

Prevalence of STI related consultations in general practice: results from the second Dutch National Survey of General Practice

Jan EAM van Bergen, Jan J Kerssens, Francois G Schellevis, Theo G Sandfort, Ton J Coenen and Patrick J Bindels

ABSTRACT

Background

The role of the GP in the care of sexually transmitted infections (STIs) is unclear.

Aim

We studied the prevalence of STI related consultations in Dutch general practice in order to obtain insight into the contribution of the GP in STI control.

Design of study

A descriptive study.

Setting

The study took place within the framework of the second Dutch National Survey of General Practice in 2001, a large nationally representative population-based survey.

Method

During 1 year, data of all patient contacts with the participating GPs were recorded in electronic medical records. Contacts for the same health problem were clustered into disease episodes and their diagnosis coded according to the International Classification of Primary Care. All STI and STI related episodes were analysed.

Results

In total, 1 524 470 contacts of 375 899 registered persons in 104 practices were registered during 1 year and 2460 STI related episodes were found. The prevalence rate of STI was 39 per 10 000 persons and of STI/HIV related questions 23 per 10 000. More than half of all STIs were found in highly urbanised areas and STIs were overrepresented in deprived areas. Three quarters of all STIs diagnosed in the Netherlands are made in general practice. An important number of other reproductive health visits in general practice offer opportunities for meaningful STI counselling and tailored prevention.

Discussion

GPs contribute significantly to STI control, see the majority of patients with STI related symptoms and questions and are an important player in STI care. In particular, GPs in urban areas and inner-city practices should be targeted for accelerated sexual health programmes.

Keywords

prevalence; primary care; sexually transmitted diseases, sexually transmitted infections.

INTRODUCTION

Since the end of the 1990s, the number of sexually transmitted infections (STIs) is increasing in the Netherlands, as well as in other European countries.^{1,2} However, these data are based on surveillance data from STI-clinics and do not reflect the disease burden on population level.³ The number, distribution, and accessibility of STI-clinics is different in different European countries, and patients with STI related problems can visit other healthcare providers as well.

In the Netherlands, the range of STI care providers is predominantly limited to STI clinics, municipal public health services and GPs. In the four largest cities, there are six STI clinics that offer free and anonymous care. There are 37 municipal public health services. Some have treatment facilities for STIs and other collaborate with STI clinics or dermatovenerological departments. In 2001, the total number of new consultations in STI-clinics and municipal health service (MHS) facilities

JEAM van Bergen, MD, PhD, GP and project manager STI AIDS Netherlands, Amsterdam; department of general practice, Academic Medical Centre-University of Amsterdam, The Netherlands. JJ Kerssens; PhD, epidemiologist; FG Schellevis, PhD, epidemiologist, NIVEL (Netherlands Institute for Health Services Research), Utrecht, The Netherlands. TG Sandfort, PhD, psychologist, HIV Centre for Clinical and Behavioral Studies, New York State Psychiatric Institute and Columbia University, New York. TJ Coenen, MSc, director, STI AIDS Netherlands, Amsterdam, The Netherlands. PJ Bindels, MD, PhD, professor of general practice, department of general practice, Academic Medical Centre-University of Amsterdam, The Netherlands.

Address for correspondence

Jan van Bergen, STI AIDS The Netherlands, Keizersgracht 390 1016GD Amsterdam, The Netherlands.
E-mail: jvanbergen@soaaid.nl

Submitted: 3 May 2005; **Editor's response:** 15 July 2005; **final acceptance:** 9 September 2005.

©British Journal of General Practice 2006; 56: 104–109.

was 38 117.⁴ Of these, the Amsterdam STI clinic was the most frequently visited with almost half ($n = 17\,981$) of the total number of new consultations.⁵

The Dutch GP is the core primary care provider and gatekeeper of the healthcare system: almost 96% of all health complaints are dealt with in general practice.⁶ Little is known about the role of GPs in STI care in the Netherlands. It is assumed that GPs play an important part in STI care, but no recent data are available.⁷ Information on how many people actually visit their GP for STI related problems is needed to provide insight into the role of primary care in STI care, to be able to estimate the population burden of STI disease and to guide health policy planners.⁸

We wanted to assess the contribution of GPs in STI control. To determine the prevalence of STI and STI related consultations in general practice, data from the second Dutch National Survey of General Practice were used.⁹ This large survey contains a representative sample of the Dutch population and general practices. We compared these data with available surveillance data from STI clinics.

METHOD

Dutch National Survey of General Practice

The study described here took place within the framework of the second Dutch National Survey of General Practice carried out by NIVEL (National Institute for Research in Primary Care), in 2001 in cooperation with the National Information Network of General Practice. The first national survey was conducted in 1987. The aim of these large National Surveys was to obtain information on the role and position of general practice in Dutch health care.^{9,10} In this second National Survey data were collected about health and healthcare related behaviour of 375 899 persons, registered in 104 practices with 195 GPs. Population, practices and GPs were representative for the Dutch population, with a slight under representation of single-handed GPs. Study design, methods and response will be summarised here and have been published elsewhere in more detail.⁹

How this fits in

Prevalence of STI-related consultations in primary care is unknown. This research demonstrates that GPs cover approximately two-thirds of all STI related consultations and three-quarters of all STI diagnosis in the Netherlands.

Sexually transmitted infections

During a 1-year period, data about all patient contacts, including information on diagnoses, referrals and prescriptions, were registered by participating GPs in electronic medical records. Diagnoses were coded according to the ICPC (International Classification of Primary Care).

Consultations dealing with the same health problem were grouped into disease episodes. The disease episode was coded with the diagnosis made in the chronologically last contact. For example, a patient diagnosed and treated with urethral discharge at his first contact (ICPC code Y03) could return 1 week later for microbiological results showing a gonococcal infection (ICPC code Y71). The episode diagnoses would be then Y71.

A patient 'worried about HIV' (ICPC code B90) with a negative test at follow up would remain diagnosed as an B90 episode.

Prevalence was defined as the number of persons with one or more episodes during that year (1-year period prevalence).

The database was searched for relevant ICPC codes for STIs. Some STIs do not have a unique ICPC-code. Chlamydial infection in men is coded as 'other male genital diseases' (Y99). Searching on Y99 would yield also non-STI related 'other male genital diseases' like torsion of the testis or spermatocele.

In order to make the category 'other male genital diseases' (Y99) relevant for our study objective, we linked it with prescription data and only retrieved those Y99 episodes for which specific STI-medication, according to the guideline in 2001, was given (azithromycine [1 g]; doxycycline [200 mg] for 7 days; and/or ciprofloxacin [500 mg]). The cluster 'urethritis in man' was defined as all those men who had either an episode of gonorrhoea (Y71), penile discharge (Y03), urethritis not specific (U72) or 'other male genital diseases' for which STI-medication was given (Y99 with medication). Also epididymitis (Y74), at a young age, often a complication of STI, was restricted to those episodes for which STI-medication was given.

For women, a non-specific ICPC code for chlamydial infection exists. The GP can either categorise a chlamydial infection in females under sub-codes: cervicitis (X84), vaginitis (X85) or 'other female genital diseases' (X99). We defined the cluster 'cervico-vaginitis' as all women who had an episode of either gonorrhoea (X71), cervicitis (X84) for which specific STI-medication was given, vaginitis (X85) for which STI-medication was given, or 'other genital diseases' (X99) for which STI-medication was given.

Pelvic inflammatory disease, a complication of STI in women, has a unique ICPC-code (X74).

Table 1. Prevalence of STI and STI-related episodes in general practice.

STI and STI-related episodes	ICPC-code	Number of episodes	Prevalence per 100 000 persons	Number of episodes per year per GP	Total national number of episodes
Genital herpes	X90/Y72	181	45	1.1	7178
Genital warts	X91/Y76	258	64	1.5	10 232
Trichomoniasis	X73	101	25	0.6	4006
Syphilis	X70/Y70	6	1.5	0	238
HIV	B90	50	13	0.3	1983
Men – Urethritis		429	107	2.5	17 010
Penile discharge	Y03	93	23	0.5	3684
Gonorrhoea	Y71	71	18	0.4	2816
Non-specific urethritis	U72	164	41	1.0	6504
Other genital diseases AND STI medication ^a	Y99+R/	101	25	0.6	4006
Women – Cervico-vaginitis		189	47	1.1	7504
Gonorrhoea	X71	27	7	0.2	1071
Cervicitis AND STI medication ^a	X85+R/	71	18	0.4	2816
Vaginitis AND STI medication ^a	X84+R/	40	10	0.2	1594
Other genital diseases AND STI medication ^a	X99+R/	51	13	0.3	2023
Pelvic inflammatory disease	X74	200	50	1.2	7932
Epididymitis AND STI medication ^a	Y74 +R/	139	35	0.8	5513
STI Diagnoses subtotal		1553	388	9.1	61595
Questions/worried STI	X23/Y25	721	180	4.2	28595
Questions/worried HIV-AIDS	B25	186	46	1.1	7377
Questions subtotal		907	226	5.3	35971
Total STI-related episodes		2460	614	14.4	97567

^aBecause chlamydia is a sub-code within the ICPC head-code Y99 only those episodes are considered if STI medication is also prescribed (see Method).

+R/ = azithromycine [1 g], ciprofloxacin [500 mg] and/or doxycycline [100 mg] bid for 7 days. ICPC = International Classification of Primary Care. STI = sexually transmitted infection.

Non-STI related reproductive health episodes, including contraceptive encounters, were inventorised to quantify potential prevention opportunities for tailored counselling.

Analysis

For the present analysis all STI related disease episodes were extracted from the database together with demographic information of the practices. Urban–rural classification of the practice was related to the Area Address Density according to Statistics Netherlands (www.cbs.nl): very highly urban (>2500 addresses/km²); highly urban (1500–2500 addresses/km²); moderate urban (500–1500 addresses/km²) and rural (<500 addresses/km²).

Deprived areas were defined according to existing health insurance categories, and related to low income and multiethnic neighbourhoods. According to these categories 5% of the Netherlands population lives in a deprived area.

As some people moved in or out the GP practices during the year studied we used the mid-time population as the denominator.

For extrapolation to the national level and GP practice level the 2001 population data of Statistics Netherlands (www.cbs.nl) were used (15.9 million inhabitants and a mean of 2350 persons registered in a Dutch general practice).

For comparisons with persons seen at STI clinics and MHS facilities, surveillance data from 2001 were used.

RESULTS

The total study-population consisted of 375 899 persons. These persons had 1 524 470 consultations with their GPs in 949 220 disease episodes. Overall, 2 143 558 prescriptions were recorded in these 12 months.

In total 2460 STI related disease episodes were found and in 1553 persons a STI diagnosis was made (388/100 000). Urethritis in men (107/100 000) and STI related cervico-vaginitis in women (47/100 000) were recorded most frequently, followed by genital warts (64/100 000) and genital herpes (45/100 000). In total 907 persons were worried about STI or HIV

Table 2. Prevalence of selected reproductive health related episodes in general practice.

Reproductive health related episodes	ICPC-code	Number of episodes	Prevalence per 100 000 persons	Number of episodes per year per GP	Total national number of episodes
Vaginitis, no STI medication	X84-R/	2064	515	12.1	81 849
Cervicitis, no STI medication	X85-R/	147	37	0.9	5830
Other genital diseases, no STI medication					
Male	Y99-R/	216	54	1.3	8566
Female	X99-R/	457	114	2.7	18 124
Vaginal discharge	X14	2233	557	13.1	88 560
Candidiasis	X72/Y75	4758	1187	28	188 700
Subtotal		9875	2627	62	417 701
Ectopic pregnancy	W80	42	11	0.2	1150
Sub/-infertility	W15	766	191	4.5	30 379
Morning after contraception	W10	995	248	5.8	39 461
Oral contraceptives	W11	22587	5634	132	895 791
New starters		4091	Incidence: 1020	New starters: 24	162 247
IUD	W12	1440	359	8.5	57 110
New starters		853	Incidence: 213	New starters: 5.0	33 830
Total selected reproductive health related episodes		35705	9070	213	1 442 108

IUD = intrauterine device. STI = sexually transmitted infection.

(226/100 000), but no other STI diagnosis was made (Table 1).

Table 2 indicates that disease episodes related to other, non-STI related, reproductive health issues in general practice are much more frequent (35 705 versus 2460 episodes).

For every STI, more than half of the STI-episodes were diagnosed in general practices in high and very high urban areas (Table 3). GPs in very high urban areas see on average three times more STI related episodes compared with their colleagues in rural areas. In general practices in deprived areas two

times more disease episodes for STI are encountered than might be expected: well over 10% of the total number of STI episodes take place in general practices in these areas. For persons with HIV-infections this is one-third (37%; Table 3).

Comparison with STI/MHS figures and extrapolations

In 2001 STI/MHS-clinics recorded 38 117 first STI consultations with a total of 10 139 STI diagnoses.^{4,5,11,12} The number of chlamydial infections, gonococcal infections, (early) syphilis, genital warts, genital herpes

Table 3. Percent and total number of selected STI episodes in general practice according to level of urbanisation and deprived area score.

	Urethritis (%)	Cervico-vaginitis (%)	Genital herpes (%)	Genital warts (%)	PID (%)	Trichomoniasis (%)	HIV (%)	Normal distribution in the Netherlands (%)
Urbanisation: ^a								
Very high	31	37	21	31	28	27	63	18
High	27	25	38	30	20	33	16	23
Moderate	16	17	16	15	20	20	9	18
Low urban	16	14	15	15	1	11	6	20
Rural	10	7	10	9	15	9	6	21
Total	100 (n = 429)	100 (n = 189)	100 (n = 181)	100 (n = 258)	100 (n = 200)	100 (n = 90)	100 (n = 50)	100 (n = 15.9 million)
Deprived area:								
Yes	11	16	10	12	8	16	37	5
No	89	84	90	88	92	84	63	95

^aAccording to area address density: 1) very high urban (>2500 addresses/km²); 2) high urban (1500–2500 addresses/km²); 3) moderate urban (1000–1500 addresses/km²); 4) low urban (500–1000 addresses/km²); and 5) rural (<500 addresses/km²). PID = pelvic inflammatory disease.

and urethritis (non-chlamydial and non-gonococcal) in 2001 was 3609, 1610, 308, 1479, 730 and 2253, respectively. One hundred and thirty-two HIV-infections were diagnosed.

Extrapolating data from the second Dutch Survey to the entire country suggests that annually over 97 000 persons with one (or more) STI related episode are seen in general practice: more than 61 000 with a diagnosis of an STI and almost 36 000 with questions and worries about STI or HIV (Table 1). Adding the number of consultations at STI/MHS-clinics, and assuming that approximately 10% of persons with STI related symptoms visit another provider for STI care (such as a reproductive health clinic or gynaecologist),¹³ it means that in total approximately 150 000 persons seek STI care annually in the Netherlands. In general practice 65% (97 000/150 000) of all STI related consultations take place. Comparing the number of major STI diagnoses, assuming also that 10% of diagnoses are made by other providers, 78% (61 595/78 907) of all STI diagnoses are made in general practice.

DISCUSSION

Summary of main findings

This general practice based nationwide study provides representative information about the number of STI related consultations in general practice in the Netherlands. A 1-year period prevalence of STIs was 38 per 10 000 persons and 23/10 000 for STI/HIV related questions. We calculated that two-thirds of all STI related consultations and more than three-quarters of all STI diagnoses in the Netherlands were made in general practice. More than half of all STI related diagnoses were made in practices in high urban areas.

There is marked heterogeneity in the STI diagnoses made in general practice compared to STI clinics. Syphilis and HIV diagnoses are much more concentrated within STI clinics and STI related syndromes like urethritis and cervicitis are more prevalent in general practice. This reflects the different epidemiological profiles of STI.¹⁴ Chlamydial infections are more dispersed throughout the country and less attached to specific risk categories.¹⁵ STI clinics attract a selected, more at-risk population, such as men who have sex with men and clients or workers in prostitution.^{14,16}

Strengths and limitations of the study

Our data demonstrate that indeed the GP contributes significantly to STI-control. We assume that our figures represent the lower limit. For instance, we did not include hepatitis B or *Pediculus*

pubis. Also, re-infections during 1 year in the same person were not considered. The number of reproductive health related episodes is >10-fold higher than the number of STI related episodes. Some of these reproductive health related episodes can still be STI related, but were neither labelled nor detected as such. Reproductive health related episodes may also have been used by the GP for STI counselling.

A limitation of our study is the fact that our findings depend heavily on the quality of the registration by the GPs and the validity of our clustering into STI-episodes. Participating GPs were experienced in working with electronic medical records and with ICPC and did not differ significantly in diagnosing disease episodes from other GPs.¹⁰ Inter-doctor variation in ICPC coding of participating GPs in an audit using paper 'vignettes' was small and the level of agreement with external ICPC experts was on average 81%.¹⁰

The use of ICPC codes in analysing STI related consultations also needs caution. For instance episodes coded as gonorrhoea (Y71), will certainly not yield all cases, as a significant proportion of GPs did not request (concordant with the guidelines at that time) microbiological confirmation of a male urethritis/discharge syndrome. Owing to this potential source of misclassification and in order to obtain a meaningful outcome we composed a cluster definition, using specific STI prescription data as well.

Comparison with existing literature

We compared our findings with a sentinel surveillance system (Continuous Morbidity Registration).¹⁷ This network is also GP based and covers a 1% representative sample of Dutch GPs and of the Dutch population. It reports weekly about selected health issues and holds records on urethritis and HIV related questions in general practice. The average number of consultations for urethritis in 2001 in this surveillance system was exactly the same as our cluster estimate. The number of consultations related to 'questions and/or worries about HIV-AIDS' in the sentinel surveillance system was 20 per 10 000, closely matching with our estimate of 23 per 10 000 (B25, X23, Y25). These quality checks support our impression that data derived in our manner from the database of the National Study are sufficiently robust to make comparisons.

In previous research we found that 1.2% of 9687 interviewees in a representative population sample aged >18 years reported symptoms in the past year, which they thought were suggestive of an STI (5% among 18–24 year olds).¹³ In total, 63% reported to have visited a GP for this, 20% a STI/MHS clinic, 8% another healthcare provider

and 9% did not seek help for their symptoms.¹³ Extrapolating those data would mean that approximately 90 000 would have visited a GP for this reason and 30 000 a STI clinic or MHS facility. This closely mirrors the actual data we found in this study. The slight underestimation might be due to the fact that the questionnaire study was restricted to 18 years and older, and the questionnaire referred to healthcare seeking behaviour among those who 'had any signs, symptoms or complaints in the past year of which you thought were suggestive for STI'.

Implications for future research or clinical practice

Our study renders support to the statement that sentinel surveillance in primary care as well as the use of data routinely registered primarily for care purposes are valuable and much less costly tools for monitoring compared to large population-based research. Accelerated access to electronic databases creates opportunities to analyse regional and local data. These might differ substantially within and between regions and cities due to different epidemiological profiles, but also due to a doctor or practice professional variation. As 90% of Dutch GPs have a computerised practice, practice data can be used in the near future for sentinel surveillance and also as a tool for quality assurance. Laboratory databases can also contribute to measure diagnostic activity in primary care if denominator data are available and can be disaggregated from other clinical and public health settings.¹⁸

Another important observation is the fact that GPs have reproductive health related consultations on a daily basis and have, on average, two new starters on oral contraceptives every month. These encounters provide avenues for tailored prevention advice and problem-oriented counselling for safer sex. Active case finding of chlamydial infection in youngsters is another contribution of the GP in STI-control. These additional tasks in primary and secondary prevention are now incorporated in the recently revised Dutch GP guideline on STI care.¹⁹ As GPs in urban and deprived areas see comparatively more STIs they should especially be targeted for continuous education programmes.

In conclusion, the GP is an important player in STI control in the Netherlands and cover two-thirds of all STI related consultations and 78% of all STIs diagnoses. Many sexual and reproductive health encounters in primary care incorporate opportunities for counselling on safer sex. Appropriate attention for sexual health in general practice is required.

Funding body

Ministry of Health, The Hague, Netherlands and GlaxoSmithKline

Ethics committee

The study was conducted according to the Dutch legislation on data protection (Ministry of Justice, the Netherlands)

Competing interests

The authors have stated that there are none

Acknowledgements

Thanks to Kees Bolt for critical analysis of the preliminary data.

REFERENCES

1. Van de Laar MJW, Op de Coul ELM. *HIV and sexually transmitted infections in the Netherlands in 2003*. RIVM report 441100020/2004. Bilthoven, The Netherlands: RIVM, 2004.
2. Nicoll A, Hamers FF. Are trends in HIV, gonorrhoea and syphilis worsening in Western Europe? *BMJ* 2002; **324**: 1324–1327.
3. Howards PP. Do clinic based STD data reflect community patterns? *Int J STD AIDS* 2002; **13**: 11.
4. Fennema H. *Annual report 2001*. Amsterdam: SOA polikliniek GGD, 2002.
5. Van de Laar M, Haks K, Coenen T. Again strong increase of STI in 2001. *STI Bulletin* 2002; **23**: 14–16.
6. Cardol M, van Dijk L, de Jong JD, et al. *General practice: what does the gatekeeper? Second Dutch National Survey of General Practice*. Utrecht, The Netherlands: Nivel/RIVM, 2004.
7. Coenen AJ, Berends R, Van der Meijden WI. The organisation of STI control in the Netherlands — an overview. *Int J STD AIDS* 2002; **13**(4): 254–260.
8. Simms I, Hurtig AK, Rogers PA, et al. Surveillance of sexually transmitted infections in primary care. *Sex Transm Infect* 2003; **79**: 174–176.
9. Westert GP, Schellevis FG, de Bakker DH, et al. Monitoring health inequalities through general practice: The second Dutch National Survey of General Practice. *Eur J Public Health* 2005; **15**: 59–65.
10. Van der Linden MW, Wester GP, de Bakker DH, Schellevis F. *Health complaints and diseases in the population and in general practice. Second Dutch National Survey of General Practice* [Tweede Nationale Studie naar ziekten en verrichtingen in de huisartspraktijk: klachten en aandoeningen in de bevolking en in de huisartspraktijk]. Utrecht, The Netherlands: NIVEL, 2004.
11. Van de Laar MJW, Haks K, Coenen AJ. *Registration of STD and HIV consultations at the MHS and STI clinics*. RIVM report 441500014/2002. Bilthoven, The Netherlands: RIVM 2002.
12. Cairo I. Consultations and diagnoses at the STI clinics 1991–2001 (Dutch). *STI Bulletin* 2002; **23**: 18–22.
13. Van Bergen JEAM, Kerssens J, Schellevis F, et al. STI and STI health care seeking behaviour in the Netherlands: GP attends to the majority of STI consultations [abstract]. WONCA, Amsterdam, The Netherlands, 1–4 June 2004.
14. Van de Laar MJW, Op de Coul ELM. *HIV and sexually transmitted infections in the Netherlands in 2003. An update: November 2004*. RIVM report 441100020/2004. Bilthoven, The Netherlands: RIVM, 2004.
15. Van Duynhoven YT, van de Laar MJ, Schop WA, et al. Different demographic and sexual correlates for chlamydial infection and gonorrhoea in Rotterdam. *Int J Epidemiol* 1997; **26**(6): 1373–1385.
16. Fennema JSA, Cairo I, Spaargaren J, et al. Syphilis epidemic and rise of HIV infections among homosexual men at an Amsterdam venereal disease clinic [Dutch]. *Ned Tijdschr Geneesk* 2002; **16**(13): 633–635.
17. Bartelds AIM. *Continue Morbiditeits Registratie Peilstations Nederland 2001* [Continuous morbidity registration by sentinel surveillance network in the Netherlands]. Utrecht, The Netherlands: NIVEL, 2002.
18. Slater W, Low N. Surveillance of sexually transmitted infections in primary care. *Sex Transm Infect* 2004; **80**: 152.
19. Van Lieshout J, Mastboom MT, van Bergen JE, Pijnenborg I, Goudswaard AN. Summary of the practice guideline 'The STD consultation' from the Dutch College of General Practitioners [Dutch]. *Ned Tijdschr Geneesk* 2005; **149**(32): 1778–1784.