)	1.4 (0.9 to 2.3)	0.139
Alcohol use for sex	37 (13.2)	563 (11.0)	600 (11.1)	1.2 (0.8 to 1.7)	0.390
Recreational drugs for sex	52 (18.5)	386 (7.5)	438 (8.1)	2.8 (2.0 to 3.8)	< 0.001
Condom use with casual sex partners, n (%)					
Always	47 (16.7)	1236 (24.1)	1283 (23.8)	Ref.	
Sometimes or never	88 (31.3)	1459 (28.5)	1547 (28.6)	1.6 (1.1 to 2.3)	0.013
Missing	146 (52.0)	2426 (47.4)	2572 (47.6)	–	
Previous STIs	61 (21.7)	584 (11.4)	645 (11.9)	2.2 (1.6 to 2.9)	< 0.001
Use of sex toys	69 (24.6)	1178 (23.0)	1247 (23.1)	1.1 (0.8 to 1.4)	0.690
Number of sex partners in total in last 12 months, n (%)					
0–2	49 (17.4)	1527 (29.8)	1576 (29.2)	Ref.	
3–5	81 (28.8)	1376 (26.9)	1457 (27.0)	1.8 (1.3 to 2.7)	0.001
6 or more partners	78 (27.8)	756 (14.8)	834 (15.4)	3.2 (2.2 to 4.7)	< 0.001
Missing	73 (26.0)	1462 (28.5)	1535 (28.4)	–	

Bacterial STI: chlamydia and/or gonorrhoea and/or syphilis positive. If not specified, reference categories for ORs are absence of the characteristic. MSM, men who have sex with men; OR, odds ratio.

visit-specific code. Positive test results are reported anonymously to the Federal Office of Public Health.

We used PCR testing for CT/NG of pooled swabs (pharynx, urethra/vagina and anus) and serum blood tests for HIV (fourth generation test) and syphilis (reverse sequence algorithm starting with a TP particle agglutination (TPPA) IgG/M test and adding rapid plasma reagin (RPR) if positive). Additionally, we offered testing and vaccination for hepatitis B. Furthermore, all people who attended our service between January 2020 and March 2020 were invited to complete a satisfaction questionnaire, which was handed out at the end of the appointment and returned directly by persons in an anonymous letter box or sent back by prepaid mail (online supplemental material).

We used median and IQR for continuous variables and the total (percentage) for categorical variables. For assessing the presence of chlamydia, gonorrhoea or syphilis at any visit (primary aim), differences between those with and without infection were investigated using the χ^2 test for categorical variables or the Wilcoxon rank-sum test for non-parametric, continuous variables. Descriptive associations between clinical and behavioural characteristics and infections were assessed with univariable logistic regression models. Throughout, we used a 5% level as statistically significant. All analysis were carried out using R (V.3.6.1.)

As all data were collected anonymously without recording any personal data, no permission of the ethical committee was needed for the present work (*Swiss Federal Act on Research involving Human Beings*, chapters 2b and 2c).³

RESULTS

Demographics, number of people attending and reason for attendance

During the study period, 5402 asymptomatic individuals were tested: 3407 (3407/5402, 63.1%) were men and 1956 (1956/5402, 36.2%) were women. Their ages ranged from 17 to 82 (median age 33.5), with individuals between 25 and 34 years being the most represented age group among both men and women. The majority was of Swiss nationality (4738/5402, 87.7%). A total of 3153 (3153/5402, 58.4%) people identified as heterosexual, 396 (396/5402, 7.3%) as homosexual and 301 (301/5402, 5.6%) as bisexual.

Over 3 years visits have increased by 36.2% from 2017 (n=1385) to 2018 (n=1887) and by 12.9% from 2018 (n=1887) to 2019 (n=2130, p value for trend=0.13).

According to the self-completed questions, the five main reasons why people attended the STI testing site in Bern were having a new sexual relationship (31.5%), routine check-up (31.2%), having had condomless sex (28.6%) or condom failure (15.7%). Oral sex was mentioned in 6% and 12.6% of people gave other reasons for attending the STI testing site.

Bacterial STIs (chlamydia, gonorrhoea and syphilis)

We identified 191 cases of CT (3.8%), 54 cases of NG (1.1%) and 42 cases of syphilis (0.8%). Chlamydia infection was found in 101 men (52.9%) and 89 (46.6%) women, of whom 112

(58.6%) identified as heterosexual. Of the 54 gonorrhoea cases, 45 (81.5%) were diagnosed in men (13 heterosexual, 22 men who have sex with men (MSM), 10 bisexual or unknown) and 6 (18.5%) in women. Syphilis was diagnosed in 35 men (5 heterosexual, 30 MSM) and in three heterosexual women.

Compared with individuals with 0–2 sex partners in the last 12 months, people with six or more sex partners had higher odds of acquiring any bacterial STI and MSM had increased odds of contracting a bacterial STI compared with heterosexual individuals. We found no associations between STI and paying for sex nor alcohol use before or during sex. People who used party drugs or individuals who reported past STIs were more likely to be diagnosed with a bacterial STI (table 1).

HIV and vaccinations against hepatitis B and HPV

We identified four new HIV infections, all of which were found in heterosexual individuals (4/7123, 0.06%): there were three females and one male, with an age range between 21 and 37 years. Nearly 60% of people (3151/5402, 58.3%) were vaccinated against hepatitis B, but only a minority was vaccinated against HPV (696/5402, 12.9%). Of those vaccinated against HPV, only 77/696 (11.1%) were men.

User-friendliness questionnaire

The survey questionnaire on motivational factors and satisfaction was answered by 175 (175/517, 33.8%) of people. The most important factors to attend our service were the low-threshold offer and personal counselling. Anonymity and discrete payment were rated as less important. The most important topics for people to be discussed during a personal consultation at the STI testing site were: pathogens of STIs, risk factors for STIs, partner notification, safer sex rules, discussion of HIV pre- and post-exposure prophylaxis (PrEP/PEP), and questions around HPV.

DISCUSSION

After implementation of this low-threshold STI testing site in Bern, the numbers of people attending the STI testing site rose each year. We found a combined prevalence of bacterial STIs (active syphilis, NG and CT) in asymptomatic people of 5.5% and detected four new HIV infections in heterosexuals. All those individuals required treatment to avoid complications and to limit onward transmission. In addition, we found a low vaccination rate against hepatitis B and HPV. The most important factors for people to attend were easy access, low threshold and personal counselling.

Our testing site is targeted to asymptomatic people. Our STI prevalence aligns well with previously published estimates, with chlamydia being the most frequent among asymptomatic infections.^{4 5} Unfortunately, asymptomatic infections are less likely to be diagnosed but can drive onward transmission. Researchers found that young persons who underwent STI testing at one stage are more likely to repeat it in the future.⁶ In our testing site, we applied pooled testing, always including a pharyngeal swab since NG and CT are transmitted through vaginal or anal intercourse and through oral sex.^{6 7} Data from mathematical models suggest that kissing and saliva exchange during sexual activity might be major contributors to community gonorrhoea transmission.⁸ We noticed that personal counselling seemed an important factor to attend our STI testing site. This is reflected in a low use of home testing in Switzerland. Talking about their sexual health seems well acceptable and appreciated. As shown in a former Swiss study,

76.2% of 1452 would like their physician to talk about their sexual life, but only 40.5% reported ever having had this discussion.⁹

The strength of this study is the detailed data on sexual behaviour and the reliable estimate of STI prevalence, the report of attendance over time, as well as people's satisfaction in order to improve our testing site. The weaknesses of the study include its single-centre design with a small sample size, and the pooling of swabs that precluded the assessment of a site-specific STI prevalence. In addition, as the service satisfaction data could not be linked to demographic data, generalisability of our findings cannot be confirmed with certainty.

In conclusion, our study indicates the need for easily accessible and affordable STI testing for all individuals to detect, treat and limit onward transmission of STIs in Switzerland. Future efforts should include raising awareness for vaccinations against hepatitis B and HPV.¹⁰

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Contributors DB, KA-P and AR developed and designed the study. BS planned and performed the statistical analyses. DB and KA-P wrote the manuscript with inputs from BS, TK and CVH. AR and HF contributed with their professional expertise, and reviewed and discussed the analyses and the manuscript.

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Anonymous HIV- and STI-testing site, Department of Infectious Disease, University Hospital Bern

This questionnaire is used to collect data for a dissertation at the University of Bern about the epidemiology of sexually transmitted infections (STIs). The main aim is to optimize the user-friendliness of our service. All information is voluntary and anonymous. The data will be treated confidentially, not passed on to third parties, and used exclusively for the dissertation in order to improve our service quality.

Date:

Date of birth:

1. What gender do you identify as today?

- Man
- Woman
- Undefined

2. Who do you (also just occasionally) have sexual relations with?

- Men
- Women
- Both

3. Which factors are important for you when attending the STI testing site?

	(5) = most important	(4) = important	(3) = indifferent	(2) = not important	(1) = least important
Anonymity	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cost	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Discrete payment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Online registration	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Location	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Notification of results (E-mail, telephone call)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Offer of testing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Personal counselling	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

4. Which topics do you find important to be discussed during your personal consultation?

	(5) = most important	(4) = important	(3) = indifferent	(2) = not important	(1) = least important
Common infections	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Protection (e.g. condom use)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Risk factors for STIs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PEP and PREP	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
HPV	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Partner notification	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

5. What are possible improvements to the STI testing site?

Website (e.g. user friendliness)	<input type="checkbox"/>
Drop in appointments (without planned appointment)	<input type="checkbox"/>
Notification system	<input type="checkbox"/>
Waiting room	<input type="checkbox"/>
Location of testing site (accessibility)	<input type="checkbox"/>

Other suggestions of improvement:

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Einleitung

Der Zugang zu einem günstigen Testangebot für sexuell übertragbare Infektionen (STI) ist wichtig, um weitere Übertragungen zu verhindern. Unsere Teststelle bietet ein niederschwelliges und preisgünstiges Angebot für die Allgemeinbevölkerung an. In diesem Artikel erläutern wir die Prävalenz von STIs und die wichtigsten Motivationsfaktoren, dieses Testangebot zu nutzen.

Material und Methoden

Im Zeitraum von 2017 bis 2019 wurden alle Teilnehmer unserer Teststelle am Universitätsspital in Bern mit einem computerbasierten Fragebogen befragt. Gepoolte Abstriche (oral, genital, anal) wurden auf *Chlamydia trachomatis*, *Neisseria gonorrhoeae* und Blutproben auf Syphilis und HIV getestet. Die wichtigsten motivierenden Faktoren für Besucher wurden durch einen standardisierten Fragebogen erörtert.

Ergebnisse

5402 Personen zwischen 17 und 82 Jahren (Median 33.5) wurden eingeschlossen. 2550 (47.2%) waren 25-34 Jahre alt und 3133 (58%) heterosexuell, mit steigenden Besucherzahlen über drei Jahre. Ein Drittel kam wegen einer neuen sexuellen Beziehung, ein Drittel erwähnte als Grund Sex ohne Kondom. Insgesamt wurden 191 (3.8%) neue Fälle mit Chlamydien (89/191 bei Frauen und 101/191 bei Männern) und 54 (1.1%) Fälle mit Gonorrhö (44/54 bei Männern) gefunden. Ausserdem wurden 52/5125 Personen (0.8%) mit einer therapiepflichtigen Syphilis-Infektion diagnostiziert. Die Anzahl von Sexualpartnern, STIs in der Anamnese und kondomloser Sex waren mit dem Auftreten einer STI assoziiert. Vier heterosexuelle Personen erhielten eine Neudiagnose mit HIV. Die Besucher erwähnten den niederschweligen Zugang (durch online Buchung oder Anruf) und eine persönliche Beratung als wichtigste motivierende Faktoren, die Teststelle zu besuchen.

Zusammenfassung

Wir fanden viele asymptomatische bakterielle STIs, die einer Behandlung bedurften. Das niederschwellige Angebot und die Beratung zeigten Erfolg, welcher sich in steigenden Besucherzahlen und in grosser Zufriedenheit bei der Besucherumfrage widerspiegelte.