

SELF-REPORTED SEXUALLY TRANSMITTED INFECTIONS AND HEALTHCARE IN SLOVENIA: FINDINGS FROM THE SECOND NATIONAL SURVEY OF SEXUAL LIFESTYLES, ATTITUDES AND HEALTH, 2016-2017

POROČANE SPOLNO PRENESENE OKUŽBE IN ZDRAVSTVENA OSKRBA V SLOVENIJI: IZSLEDKI DRUGE NACIONALNE RAZISKAVE ŽIVLJENJSKI SLOG, STALIŠČA, ZDRAVJE IN SPOLNOST, 2016-2017

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ABSTRACT

Introduction: Objectives were to estimate the lifetime prevalence of self-reported sexually transmitted infections (STIs) and describe STIs healthcare.

Keywords: sexually transmitted infections, prevalence, healthcare, general population, surveys, Slovenia

Methods: Data was collected in the period 2016-2017 from a probability sample of the general population, 18-49 years old, at respondents' homes by a combination of face-to-face interviews and self-administration of more sensitive questions. Statistical methods for complex survey data were used to account for stratification, clustered sampling, and weighting.

Results: Approximately every tenth sexually experienced individual reported to have had genitourinary symptoms suggestive of STIs, but only a minority of them reported to have had those respective STIs diagnosed. The proportion of sexually experienced individuals that reported to have ever been diagnosed with an STI (excluding trichomoniasis, pubic lice for men and women, and pelvic inflammatory disease, vaginal thrush, bacterial vaginosis for women) was 2.4% for men and 6.7% for women ($p < 0.001$). Independent risk factors associated with self-reported STIs in women included at least 10 lifetime sexual partners and having been forced into sex. The majority of the last STI episodes in women were treated by gynaecologists accessible at the primary healthcare level and in men by a dermatovenerologist, after referral by a general practitioner. Approximately half of STI patients were counselled for safer sex and majority reported to have notified their sexual contacts.

Conclusions: Our estimates for lifetime prevalence of self-reported STIs in a probability sample of Slovenian sexually experienced men and women, 18-49 years old, indicate a substantial national burden of STIs. The results will inform national STI prevention and control policies and strategies.

IZVLEČEK

Uvod: Cilji raziskave so bili oceniti prevalenco poročanih spolno prenesenih okužb (SPO) v življenju ter nekaterih drugih okužb spolovil in sečil ter opisati zdravstveno oskrbo SPO.

Ključne besede: spolno prenesene okužbe, prevalenca, zdravstvena oskrba, splošno prebivalstvo, presečne raziskave, Slovenija

Metode: Podatki so bili zbrani v obdobju 2016-2017 v verjetnostnem vzorcu prebivalcev, starih 18-49 let, na njihovih domovih s kombinacijo računalniško podprtega anketiranja in samoizpolnjevanja vprašalnikov z občutljivejšimi vprašanji. Analizirani so bili s statističnimi metodami, ki upoštevajo stratifikacijo, kopičenje pri vzorčenju in uteženost podatkov.

Rezultati: Približno vsaka deseta spolno izkušena oseba je poročala, da je že imela bolezenske težave na spolovilih in sečilih, ki bi lahko bile posledica SPO, vendar je med njimi le manjši delež poročal, da jim je zdravnik že postavil diagnozo SPO. Med spolno izkušenimi je manj moških (2,4 %) kot žensk (6,7 %) poročalo, da jim je zdravnik že postavil diagnozo vsaj ene SPO (klamidijske okužbe, gonoreje, nespecifičnega uretritisa, sifilisa, genitalnih bradavic, genitalnega herpesa ali hepatitisa B) ($p < 0,001$). Med bakterijskimi so bile najpogostejše klamidijske okužbe (moški: 0,8 %; ženske: 3,1 %) in med virusnimi genitalne bradavice (moški: 0,7 %; ženske: 3,0 %). Ženske, ki so imele v življenju najmanj 10 spolnih partnerjev, in tiste, ki so bile že prisiljene v spolne odnose, so imele višji obet za vsaj eno diagnozo SPO v življenju. Večino zadnjih epizod SPO pri ženskah so zdravili ginekologi, pri moških pa dermatovenerologi. Približno polovica jih je poročala, da so jim svetovali glede varnejše spolnosti, in večina, da so o diagnozi SPO obvestili vse svoje spolne partnerje ali večino. O diagnozi trihomoniase ni poročal noben spolno izkušen moški in le 0,9 % spolno izkušenih žensk in o diagnozi srarnih uši 0,2 % moških in 0,6 % žensk. Vsaki tretji ženski (33,6 %) je zdravnik že postavil diagnozo glivičnega vnetja nožnice (kandida), medtem ko je bila diagnoza bakterijske vaginoze veliko redkejša (3,3 %). Da so že imele vnetje v mali medenici, pa je poročalo 1,5 % spolno izkušenih žensk.

Zaključki: Naše ocene prevalence poročanih SPO v vsem življenju v verjetnostnem vzorcu spolno izkušenih prebivalcev Slovenije, moških in žensk, starih 18-49 let, nakazujejo pomembno breme SPO. Razlika v poročani pogostosti diagnoz SPO med moškimi in ženskami je bila predvidoma vsaj delno posledica tega, da imajo ženske neposreden dostop do specialistične obravnave SPO pri ginekologu na primarni ravni, medtem ko moškim specialistična obravnava SPO pri dermatovenerologu ni dosegljiva brez nاپotitve izbranega osebnega zdravnika. Rezultati bodo v pomoč pri poučenem načrtovanju nacionalnih politik in strategij preprečevanja ter obvladovanja SPO.

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1 INTRODUCTION

Sexually transmitted infections (STIs) are among the most common communicable conditions (1). In 2016, the sixty-ninth World Health Assembly adopted the Global health sector strategy on sexually transmitted infections, 2016-2021 (2). To plan prevention and control of STIs, it is critical to understand how common STIs are and what the associated risk factors are. It is also important to understand which specialists treat patients with STIs, whether patients receive preventive counselling for safer sex, and whether their sexual contacts are notified.

Surveillance of STIs in Slovenia is based on mandatory notification of diagnosed cases (3). Reported incidence rates underestimate the true occurrence of STIs (3, 4). Population based studies added to our understanding of how common infections with *Chlamydia trachomatis* and human papilloma virus are, including genital warts (5-9). The first estimate for self-reported lifetime prevalence of STIs among sexually experienced individuals, 18-49 years old, in 1999-2000, was obtained in the first Slovenian National Survey of Sexual Lifestyles, Attitudes and Health (10).

To inform national STIs prevention and control policies, some of the objectives of the second Slovenian National Survey of Sexual Lifestyles, Attitudes and Health conducted in a probability sample of the general population, 18-49 years old, in 2016-2017 were: (a) to estimate the proportion of men and women who reported to have had genitourinary symptoms that could be suggestive of STIs at least once during their lifetime and among them the proportion of those who were ever diagnosed with corresponding STIs, (b) to estimate the proportion of men and women who reported to have had genitourinary symptoms that could be suggestive of STIs during last year, (c) to estimate the proportion of men and women who have already been diagnosed with at least one of STIs and to identify associated demographic and behavioural risk factors, (d) to estimate the proportion of men and women who have already been diagnosed with some other genital infections or the proportion of infections of female reproductive organs, (e) to describe the specialties of physicians who treated the most recent STI episodes of men and women, (f) to estimate the proportion of men and women who received counselling for safer sex when treated for their most recent STI episode by a physician, and (g) to estimate the proportion of men and women with diagnosed STIs who notified their contacts when experiencing their most recent STI episode.

2 METHODS

A stratified, two-stage probability sample of the general population, aged 18-49, comprising 4000 individuals, was selected from the Central Population Registry (excluding those living in institutional setting such as prisons, monasteries, etc.). Data were collected between October 2016 and July 2017 at respondents' homes using a combination of computer-assisted, face-to-face interviewing and self-completion of questionnaires with more sensitive questions. Respondents were asked in the self-completion questionnaire about the last time they experienced genitourinary symptoms suggestive of STIs (urethral discharge accompanied by pain during urination, painful multiple vesicular or ulcerative lesions in the genital area, painless ulcers in the genital area) and whether they had ever been diagnosed with STIs (chlamydia, gonorrhoea, non-specific urethritis, syphilis, genital warts, genital herpes, hepatitis B). Respondents were not asked whether they had ever been diagnosed with HIV. In addition, women were asked about the history of vaginal thrush (candidiasis), bacterial vaginosis, and pelvic inflammatory disease, and both men and women about the history of trichomoniasis and pubic lice, infections of which a substantial proportion may have not been sexually acquired. Questions about sexual behaviour were also asked in the self-completion questionnaire. Questions about respondents' sociodemographic characteristics were asked face-to-face.

Weights were computed to adjust for the differences in survey response between men and women, different age groups, regions, types and sizes of settlements based on Central Population Registry data on 1st January 2017. Statistical methods for complex survey data (STATA Release 15.1) were used to account for stratification, clustered sampling, and weighting. Weighted proportion estimates for outcomes of interest with 95% confidence intervals (95% CI) were computed separately for men and women. Tests for heterogeneity of proportions were computed by using the usual Pearson chi-squared test; however, based on F statistics with noninteger degrees of freedom using a second-order Rao and Scott correction accounting for the survey design. When the point prevalence estimates in any group of individuals was 0%, we presented them together with the one-sided binomial 97.5% CI (exact method). The weighted bases for percentages quoted in tables are rounded to the nearest integer and unweighted counts of individuals are shown also.

We defined sexually experienced individuals as those who ever had heterosexual penetrative intercourse (vaginal, oral, or anal), and/or homosexual penetrative intercourse (oral and/or anal), and/or homosexual genital contact. Vaginal thrush (candidiasis), bacterial vaginosis, pelvic inflammatory disease, trichomoniasis, and pubic lice were omitted from analyses of associations between reporting to have ever been diagnosed with STI and selected sociodemographic and behavioural risk factors because a substantial proportion of those infections may have not been sexually acquired. Cases of non-specific urethritis and hepatitis B were included, although some may also not have been sexually acquired. Univariate analyses of association between at least one self-reported STI and explanatory variables were performed by logistic regression to obtain pseudo-maximum likelihood estimates of odds ratios (OR) together with 95% CI, and the results of adjusted Wald tests for significance using all available data. Variables were included in a series of logistic regression multivariate models, if they were associated with the outcome at the significance level of $p < 0.1$ in univariate analyses or were statistically significantly associated with the outcome in the equivalent multivariate model for the other gender. Records with missing data for any variables in the final multivariate logistic regression models were excluded from the final models (complete-subject analysis). Pseudo-maximum likelihood adjusted odds ratios (aOR) with 95% CI for all variables left in the final models and the results of adjusted Wald tests for significance were computed.

3 RESULTS

Data was collected from 1929 people (902 men, 1027 women), corresponding to a survey response of 55.5% (51.6% among men, 59.5% among women). Having ever had heterosexual penetrative intercourse (vaginal, oral, or anal), and/or homosexual penetrative intercourse (oral or anal), or genital contact was reported by 96.3% (95% CI: 94.9%-97.4%) of men and 96.6% (95% CI: 95.1%-97.6%) of women.

Among these sexually experienced individuals, 9.4% (95% CI: 7.6%-11.7%) of men and 12.8% (95% CI: 10.8%-15.2%) of women reported that they had already experienced genitourinary symptoms during their lifetime that could be suggestive of STIs. Having ever had urethral discharge accompanied by pain during urination was reported by 4.6% (95% CI: 3.3%-6.4%) of men and having had it within the last year by 1.6% (95% CI: 0.9%-2.8%). Among those men who have ever had urethral discharge, 21.6% (95% CI: 10.7%-38.6%) reported ever having been diagnosed with chlamydial infection or non-specific urethritis or gonorrhoea. Having ever had painful multiple vesicular or ulcerative lesions in the genital area was reported by 5.2% (95% CI: 3.8%-7.0%) of men and 10.6% (95% CI: 8.8%-12.8%) of women and within the last year by 2.0% (95% CI: 1.2%-3.4%) of men and 4.2% (95% CI: 3.0%-5.9%) of women. Among those who had ever had painful multiple vesicular or ulcerative lesions in the genital area, among men no one reported ever having been diagnosed with genital herpes (one-sided 97.5% CI: 0.0%-9.3%), while a diagnosis of genital herpes was reported by 6.8% (95% CI: 2.9%-14.9%) of such women. Ever having had painless ulcers in the genital area was reported by 3.3% (95% CI: 2.3%-4.9%) of men and 6.5% (95% CI: 4.9%-8.5%) of women and within the last year by 1.3% (95% CI: 0.7%-2.4%) of men and 2.7% (95% CI: 1.8%-4.1%) of women. Among those who had ever had painless ulcers in the genital area, not a single man or woman reported ever having been diagnosed with syphilis. The proportions of sexually experienced men and women who reported having ever been diagnosed with various STIs, some other genital infection, or infection of female reproductive organs are shown in Table 1.

Table 1. Lifetime prevalence of self-reported sexually transmitted infections and some other genital infections or infections of female reproductive organs, sexually experienced men and women, 18-49 years old, 2016-2017, Slovenia.

	Men				Women			
	Proportion	95% CI (%)	Base		Proportion	95% CI (%)	Base	
			UW	W			UW	W
Chlamydia	0.8%	(0.3-1.8)	794	884	3.1%	(2.1-4.4)	924	841
Gonorrhoea	0.2%	(0.1-1.0)	792	883	0.2%	(0.0-1.1)	925	842
Non-specific urethritis	0.3%	(0.1-1.3)	792	883	-	-	-	-
Syphilis	0.1%	(0.0-0.9)	793	885	0.0%	(0.0-0.4) ^a	928	844
Any bacterial STI	1.3%	(0.7-2.5)	790	880	3.1%	(2.1-4.4)	922	840
Genital warts	0.7%	(0.3-1.6)	791	882	3.0%	(2.0-4.5)	925	842
Genital herpes	0.1%	(0.0-0.9)	792	883	0.9%	(0.5-1.9)	928	844
Hepatitis B	0.3%	(0.1-1.0)	792	883	0.1%	(0.0-0.7)	927	843
Any viral STI	1.1%	(0.6-2.1)	790	881	3.8%	(2.6-5.3)	924	841
Any bacterial or viral STI	2.4%	(1.5-3.8)	789	879	6.7%	(5.3-8.6)	921	839
Trichomoniasis	0.0%	(0.0-0.4) ^a	792	883	0.9%	(0.4-1.9)	927	844
Pubic lice	0.2%	(0.0-1.2)	794	885	0.6%	(0.3-1.5)	928	844
Unknown STI	0.1%	(0.0-0.9)	793	884	0.3%	(0.1-0.9)	927	843
Vaginal thrush (candidiasis)	-	-	-	-	33.6%	(30.3-37.1)	929	845
Bacterial vaginosis	-	-	-	-	3.3%	(2.3-4.8)	927	843
Pelvic inflammatory disease	-	-	-	-	1.5%	(0.9-2.5)	928	844

Legend: STI=sexually transmitted infection, CI=confidence interval, UW=unweighted number of individuals, W=weighted number of individuals

^a One-sided binomial 97.5% confidence interval

Fewer men (2.4%; 95% CI: 1.5%-3.8%) than women (6.7%; 95% CI: 5.3%-8.6%) reported that they have already been diagnosed with at least one of STIs ($p < 0.001$). Among both men and women, the most commonly reported bacterial STI was chlamydia and the most commonly reported viral STI were genital warts.

More than one diagnosis of STIs during their lifetime was reported by 0.1% (95% CI: 0.0%-0.9%) of men and 0.5% (95% CI: 0.2%-1.4%) of women. A total of 19 STI episodes were reported by 18 sexually experienced men and 67 STI episodes by 62 sexually experienced women (unweighted counts). That the most recent episode of STI had been treated by a physician was reported by 16 men and 58 women (unweighted counts). Self-administration of antibiotics was reported by one man and one woman. Two women reported other self-treatment approaches, one of them treating a chlamydial infection with yoghurt.

The proportions of most recent episodes of STIs treated by physicians of various specialties among all STI episodes treated by physicians are shown in Table 2.

Gynaecologists treated majority of last STI episodes in women, while the most frequently reported physicians' specialty for the treated STIs in men was dermatovenerologist, followed by general practitioner.

The question "Have you told your sexual partner or your sexual partners about your last STI episode?" was answered by 9 men and 46 women (unweighted counts), corresponding to half of men and approximately three-quarters of women who reported STI episodes. All men and 43 women remembered whether they had or had not notified their sexual partner or partners. Among these, 8 men told their only sexual partner or all sexual partners and 1 told none, and 35 women told their only sexual partner or all of them, 6 to some but not all, and 2 to none.

The question "Have you ever been counselled about safer sex and condom use?" was answered by 9 men and 42 women (unweighted counts) who were treated by physicians for their last STI episode, corresponding to half of such men and approximately two-thirds of such women. Two women reported not remembering. Counselling was received by two of three men treated by a dermatovenerologist, while none of three men were treated by a general practitioner, and one of two men was treated

Table 2. Proportions of most recent episode of self-reported sexually transmitted infections treated by physicians according to their specialties, sexually experienced men and women, 18-49 years old, 2016-2017, Slovenia

	Men				Women			
	Proportion	95% CI (%)	Base		Proportion	95% CI (%)	Base	
			UW	W			UW	W
Gynaecologist	3.6%	(0.5-22.3)	1	1	83.3%	(69.8-91.5)	49	44
Dermatovenerologist	47.2%	(24.0-71.6)	7	9	8.9%	(3.1-22.7)	4	5
General practitioner	24.6%	(8.9-52.2)	4	4	4.6%	(1.4-14.2)	3	2
Urologist	13.4%	(3.1-42.6)	2	2	1.4%	(0.2-10.0)	1	1
Infectologist	11.3%	(2.8-36.2)	2	2	1.7%	(0.2-11.9)	1	1
Specialty	100%	-	16	18	100%	-	58	53

Legend: CI=confidence interval, UW=unweighted number of individuals, W=weighted number of individuals. Sexually transmitted infections include chlamydia, gonorrhoea, non-specific urethritis, syphilis, genital warts, genital herpes, and hepatitis B.

by urologist. The only man treated by an infectologist was counselled. Among women, counselling was received by 17 of 33 treated by a gynaecologist, and by all 3 treated by a dermatovenerologist, none of the 2 treated by general practitioner, and only 1 treated by a urologist. The only woman reporting being treated by infectologist was not counselled.

The proportions of sexually experienced men and women who reported at least one diagnosis of STI during their lifetime according to different age groups and sexual behaviour lifestyles are shown in Table 3.

In comparison to younger men, the proportion of those reporting at least one STI during their lifetime was eight times higher among those old 30 years or more (0.4% and 3.2%; $p=0.03$), while such statistically significant differences were not found among respective age groups of women (5.4% and 7.3%; $p=0.31$). Women with at least 10 sexual partners during their lifetime reported at least one STI more frequently than those with fewer lifetime sexual partners, 14.9% and in comparison to 5.7% ($p<0.01$). Respective proportions among men were 4.0% and 1.9% ($p=0.13$). Self-reported STIs at least once during their lifetime were also more frequent among men and women who reported having ever had same-sex partners in comparison to those with partners of the opposite sex only. Respective proportions among men were 10.3% and 2.2% ($p=0.04$) and among women 18.1% and 6.1% ($p<0.01$). Men and women who reported having had sex at least once during their lifetime with someone else while already involved in one sexual relationship (therefore having had concurrent sexual partners) reported having had at least one STI during their lifetime more frequently than others. Respective proportions among men were 4.3% in comparison to 1.7% ($p=0.05$) and among women 11.2% in comparison to 5.8% ($p=0.02$). Also women who reported having had at least two sexual partners without consistent condom use (not used condoms on 100% of

sex occasions) during the last year reported having STIs diagnosed more frequently (21.0%) than those who had not used a condom consistently with only one partner last year (6.3%) or those who reported not having any sexual partners without consistent condom use in the last year (7.1%) ($p=0.01$). Finally, ever having had a diagnosis of STI was reported more frequently by women who reported having been forced into sex by a man at least once during their lifetime (14.6%) in comparison to those who had never been forced into sex (5.7%) ($p<0.01$).

Only a few of these risk factors were associated with at least one self-reported STI ever in multivariate analyses. Men at least 30 years old had almost 10 times higher odds of at least one STI ever than younger men (aOR: 9.2; 95% CI: 1.2-69.8; $p=0.03$). Several risk factors were associated with at least one self-reported STI ever among women with various sexual behaviour characteristics. Women who reported at least 10 sexual partners during their lifetime had almost three times higher odds of at least one STI during their lifetime in comparison to those with fewer lifetime sexual partners (aOR: 2.6; 95% CI: 1.2-5.5; $p=0.01$). Women who reported at least two sexual partners without consistent condom use in the last year had almost three times higher odds of at least one STI during their lifetime in comparison to those who reported no partners without consistent condom use in the last year (aOR: 2.6; 95% CI: 0.9-7.7; $p=0.05$). Finally, women who had been forced into sex by a man at least once during their lifetime had almost three times higher odds of at least one STI during their lifetime in comparison to others (aOR: 2.6; 95% CI: 1.3-5.4; $p=0.01$).

Table 3. Self-reported sexually transmitted infections among sexually experienced men and women, 18-49 years old, according to demographic and behavioural characteristics, and results of univariate and multivariate analysis, 2016-2017, Slovenia.

	Men				Women			
	Proportion (95% CI)	Base UW, W	(p) OR	(p) aOR 95% CI	Proportion (95% CI)	Base UW, W	(p) OR	(p) aOR 95% CI
Age group			(p=0.03)	(p=0.03)			(p=0.31)	(p=0.37)
18-29	0.4% (0.0-2.4)	246, 255	1	1	5.4% (3.2-8.9)	261, 247	1	1
30-49	3.2% (2.0-5.2)	543, 624	9.6	9.2	1.2-69.8	660, 592	1.4	1.3
Number of sexual partners lifetime			(p=0.44)	(p<0.01)				
1	0.9% (0.1-6.1)	85, 99	1	1	3.3% (1.6-6.4)	237, 208	1	1
2	1.0% (0.1-7.0)	96, 107	1.1	1.1	3.9% (1.8-8.3)	134, 117	1.2	1.2
3-4	1.7% (0.4-6.5)	176, 192	1.9	1.9	8.8% (5.6-13.6)	221, 198	2.9	2.9
5-9	2.8% (1.3-5.7)	252, 273	3.1	3.1	6.2% (3.6-10.3)	226, 216	1.9	1.9
≥ 10	4.0% (1.9-8.3)	178, 205	4.6	4.6	14.9% (8.6-24.4)	101, 97	5.2	5.2
≥10 sexual partners lifetime			(p=0.13)	(p=0.16)			(p<0.01)	(p=0.01)
No	1.9% (1.0-3.4)	609, 672	1	1	5.7% (4.3-7.6)	818, 739	1	1
Yes	4.0% (1.9-8.3)	178, 205	2.2	2.0	14.9% (8.6-24.4)	101, 97	2.9	2.6
Ever same-sex experience			(p=0.04)	(p<0.01)				
No	2.2% (1.3-3.6)	769, 856	1	1	6.1% (4.7-7.8)	873, 790	1	1
Yes	10.3% (2.5-33.9)	19, 23	5.2	5.2	18.1% (8.4-34.7)	47, 48	3.4	3.4
Concurrency lifetime			(p=0.05)	(p=0.02)				
No	1.7% (0.9-3.2)	572, 634	1	1	5.8% (4.2-7.8)	756, 683	1	1
Yes	4.3% (2.2-8.3)	213, 240	2.7	2.7	11.2% (7.1-17.1)	163, 154	2.1	2.1
Number of sexual partners without consistent condom use last year			(p=0.01)	(p=0.01)				
0	1.4% (0.4-4.4)	207, 226	-	-	7.1% (4.1-11.9)	186, 163	1	1
1	3.2% (1.9-5.4)	463, 525	-	-	6.3% (4.6-8.5)	628, 581	0.9	0.8
≥ 2	0.0% (0.0-5.9) ^a	56, 61	-	-	21.0% (10.4-37.8)	37, 34	3.5	2.6
Coercive sex			(p=0.01)	(p=0.01)				
No	-	-	-	-	5.7% (4.3-7.5)	818, 740	1	1
Yes	-	-	-	-	14.6% (8.4-24.1)	98, 94	2.8	2.6

Only 787 men and 846 women with complete data were included in the final multivariate logistic regression model.

Legend: STIs=sexually transmitted infections (any of the following: gonorrhoea, syphilis, chlamydia, genital herpes, genital warts, non-specific urethritis, hepatitis B), CI=confidence interval, UW=unweighted number of individuals, W=weighted number of individuals, OR=odds ratio, aOR=adjusted odds ratio.

^a one-sided binomial 97.5% confidence interval p value for test for heterogeneity of proportions

4 DISCUSSION

Our results show substantial lifetime burden of STIs in the Slovenian general population, 18-49 years old. Approximately every tenth sexually experienced individual reported having ever had genitourinary symptoms that could be suggestive of STIs at least once during their lifetime. Only a minority of them reported having ever had respective STIs diagnosed. This suggests that people with genitourinary symptoms may not always seek healthcare, or if they do, STIs may not be always diagnosed.

A substantial proportion of sexually experienced men and women, although fewer men than women (2.4% versus 6.7%; $p < 0.001$), reported that they had been diagnosed with at least one of STIs during their lifetime. Some of this difference between genders, which is not consistent with STI surveillance data (3), may have resulted from the difference in access to STI specialist healthcare. Gynaecologists that are accessible to women at the primary healthcare level treated a great majority of women's last STI episodes, while the majority of the last STI episodes in men were treated at the secondary healthcare level by dermatovenerologist after a necessary referral by a general practitioner. In addition, men, who have sex with men, who bear a disproportionate burden of STIs (3), may have been underrepresented in our survey sample. Only 1.2% (95% CI: 0.6%-2.2%) of male respondents reported having had sex with men during the previous five years, while the European MSM internet survey (EMIS) conducted in 2009 estimated that the proportion of Slovenian men who have sex with other men exceeded 3% of the adult male population (11). It is also worth noting that the difference in the proportion of men and women reporting that they had already experienced genitourinary symptoms that could be suggestive of STIs was not statistically significant.

The true lifetime prevalence of STIs in the Slovenian general population, 18-49 years old, must be higher than suggested by our results. Our estimates include only individuals who had sought healthcare when experiencing symptoms suggestive of STIs, who had access to diagnostic testing, who were found to be positive, had been informed about the diagnosis, and had anonymously reported the result in the self-administered questionnaire. Also not all STIs are symptomatic. Among 452 men (unweighted count) who contributed their first void urine specimen at the time of the survey and were confidentially tested for chlamydia infection, 2 had a chlamydia infection diagnosed, but none of them reported urethral discharge accompanied by pain during urination at the time of the survey (unpublished data).

Among both, men and women, the most commonly reported bacterial STI was chlamydia and the most commonly reported viral STI was genital warts. This is

consistent with Slovenian STI surveillance data and the results of respective population-based surveys (3, 5, 7, 8). STIs case management should include prevention counselling to encourage risk reduction (including information on how to use condoms correctly) and support for partner notification (12, 13). Counselling for safer sex and condom use when treated for their last STI episode was reported by approximately half of respondents only, while a majority reported having notified all or at least some of their sexual partners.

Although those at higher behavioural risk more frequently reported a diagnosis with at least one STI during their lifetime, since our sample size was relatively small, only a few risk factors were associated with at least one self-reported STI in multivariate analyses. Older individuals with longer periods of sexual activity would be expected to have a higher lifetime prevalence of STIs. In fact, men at least 30 years old had almost 10 times higher odds of at least one STI in their lifetimes than younger men, while the difference between at least 30-year-old women and younger women was not statistically significant, suggesting a possible cohort effect. Younger women may have had on average a higher risk behaviour for the acquisition of STIs in comparison to older women in their younger age. In fact, the estimated average number of accumulated lifetime heterosexual partners for women 18-29 years old was 4.5, almost as high as for women 30-49 years old, which was 4.9 (unpublished data). Several risk factors were associated with at least one self-reported STI among women. As expected, women who reported at least 10 sexual partners during their lifetime had almost three times higher odds of at least one STI ever in comparison to those with fewer lifetime sexual partners, and women who reported at least two sexual partners without consistent condom use last year had almost three times higher odds of at least one STI ever in comparison to those who reported no partners without consistent condom use last year. In addition, women who had been forced into sex by a man at least once had almost three times higher odds of at least one STI lifetime in comparison to others. It has been suggested before that women who experience coerced or forced sex and sexual intimate partner violence have increased rates of STIs including HIV (14, 15).

The methodological strengths of our survey included an excellent general population sampling frame, the Slovenian Central Population Register, use of two-stage probability sampling strategy, sufficiently high survey response (55.5%), and use of almost identical methods to those used in the first Slovenian national survey "Sexual lifestyles, attitudes and health", which had been thoroughly pretested and piloted after adaptation from the British National Surveys of Sexual Attitudes and Lifestyles (16-18). To minimise non-participation bias, we weighted our survey data for differential non-response so

that our weighted sample closely matched the 18-49 years old Slovenian population in the Central Population Registry with respect to distribution of characteristics such as sex, age, and region, and size and type of settlement. To minimize reporting bias, we used computer-assisted self-interviewing for more sensitive questions. It has been shown that respondents are more willing to reveal socially censured information in confidentially self-administered questionnaires or video-computer-assisted self-interviewing than in face-to-face settings (19). Limitations of our survey included validity constraints of self-reported information, and possible participation biases inherent to all behavioural surveys.

5 CONCLUSIONS

Our results showed a substantial lifetime burden of STIs in the Slovenian general population, 18-49 years old. They will inform national sexual and reproductive health policies that include STI prevention and control. Seeking appropriate healthcare when having STI symptoms should be encouraged. Access to specialist healthcare by dermatovenerologists when experiencing symptoms suggestive of STIs without an obligatory referral by a general practitioner may contribute to better STI diagnosis and treatment coverage as well as better case management of STIs. Individual counselling for safer sex and support for partner notification should always be integrated. Sexual and reproductive health promotion should also include primary prevention of intimate partner violence against women, including forced sex.

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CONFLICT OF INTEREST

None declared.

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ETHICAL APPROVAL

Medical Ethics Committee of the Ministry of Health of the Republic of Slovenia (No 38/08/16).

AUTHORS CONTRIBUTIONS

IK planned and designed the study, obtained funding, applied for ethics approval, supervised the implementation of the survey, planned and supervised analyses, and drafted and edited the manuscript. MG, MM, DL, and MZ contributed to study design and implementation of the survey. MM, LB, and TK performed statistical analyses. All authors contributed to the interpretation of the results, revised the manuscript, and read and approved the final manuscript.

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