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Clinical settings and specialities notifying cases of bacterial sexually transmitted infections in Switzerland

A cross-sectional study

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Summary

QUESTIONS UNDER STUDY: In the next Swiss National HIV and Sexually Transmitted Infection (STI) Strategy 2011–2017, STI control will be integrated with HIV prevention. Information is needed which will improve the targeting of professional education. The objective of this study was to describe the clinical specialities and settings to which patients with bacterial STI present in Switzerland.

METHODS: We analysed notifications of chlamydia from 01.08.2008–30.11.2008, and of gonorrhoea and syphilis from 01.07.2007–30.11.2008. We recorded patient details, the speciality of the notifying physician and the setting (primary or secondary care).

RESULTS: We included 2150 notifications of chlamydia, 1360 of gonorrhoea and 935 of syphilis. In 12.5% of notifications (556/4445) a speciality or setting could not be assigned. Most chlamydia (1282/2150, 59.6%) and gonorrhoea (902/1360, 66.3%) notifications were from primary care. Slightly more syphilis notifications (429/935, 45.9%) were from secondary than from primary care. General practitioners (GPs) were the single largest group of specialists notifying gonorrhoea (609/1360, 44.8%) and syphilis (223/935, 23.9%) and the second largest speciality notifying chlamydia (446/2150, 20.7%) after gynaecologists in primary care (702/2150, 32.7%). Where male sexual orientation was recorded, 52.5% (180/343) of gonorrhoea cases and 30.3% of syphilis cases in men who have sex with men (50/165) were notified by GPs.

CONCLUSIONS: GPs and other specialists in primary care notify the majority of chlamydia and gonorrhoea and a substantial percentage of syphilis in Switzerland. These physicians will be at the forefront of STI management and secondary prevention to be delivered as part of an integrated HIV and STI strategy.

Key words: *Sexually transmitted infections; disease notification; primary care; case management*

Introduction

Increasing numbers of cases of notifiable bacterial sexually transmitted infections (STI) in Switzerland have been reported since 1999 [1]. In 2009, provisional reports included 6360 notifications of chlamydia, 964 of gonorrhoea and 863 of syphilis [2]. STI are important infections from a public health perspective because they are often asymptomatic but, untreated, can cause severe morbidity including ectopic pregnancy, infertility and late complications of syphilis [3, 4]. STI also facilitate the transmission of HIV infection [5]. A new strategy for HIV and STI in Switzerland (2011 to 2017) is under development; for the first time STI control will be integrated into HIV prevention [6], as it is in some other European countries [7]. Information that helps to target strategies to improve secondary prevention and clinical care is therefore needed.

There is little direct information about patterns of health service use by people in Switzerland who have, or think they might have, an STI [1]. Specialist treatment for STI is provided by dermatovenereologists but the numbers of cases diagnosed is a small fraction of all notifications. Between 1997 and 2003, data from the Swiss Network of Dermatovenereology Polyclinics showed that diagnoses from seven centres in major cities in Switzerland accounted for less than 1% of all notifications of chlamydia, 12% of gonorrhoea [8], and some 15% of syphilis before national surveillance was suspended in 1999 [1].

In Switzerland, laboratories have been required to report diagnosed cases of chlamydia, gonorrhoea and syphilis to the Federal Office of Public Health since 1987 [9]. For syphilis, laboratory notification was reintroduced in 2006

[1]. Since 2006 it has also been obligatory for physicians to notify cases of gonorrhoea and syphilis [1]. These reports are thought to cover the majority of diagnosed cases of notifiable STI in Switzerland. The objectives of this study were to use information about the source of STI notifications to describe the distributions of reports of chlamydia, gonorrhoea and syphilis in Switzerland according to clinical speciality and setting, and to investigate associations between the clinical setting and demographic characteristics.

Material and methods

The study period was 01.07.2007 to 30.11.2008 for gonorrhoea and syphilis, and 01.08.2008 to 30.11.2008 for chlamydia (earlier records were not retained). We used the following data sources: for chlamydia, notification forms of laboratory diagnosed cases (clinical notification is not required); for gonorrhoea and syphilis, laboratory and physicians' notification forms, with physicians' reports as the primary source because these were more detailed. About 40% of syphilis notifications are later confirmed as cases, compared with >90% of gonorrhoea notifications. In this paper we use the term cases to mean laboratory confirmed cases, and notification to mean a report of a possible case, with or without subsequent confirmation. All data were extracted in late 2008 and early 2009 at the Swiss Federal Office of Public Health. Statistical analyses were conducted in 2009 and 2010.

For each notification we extracted information on sex and age and, for syphilis and gonorrhoea, sexual orientation. Other clinical and behavioural variables were too incomplete to be usable. We obtained information on the speciality of the notifying physician and the clinical setting from the stamp on the report form. For laboratory reports of chlamydia, we used information on the doctor or department ordering the test. We matched the name on the stamp against the online directory of the Swiss Medical Association (Verbindung der Schweizer Ärztinnen und Ärzte, FMH (http://www.doctorfmh.ch) to obtain the clinical speciality, workplace, sex and graduation year. If a doctor had more than one specialist title we used the most recent one. Reports from group practices were assigned a speciality if there was enough specific information. No individually identifying information was recorded in datasets, notifications were not linked to individual physicians, and were identified by a unique number only.

We grouped clinical specialities, on the basis of *a priori* decisions about their likely importance in diagnosing or managing patients with STI, as follows: dermatovenereology and infectious diseases (ID, including tropical medicine); general and internal medicine; gynaecology; urology; blood donation; and all other specialities. We then separated these into primary and secondary care settings. Primary care included single-handed or group practices, emergency departments, nursing homes and military clinics. We defined all general and internal medicine specialists working in single-handed or group practices as general practitioners (GP). Secondary care included hospitals, polyclinics, outpatient departments and health resorts. Screening facilities such as blood donation centres and laboratories were classified with secondary care settings. We categorised patient age as: 0–15; 16–19; 20–24; 25–34; 35–44; 45 years and older. Sexual orientation for men was categorised as: heterosexual; homo- or bisexual. Cases amongst women recorded as having a female sex partner were too few for analysis.

For each infection we conducted descriptive analyses. We then used logistic regression models to estimate odds ratios (OR, with 95% confidence intervals, CI), to investigate the probability of patients with each infection being diagnosed in primary care compared with secondary care settings according to age and sex. We assumed that for each infection, all observations were independent. We used Stata version 10 (Stata Corporation, College Station, Austin, TX) for statistical analysis.

Results

During the study periods there were 2150 notifications of chlamydia, 1360 of gonorrhoea and 935 of syphilis infections. In 12.8% of cases (567/4445) overall there was insufficient information to assign a speciality or setting.

Chlamydia cases

Age and sex distribution of laboratory confirmed cases: Of 2150 cases of chlamydia, most were in women (1578/2150, 73.4%) (table 1). Amongst women, the largest numbers of cases were from 20–24-year-olds (570/1578, 36.1%) and 25–34-year-olds (513/1578, 32.5%) and in men, 25–34-year-olds (197/539, 36.5%) followed by 35–44-year-olds (133/539, 24.7%).

Clinical setting and specialities: 1838 cases from 24 clinical specialities were notified. For 312 cases the speciality was unknown and in another 31 cases the speciality was known but could not be allocated to a primary or secondary care setting (total missing 16.0%, 343/2150). Overall, 59.6% (1282/2150) of chlamydia cases were notified from primary care settings and 24.4% (525/2150) from secondary care (table 1). The single largest speciality responsible for notifying chlamydia cases was gynaecology: 51.0%, 1096/2150 of all cases; 54.8%, 702/1282 of primary care cases; and 75.0%, 394/525 of secondary care cases. GPs notified 34.8% (446/1282) of cases from primary care settings. Few chlamydia cases were notified by specialists in dermatovenereology or ID in primary or secondary care settings (57/2150, 2.7%). The majority of these cases were diagnosed in men (53/57, 93.0%) and were distributed evenly between primary and secondary care settings.

Associations with notification from primary care compared with secondary care: Whilst the number of notified chlamydia cases in women was higher in primary than secondary care compared with men, cases in women were less likely to have been notified from primary than from secondary care settings (age-adjusted OR 0.56, 95% CI 0.44 to 0.71).

Gonorrhoea

Age, sex and sexual orientation of notifications: Of 1360 notifications of gonorrhoea the majority were in men (1101/1360, 81.0%) (table 2). Amongst men, the largest

numbers of notifications were from 25–34-year-olds (366/1101, 33.2%) and 35–44-year-olds (331/1101, 30.1%) and in women, 25–34 year olds (81/241, 33.6%) followed by 20–24 year olds (59/241, 24.5%). Sexual orientation was reported for 81.0% (892/1101) of male notifications; 38.5% (343/892) of those with known orientation were men who have sex with men (MSM).

Clinical setting and specialities: There were 1265 gonorrhoea notifications from 37 settings. For 95 notifications (7.0%) the speciality was unknown and for an additional one the speciality was known but could not be allocated to primary or secondary care. Overall, 66.3% (902/1360) of gonorrhoea notifications were made from primary care settings and 26.6% (362/1360) from secondary care (table 2). GPs were the single largest speciality responsible for gonorrhoea notifications: 44.8% (609/1360) of all notifications; and 67.5% (609/902) of those from primary care. Specialists in dermatovenereology and ID made 12.6% of gonorrhoea notifications (172/1360) from primary and secondary care settings combined. GPs accounted for 50.7% (558/1101) of all notifications in men. Amongst women, 17.4% of notifications (42/241) were from GPs, compared with 31.1% (75/241) by gynaecologists working in primary care and 33.6% of gynaecologists (81/241) in secondary care settings. Men accounted for over 90% of gonorrhoea notifications from GPs, and from dermatovenereology and ID physicians and urologists in both primary and secondary care.

GPs notified approximately half of all gonorrhoea in both MSM (180/343, 52.5%) and heterosexual men (296/549, 53.1%) ($p = 0.675$). Specialists in dermatovenereology and ID were responsible for 20.7% of notifications from MSM (71/343) compared with 10.7% of notifications (59/549) from heterosexual men ($p < 0.001$).

Associations with notification from primary care compared with secondary care: Gonorrhoea notifications in women were less likely to have come from primary than secondary care settings than in men (age-adjusted OR 0.50, 0.37, 0.66). Notifications in older patients were more likely to have been made from primary than from secondary care settings (likelihood ratio test $p = 0.050$).

Table 1: Notified chlamydia cases in women and men 01.08.2008–30.11.2008, by setting and speciality (N = 2150).

Setting, speciality	Women n (%)	Men n (%)	Missing n (%)	Total n (%)
Primary care				
GP	202 (12.8)	232 (43.0)	12 (36.4)	446 (20.7)
Gynaecology	693 (43.9)	6 (1.1)	3 (9.1)	702 (32.7)
Dermatovenereology/ID	2 (0.1)	25 (4.6)	0 (0.0)	27 (1.3)
Urology	5 (0.3)	58 (10.8)	0 (0.0)	63 (2.9)
Other specialities	15 (1.0)	29 (5.4)	0 (0.0)	44 (2.0)
Sub-total	*917 (58.1)*	*350 (64.9)*	*15 (45.5)*	*1,282 (59.6)*
Secondary care				
Gynaecology	389 (24.7)	2 (0.4)	3 (9.1)	394 (18.3)
Dermatovenereology/ID	2 (0.1)	28 (5.2)	0 (0.0)	30 (1.4)
Urology	0 (0.0)	29 (5.4)	1 (3.0)	30 (1.4)
Other specialities	33 (2.1)	31 (5.8)	7 (21.2)	71 (3.3)
Sub-total	*424 (26.9)*	*90 (16.7)*	*11 (33.3)*	*525 (24.4)*
Missing	237 (15.0)	99 (18.4)	7 (21.2)	343 (16.0)
Total	1,578 (100)	539 (100)	33 (100)	2,150 (100)

GP – general practice (internal medicine and general medicine specialists working in primary care); ID – infectious diseases (including tropical medicine). Column totals might not add up to exactly 100% due to rounding.

Table 2: Notifications of gonorrhoea in women and men 01.01.2007–30.11.2008, by setting and speciality (N = 1360).

Setting, speciality	Women n (%)	Men n (%)	Missing n (%)	Total n (%)
Primary care				
GP	42 (17.4)	558 (50.7)	9 (50.0)	609 (44.8)
Gynaecology	75 (31.1)	4 (0.4)	0 (0.0)	79 (5.8)
Dermatovenereology/ID	5 (2.1)	71 (6.4)	1 (5.6)	77 (5.7)
Urology	1 (0.4)	69 (6.3)	0 (0.0)	70 (5.1)
Other specialities	7 (2.9)	60 (5.4)	0 (0.0)	67 (4.9)
Sub-total	*130 (53.9)*	*762 (69.2)*	*10 (55.6)*	*902 (66.3)*
Secondary care				
Gynaecology	81 (33.6)	4 (0.4)	0 (0.0)	85 (6.2)
Dermatovenereology/ID	6 (2.5)	88 (8.0)	1 (5.6)	95 (7.0)
Urology	1 (0.4)	43 (3.9)	1 (5.6)	45 (3.3)
Other specialities	10 (4.1)	123 (11.2)	4 (22.2)	137 (10.1)
Sub-total	*98 (40.7)*	*258 (23.4)*	*6 (33.4)*	*362 (26.6)*
Missing	13 (5.4)	81 (7.4)	2 (11.1)	96 (7.1)
Total	241 (100)	1,101 (100)	18 (100)	1360 (100)

GP – general practice (internal medicine and general medicine specialists working in primary care); ID – infectious diseases (including tropical medicine). Column totals might not add up to exactly 100% due to rounding.

Syphilis

Age, sex and sexual orientation of notifications: Of 935 notifications of syphilis 71.1% (665/935) were in men and 27.2% (254/935) in women (table 3). The largest numbers of male notifications were in 35-44-year-olds (218/665, 32.8%) and men aged 45 years and over (276/665, 41.5%) and female notifications in 25–34-year-olds (84/254, 33.1%) followed by 35–44 year olds (65/254, 25.6%). Sexual orientation was reported for only 38.0% of male syphilis notifications (253/665). Of those with known orientation, 62.5% (165/253) were MSM.

Clinical setting and specialities: 825 notifications were made from 33 specialities. For 110 notifications the speciality was unknown and in a further seven the speciality was known but could not be allocated to a primary or secondary care setting. Syphilis was as likely to have been notified from primary care (389/935, 41.6%) as from secondary care (429/935, 45.9%) settings (table 3). Specialists in dermatovenereology and ID were the largest group notifying syphilis: 29.0% of all notifications (271/935); 24.4% from primary care (95/389); 41.0% from secondary care (176/429). Within primary care, however, GPs were the largest speciality (223/389, 57.3%). GPs were responsible for 26.8% of syphilis notifications from men (178/665), followed by dermatovenereologists and ID specialists in secondary care (149/665, 22.4%) and other secondary care specialists (128/665, 19.2%). Similar numbers of female syphilis notifications were made by GPs (45/254, 17.7%), secondary care gynaecologists (48/254, 18.9%) and other secondary care specialists (46/254, 18.1%).

GPs notified 30.3% of syphilis in MSM (50/165) and 29.5% (26/88) in heterosexual men (p = 0.900). Specialists in dermatovenereology and ID were responsible for 44.2% of syphilis notifications in MSM (73/165) and for 36.4% (32/88) of those in heterosexual men (p = 0.226).

Associations with notification from primary care compared with secondary care: Women were less likely than men to have been notified from primary than secondary care settings (age-adjusted OR 0.67, 95% CI 0.49 to 0.92).

Discussion

This study of notifications of 4445 bacterial STI reported in 2007 and 2008 has shown that notifications are made by a wide variety of clinical specialists. The majority of cases of chlamydia and gonorrhoea, and a substantial percentage of syphilis cases, were notified from primary care settings. Within primary care settings, GPs were the speciality most likely to notify cases of gonorrhoea and syphilis. Gynaecologists in primary care were most likely to notify cases of chlamydia, followed by GPs. Specialists in dermatovenereology and ID were responsible for a minority of notifications of all bacterial STI. For all three infections, male notifications were relatively more likely than female notifications to be made from primary rather than secondary care settings.

The strengths of this study were that we examined all notifications of bacterial STI across Switzerland and were able to assign a clinical setting (primary or secondary) and a speciality for the majority. These data should therefore be representative of STI notifications for the whole of Switzerland. For syphilis, physicians' notifications include many subsequently unconfirmed cases, and thus they also cover settings where patients present with suspected infections. Limitations of the study design chiefly related to lack of specificity or missing data. Laboratory notifications of chlamydia before August 2008 had not been retained, and hence we examined all records available during the data entry period. Bias is unlikely because there was no observed change in reporting practice over the whole study period, and there were more notifications of chlamydia than gonorrhoea or syphilis, and hence precision was not limited. It is possible that some notifications were not made by the diagnosing physician but by a laboratory or another clinical specialist. We cannot say how many notifications were made by clinical specialists who did not make the diagnosis, but only eight notifications in all came from laboratories. Misclassification in assignment of cases to primary or secondary care was possible either because of missing information or because some locations were difficult to classify. Such misclassification would be non-differential,

Table 3: Notifications of syphilis in women and men 01.07.2007–30.11.2008, by setting and speciality (N = 935).

Setting, speciality	Women n (%)	Men n (%)	Missing n (%)	Total n (%)
Primary care				
GP	45 (17.7)	178 (26.8)	0 (0.0)	223 (23.9)
Gynaecology	32 (12.6)	3 (0.5)	2 (12.5)	37 (4.0)
Dermatovenereology/ID	10 (3.9)	85 (12.8)	0 (0.0)	95 (10.2)
Urology	0 (0.0)	3 (0.5)	0 (0.0)	3 (0.3)
Other specialities	6 (2.4)	25 (3.8)	0 (0.0)	31 (3.3)
Sub-total	*93 (36.6)*	*294 (44.2)*	*2 (12.5)*	*389 (41.6)*
Secondary care				
Gynaecology	48 (18.9)	7 (1.1)	1 (6.3)	56 (6.0)
Dermatovenereology/ID	24 (9.4)	149 (22.4)	3 (18.8)	176 (18.8)
Urology	0 (0.0)	6 (0.9)	0 (0.0)	6 (0.6)
Other specialities	46 (18.1)	128 (19.2)	2 (12.5)	176 (18.8)
Blood donation centres	4 (1.6)	11 (1.7)	0 (0.0)	15 (1.6)
Sub-total	*122 (48.0)*	*301 (45.3)*	*6 (37.5)*	*429 (45.9)*
Missing	39 (15.4)	70 (10.5)	8 (50.0)	117 (12.5)
Total	254 (27.2)	665 (71.1)	16 (1.7)	935 (100.0)

GP – general practice (internal medicine and general medicine specialists working in primary care); ID – infectious diseases (including tropical medicine). Column totals might not add up to exactly 100% due to rounding.

biasing associations towards the null. We were unable to link clinically relevant information to speciality and setting because of the large amount of missing data. There are also some limitations in the analysis. We considered all notifications of each infection as independent observations. This may not be the case if individuals had more than one episode diagnosed during the study period. We believe that this number will be small and will not have affected the overall results.

As far as we know there are no detailed analyses of the numbers of cases and distribution of clinical settings in which bacterial and viral STI in Switzerland are diagnosed and managed. It was of interest that GPs in Switzerland accounted for such high proportions of all bacterial STI, because it is not necessary to have a GP and patients often have direct access to specialists in primary and secondary settings. In countries in which GPs are gatekeepers to secondary care, high proportions of STI diagnoses are made in primary care. In the Netherlands, for example, it has been estimated that three quarters of diagnoses of all STI are made by GPs [10]. A household survey in the United States, where healthcare is also based on private insurance, found that 48.6% (95% CI 43.3, 53.9%) of respondents who reported ever having had an STI had consulted a private physician or a group practice [11], but the proportion of these working as GPs was not reported.

The data used in this study reflect clinical practice in diagnosis and notification and do not necessarily describe the underlying epidemiology of the infections. For example, 73.4% of notified chlamydia cases were in women, whilst 80.2% of gonorrhoea cases were male. There are no representative population-based surveys of the prevalence of any STI in Switzerland, but in the US such studies show similar prevalence rates of gonorrhoea and chlamydia [12] and, in the UK, similar rates of chlamydia [13] in women and men. The small proportion of case notifications of chlamydia from dermatovenereology of ID clinics (2.7%) is notable, given that chlamydia is the most common notifiable STI in Switzerland [2] and the most common cause of male non-gonococcal urethritis [3]. In the UK, chlamydia accounted for 30% (113 585/376 508) of all new STI diagnoses in specialist genitourinary medicine clinics in 2006 [14]. This might reflect ease of access; there are 236 specialist clinics in the UK [14] compared with seven in Switzerland. Gynaecologists and GPs notified the majority of chlamydial infections in Switzerland. Even so, the diagnosed case rate of chlamydia in Switzerland is substantially lower than that in countries in northern Europe that recommend opportunistic testing (data available from authors, on request). Whilst a degree of under-reporting is likely, it is thought that the majority of chlamydia infections in Switzerland remain undiagnosed [15], contributing to ongoing transmission. The clinical settings from which STI were notified also reflect clinical practice, as well as the settings to which patients are most likely to present. Substantial numbers of syphilis notifications were made from a wide variety of clinical specialities in secondary settings; these might have been identified as positive serological tests for syphilis, which might have been performed during diagnostic workups for clinical reasons. Dermatovenereology and ID clinics, the specialities most associated with syphilis, made the same number of notifications as from all other hospital settings combined [4].

The results of this study have implications for clinical practice, public health and research. Although GPs and primary care gynaecologists notify about half of all chlamydia and gonorrhoea cases, the absolute numbers of cases are small and a single practitioner might deal with only one or two people with bacterial STI per year. This study did not provide any information about health-seeking behaviours or clinical management of common viral STI such as genital herpes and genital warts. There are, at present, no clinical guidelines for diagnosis and management of STI in Switzerland, and they might help to improve awareness of STI and consistency of clinical practice. This study suggests that clinical guidelines should be actively communicated to GPs and specialist practitioners in primary care settings. Public health policy in Switzerland will, in future, aim to integrate STI and HIV prevention [7]. This study provides limited data supporting the need for a national strategy. In addition, stronger surveillance systems are needed to monitor trends in numbers and settings of all STI and HIV diagnoses [7]. Research is also needed to support the implementation and evaluation of an integrated HIV and STI strategy. Population-based surveys of the prevalence of both bacterial and viral STI and surveys of STI in HIV-infected individuals will help to determine the burden of disease and the potential for spread, and to evaluate the impact of new interventions. Additional studies on the health-seeking behaviour of both men and women with STI-related problems and physicians' diagnostic and management practices will also help to improve the provision of STI treatment and prevention services. In summary, GPs and other specialists in primary care settings notify the majority of chlamydia and gonorrhoea and a substantial percentage of syphilis cases in Switzerland. These physicians will be in the forefront of STI case management and secondary prevention of STI, to be delivered as part of an integrated HIV and STI strategy.

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