

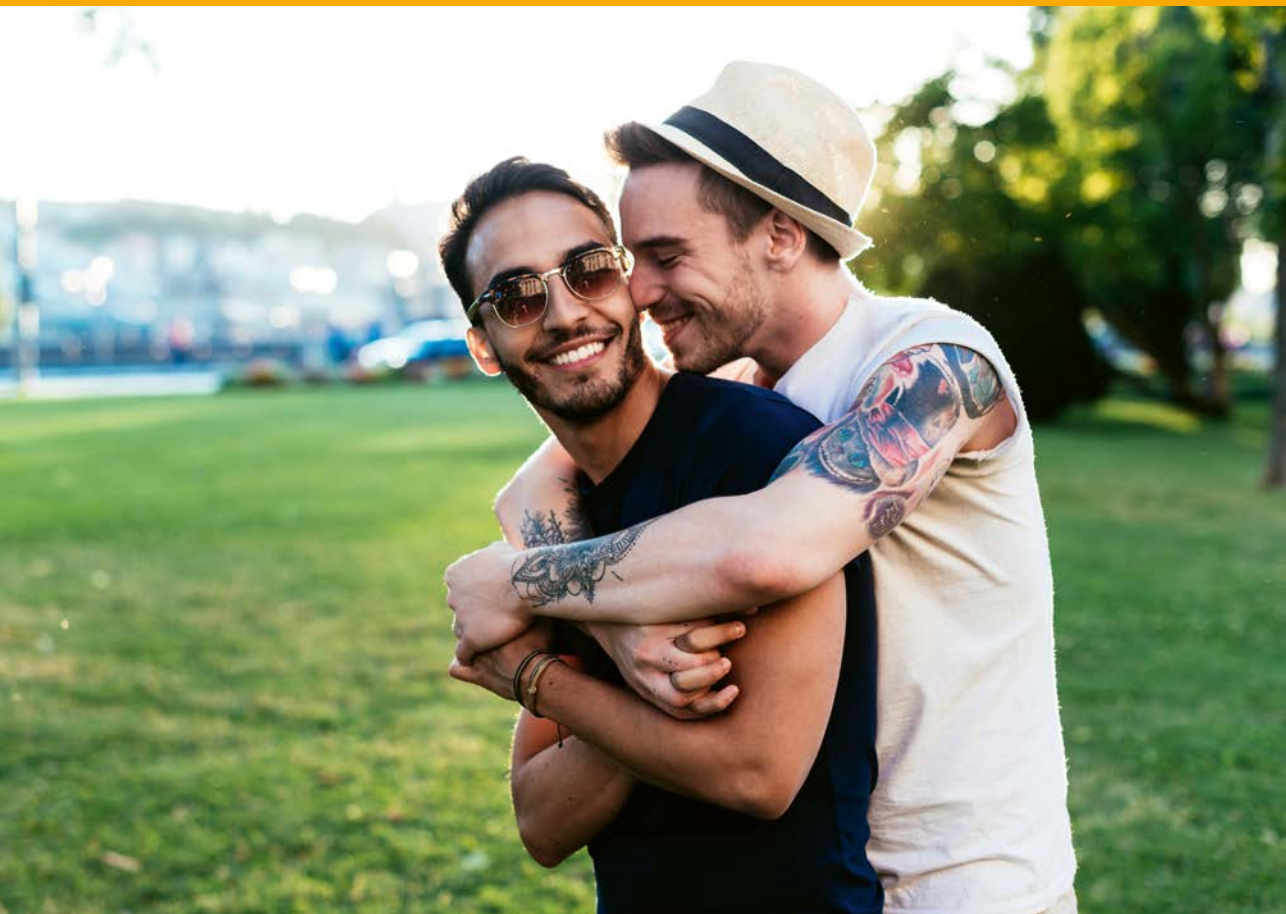


National Institute for Public Health
and the Environment
Ministry of Health, Welfare and Sport

Sexually transmitted *infections*

in the Netherlands in 2018

*This report contains an erratum
d.d. 14-06-2019 on page 128a*



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Colophon

RIVM report number: 2019-0007

DOI 10.21945/RIVM-2019-0007

Report prepared by:

Centre for Infectious Disease Control, National Institute for Public Health and the Environment

In collaboration with:

Sexual Health Centres

HIV Monitoring Foundation and HIV treatment centres

OSIRIS

A publication by the

National Institute for Public Health and the Environment, RIVM

P.O. Box 1

3720 BA Bilthoven

The Netherlands

www.rivm.nl

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ISBN 978-90-6960-293-6

Synopsis

Sexually transmitted infections in the Netherlands in 2018

In 2018, the number of people tested at a Sexual Health Centre (SHC) for a sexually transmitted infection (STI) remained almost the same as in 2017, as did the percentage with an STI. Chlamydia is the most common STI among heterosexuals. Among men who have sex with men (MSM), gonorrhoea was the most frequently diagnosed infection. The number of STI-related consultations with general practitioners (GPs) increased, mainly among people aged over 25.

The SHC offer complimentary STI testing to people with a high risk of an STI, for example those aged under 25. A total of 152,217 consultations at SHC were recorded in 2018. The number of consultations among women and heterosexual men declined, whereas an increase was noted among MSM. STIs were detected in 18.2 percent of the consultations, the same as in 2017. Infections were most often found in people who had been notified for STI, followed by those with HIV. In addition to the SHC data, this report includes information about STIs from 367 general practices in 2017, on the basis of which estimates have been made for the Dutch population. GPs perform most of STI-related consultations and diagnoses.

Chlamydia

In 2018, 13.9 percent (20,021 cases) of SHC visitors were diagnosed with chlamydia, a 2 percent decline compared to 2017. The percentage of women and heterosexual men with chlamydia remained stable between 2016-2018 (15 percent and 18 percent respectively) after a steady increase in the two previous years. For MSM, the percentage has remained stable at 10 percent for many years. The number of GP diagnoses increased in both men and women in 2017 compared to 2016.

Gonorrhoea

The number of gonorrhoea diagnoses made at SHC increased by 9 percent in 2018 to 7,362 infections. The percentage of people infected remained stable: it was low among women (1.7 percent) and heterosexual men (2.0 percent), and higher among MSM (11.2 percent). The estimated number of infections diagnosed by GPs increased from 9,000 in 2016 to 9,550 in 2017. This increase was mainly found in women aged above 25. At SHC, none of those infected showed resistance to the current 'first-choice' antibiotic, ceftriaxone, however there was resistance to other antibiotics. Resistance to azithromycin has continued to increase: from 2 percent in 2012 to 11 percent in 2018.

Syphilis

In 2018, there was no change in the number of syphilis diagnoses at SHC compared with 2017; 1,224 versus 1,228 respectively. Of these infections, 96 percent were diagnosed among MSM. After many years of increasing, the percentage of MSM with the infection has declined slowly; from 2.9 percent in 2016, to 2.6 percent in 2017, and 2.4 percent in 2018. This change is mainly due to a lower percentage of syphilis found among MSM with HIV. The number of diagnoses among women and heterosexual men remained very low in 2018, with diagnoses among 0.1 and 0.2 percent respectively among those tested.

HIV

The number of new diagnoses of HIV made at the SHC in 2018 (249) was lower than in 2017 and 2016, 286 and 285 respectively. Of these, 90 percent were among MSM. The number of diagnoses among women and heterosexual men remained very low. In 2018, 909 people with HIV were treated at Dutch HIV treatment centres ('in care') for the first time; less than in 2017 (1,037). In total, 20,181 people with HIV were registered in care in 2018.

Key words: STI, chlamydia, gonorrhoea, syphilis, HIV, AIDS, antibiotic resistance, young people, MSM, monitoring, sexual health centre.

Publiekssamenvatting

Seksueel overdraagbare aandoeningen in Nederland in 2018

In 2018 hebben vrijwel evenveel mensen zich bij een Centrum voor Seksuele Gezondheid (CSG) laten testen op seksueel overdraagbare aandoeningen (soa) als in 2017. Het percentage dat daadwerkelijk een soa had bleef gelijk. Chlamydia bleef de meest voorkomende soa onder heteroseksuelen. Bij mannen die seks hebben met mannen (MSM) was gonorrhoe de meest voorkomende soa. Bij huisartspraktijken nam het aantal soa-consulten toe, voornamelijk onder personen ouder dan 25 jaar.

Bij CSG's kunnen mensen die een grotere kans hebben een soa op te lopen, bijvoorbeeld jongeren onder de 25, zich gratis laten testen. In totaal zijn er in 2018 152.217 consulten geregistreerd bij de CSG's. Het aantal consulten nam af onder vrouwen en heteroseksuele mannen, maar nam toe bij MSM. Bij 18,2 procent van de consulten werd een soa gevonden. Infecties werden het vaakst gevonden bij mensen die waren gewaarschuwd voor een soa, gevolgd door mensen met hiv. Naast de CSG-cijfers worden schattingen voor de hele bevolking gemaakt op basis van gegevens over soa van 367 huisartspraktijken in 2017. Huisartsen voeren het merendeel van de soa-consulten en diagnoses uit.

Chlamydia

In 2018 had 13,9 procent van de CSG-bezoekers een chlamydia-infectie (2 procent minder dan in 2017; 21.021 diagnoses). Het percentage vrouwen en heteroseksuele mannen met chlamydia bleef in de afgelopen 3 jaar stabiel (respectievelijk 15 procent en 18 procent), na een aanhoudende stijging in de voorgaande jaren. Voor MSM ligt dit percentage al jaren rond de 10 procent. Het aantal geschatte diagnoses door huisartsen was in 2017 stabiel ten opzichte van 2016.

Gonorrhoe

Het aantal gonorrhoe-diagnoses bij de CSG is het afgelopen jaar met 9 procent toegenomen tot 7.362 infecties. De percentages mensen die het bleken te hebben, bleven stabiel ten opzichte van vorige jaren; laag onder vrouwen (1,7 procent) en heteroseksuele mannen (2,0 procent), en hoger onder MSM (11,2 procent). Het geschatte aantal diagnoses door huisartsen nam toe van 9.000 in 2016 naar 9.550 in 2017. Deze toename was vooral onder vrouwen ouder dan 25 jaar. Bij de CSG is geen antibioticaresistentie tegen het huidige 'eerste keus' antibioticum ceftriaxon gemeld. Wel is er resistentie tegen andere antibiotica. De resistentie tegen azitromycine steeg in de afgelopen jaren van 2 procent in 2012 tot 11 procent in 2018.

Syfilis

In 2018 was het aantal syfilis-diagnoses bij de CSG bijna gelijk aan dat in 2017 (1.224 versus 1.228). Daarvan is 96 procent bij MSM vastgesteld. Dit percentage daalde na een jarenlange stijging licht, van 2,9 procent in 2016 naar 2,6 procent in 2017 en 2,4 procent in 2018.

Voornameeljk onder MSM met hiv was het percentage lager. Het percentage vrouwen en heteroseksuele mannen met de infectie bleef in 2018 zeer laag, respectievelijk 0,1 en 0,2 procent.

Hiv

Het aantal nieuwe diagnoses van hiv gesteld bij de CSG's is afgenomen in 2018 (249) ten opzichte van 2017 en 2016 (respectievelijk 286 en 285). Negentig procent van deze diagnoses was bij MSM. Het aantal diagnoses onder vrouwen en heteroseksuele mannen bleef zeer laag. Het aantal mensen met hiv dat in 2018 voor het eerst voor behandeling bij een van de Nederlandse hiv-behandelcentra kwam ('in zorg') was 909, wat minder was dan in 2017 (1.037). In totaal waren in 2018 20.181 mensen met hiv geregistreerd als in zorg.

Kernwoorden: soa, chlamydia, gonorrhoe, syfilis, hiv, aids, antibioticaresistentie, jongeren, MSM, monitoring, centrum seksuele gezondheid.

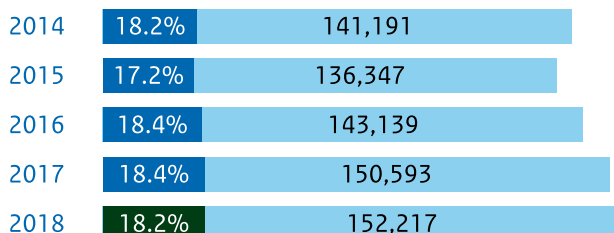
Surveillance of STI in the Netherlands 2018



*SHC: Sexual Health Centres.
Targeted at high-risk groups for STI



Number of SHC consultations*



In 2018:

Women: **16.1%**

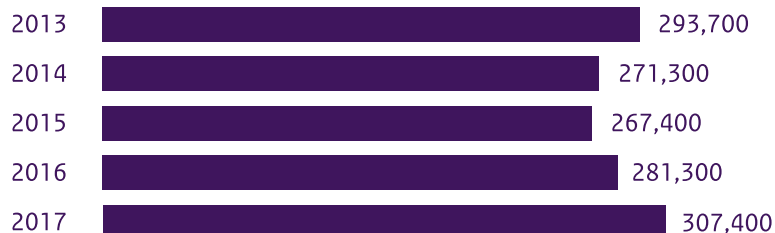
Heterosexual men: **18.9%**

MSM: **20.6%**

Percentage with at least one STI



Number of GP consultations



Chlamydia

SHC: 21,021

GP: 39,800

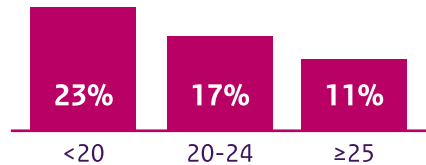
Of diagnoses



Women & Heterosexual men <25 year



% women & heterosexual men with chlamydia decreases with age



% with chlamydia

Women: **15%**

Heterosexual men: **18%**

MSM: **10%**



% among notified attendees: **32%**

LGV among MSM: **278**

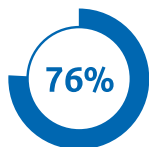
50% HIV-negative

Gonorrhoea

SHC: 7,362

GP: 9,500

Of diagnoses



MSM



% with gonorrhoea

MSM: **11%**

- Known HIV-positive: **18%**

- With symptoms: **22%**

Women and heterosexual men: **1.8%**



% among notified attendees: **29%**



No resistance to ceftriaxone

Syphilis

SHC: 1,224

Of diagnoses



MSM



% with syphilis

MSM: **2.4%**

- Known HIV-positive: **6.6%**

1.9%

2.3%

2.7%

<25

25-39

40+

% with syphilis increases with age

Women and heterosexual men: **0.1%**



% among notified MSM: **11.4%**

HIV

SHC: 249

HIV treatment centres

Of diagnoses



MSM



% with HIV

MSM: 0.5%

- 1st generation non-Western: 1.5%



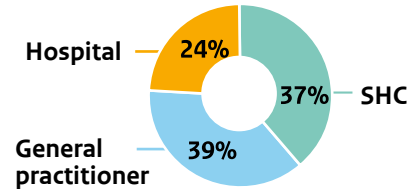
% among notified

MSM: 5.6%

New patients in care: 909

- MSM: 69%

Where are people diagnosed?



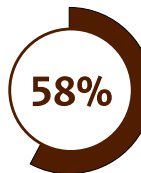
Number of AIDS patients: 88

Genital warts

GP: 41,900

SHC: 1,314

Of diagnoses



men



Genital herpes

GP: 25,800

SHC: 426

Of diagnoses

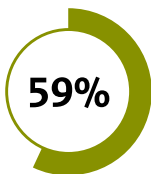


women



Acute hepatitis B

GP, hospital and SHC: 101



Transmission route
Sexual contact



Acute hepatitis C

GP, hospital and SHC: 62



Transmission route
Sexual contact
between men



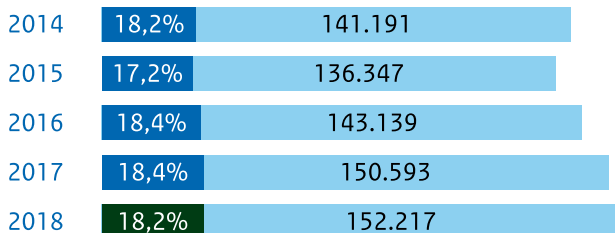
Surveillance van soa Nederland 2018



* CSG: Centra voor Seksuele Gezondheid.
Bedoeld voor groepen die een hoog risico lopen op soa.



Aantal CSG-consulten*



In 2018:

Vrouwen: **16,1%**

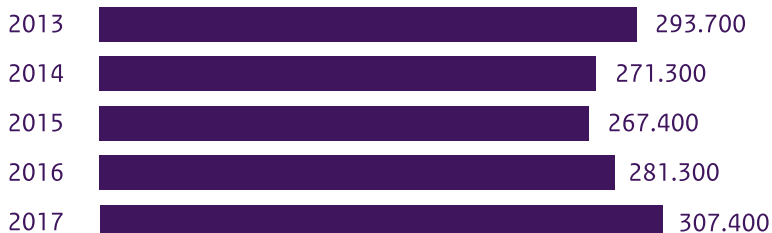
Heteroman: **18,9%**

MSM: **20,6%**

percentage met één of meer soa



Aantal huisartsconsulten



Chlamydia

CSG: 21.021

Huisarts: 39.800

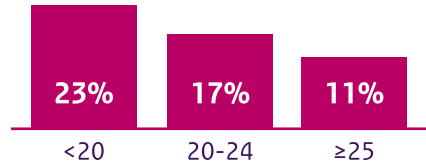
van de diagnoses



**Vrouwen
& Hetero
mannen
<25 jaar**



% vrouwen en heteromannen met chlamydia neemt af met leeftijd



% met chlamydia

Vrouw: **15%**
Heteroman: **18%**
MSM: **10%**



% onder
gewaarschuwde
bezoekers: **32%**

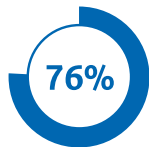
LGV bij MSM: 278
50% hiv-negatief

Gonorrhoe

CSG: 7.362

Huisarts: 9.500

van de diagnoses



MSM



% met gonorrhoe

MSM: **11%**
- Bekend hiv-positief: **18%**
- Met klachten: **22%**

Vrouwen en heteromannen: **1,8%**



% onder gewaarschuwde
bezoekers: **29%**

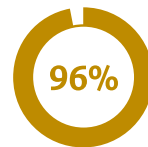


Geen resistentie tegen ceftriaxon

Syfilis

CSG: 1.224

van de diagnoses



MSM



% met syfilis

MSM: **2,4%**
- Bekend hiv-positief: **6,6%**

% met syfilis
neemt toe met
leeftijd

Leeftijd	%
<25	1,9%
25-39	2,3%
40+	2,7%

Vrouwen en heteromannen: **0,1%**



% onder gewaarschuwde
MSM: **11,4%**

Hiv

CSG: **249**

Hiv-behandelcentra

van de diagnoses




MSM



% met hiv

MSM: **0,5%**

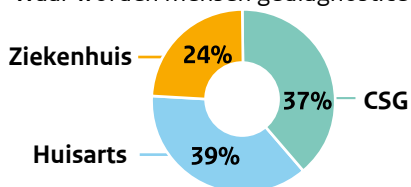
- 1^e generatie niet-Westers: **1,5%**

 % onder gewaarschuwde
MSM: **5,6%**

Patiënten nieuw in zorg: **909**

- MSM: **69%**

Waar worden mensen gediagnosticeerd?

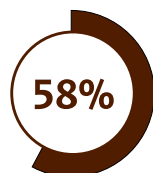


Aantal aids patiënten: **88**

Genitale wratten

Huisarts: **41.900** CSG: **1.314**

van de diagnoses



mannen



Genitale herpes

Huisarts: **25.800** CSG: **426**

van de diagnoses

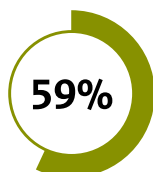


vrouwen



Acute hepatitis B

Huisarts, ziekenhuis en CSG: **101**



Transmissieroute
seksueel contact



Acute hepatitis C

Huisarts, ziekenhuis en CSG: **62**



Transmissieroute
seksueel contact MSM



Preface

This annual report provides an overview of the epidemiology of sexually transmitted infections (STI), including HIV, in the Netherlands in 2018. Data presented are derived from the national STI surveillance database in addition to other data sources registering STI and HIV in the Netherlands, such as the general practitioner, the antenatal screening programme, HIV treatment centres, and notification data.

We present a summary of recent trends ('key points') for each STI, followed by tabulations and figures relating to STI analysed in relation to a range of relevant characteristics. Finally, an overview of the major conclusions and recommendations is given.

We trust that this report will contribute to further awareness of the distribution and causes of STI, including HIV, in the Netherlands, supporting the development and targeting of (preventive) interventions, and enabling assessment of the effectiveness of control activities on STI transmission. The information aims to support policy makers and researchers in the field of STI and related subjects, as well as others interested in STI trends in the Netherlands. More information on STI and HIV trends in the Netherlands is available at www.soahiv.nl and www.hiv-monitoring.nl. A copy of this report can also be downloaded in PDF format from www.rivm.nl/soa.

Acknowledgements

We gratefully acknowledge the cooperation of a large number of physicians, public health doctors and nurses, microbiologists, epidemiologists, dermatologists, behavioural scientists, prevention workers and other professionals working in the field of STI and HIV. We would like to thank the following organisations for their continuing collaboration in data collection and for their support: the Sexual Health Centres (STI clinics and public health services), HIV monitoring Foundation (SHM) and GGD Nederland. We also thank Soa Aids Nederland, Rutgers, HIV association, Netherlands Institute for Health Services Research (Nivel), general practitioners participating in the Nivel Primary Care Database, the Dutch Working Group on Clinical Virology, as well as the other units at the Centre for Infectious Diseases Research, Diagnostics and Laboratory Surveillance (Cib/IDS), and the National Coordination Centre for Communicable Disease Control (Cib/LCI). We especially thank Professor Jan van Bergen (Soa Aids Nederland) and Professor Henry de Vries, who are liaised to the RIVM as external STI experts, and Silke David, policy advisor and programme leader STI, HIV and sexual health at the RIVM. Furthermore, we would like to thank Kitty van der Ploeg and Yvonne Schönbeck from TNO, and Frithjofna Abbink, Kim Vos and Petra Oomen (RIVM) for the data on pregnant women (Praeventis), Mark Nielen, Gé Donker, Rodrigo Davids and Tom Urbanus for Nivel-PCD data and analysis, Maarten Koot and Ed Slot from Sanquin for the blood donor data, and Anouk Urbanus and Annemarie Meiberg for the HBV vaccination programme data. Also, we thank Sofie Mooij and Stijn Raven (Cib/EPI), Kristin Kremer, Daan Notermans and Audrey King (Cib/IDS) and Ellen den Hollander and Marieke Hiemstra (VPZ) for their contributions.

Comments

Please send any comments or suggestions to soahiv@rivm.nl.

Contents

Summary	21
Samenvatting	25
Introduction	29
1 Methodology of STI and HIV surveillance	31
1.1 National surveillance at Sexual Health Centres	31
1.2 Sense	34
1.3 Sexual Health in the Health Survey/Lifestyle Monitor	34
1.4 STI surveillance in general practice	34
1.5 Laboratory surveillance	36
1.6 Antimicrobial resistance of gonococci	36
1.7 Antenatal screening	36
1.8 Congenital syphilis	37
1.9 National registration of patients registered at HIV treatment centres	37
1.10 HIV incidence data	37
1.11 Notification of hepatitis B and C	38
1.12 Hepatitis B vaccination programme for risk groups	38
1.13 Blood donors	38
2 Sexual health, STI and Sense consultations	39
2.1 Key points	39
2.1.1 Sexual Health Centres	39
2.1.2 General practice	40
2.1.3 Health Survey	40
2.1.4 Regional surveillance	40
2.2 Consultations and characteristics of Sexual Health Centre attendees	41
2.3 Repeated testing at the Sexual Health Centres	54
2.4 Trends in Sexual Health Centre consultations	56
2.4.1 Trends in specific risk groups	56
2.4.2 Partner notification trends	58
2.5 General practice	59
2.6 Sense	62
2.7 Sexual Health in the Health Survey	65
2.8 Consultations and characteristics of Sexual Health Centre attendees by region	68

BACTERIAL STI	73
3 Chlamydia, including lymphogranuloma venereum	75
3.1 Key points	75
3.1.1 Sexual Health Centres	75
3.1.2 General practitioner	75
3.1.3 Lymphogranuloma venereum at Sexual Health Centres	75
3.2 Sexual Health Centres: characteristics, risk groups and trends	76
3.3 General practitioner	85
3.4 Laboratory surveillance	86
3.5 Lymphogranuloma venereum at Sexual Health Centres	86
4 Gonorrhoea	89
4.1 Key points	89
4.1.1 Sexual Health Centres	89
4.1.2 General practitioner	89
4.1.3 Antimicrobial resistance of gonococci in the Netherlands	89
4.2 Sexual Health Centres: characteristics, risk groups and trends	90
4.3 General practitioner	99
4.4 Antimicrobial resistance of gonococci in the Netherlands	100
5 Syphilis	103
5.1 Key points	103
5.2 Sexual Health Centres: characteristics, risk groups and trends	104
5.3 Antenatal screening	111
5.4 Blood donors	111
5.5 Congenital syphilis	112
VIRAL STI	113
6 HIV and AIDS	115
6.1 Key points	115
6.1.1 Sexual Health Centres	115
6.1.2 HIV treatment centres	115
6.1.3 General practice	116
6.2 Sexual Health Centres: characteristics, risk groups and trends	116
6.3 HIV treatment centres	122
6.3.1 Newly diagnosed HIV cases in care in 2018	122
6.3.2 AIDS cases and deaths among HIV patients	128
6.4 Other sources	131
6.4.1 Antenatal screening	131
6.4.2 Blood donors	131
6.4.3 Amsterdam Cohort Studies	132
6.5 General practice	132

7	Genital warts	135
7.1	Key points	135
7.2	Sexual Health Centres: characteristics, risk groups and trends	136
7.3	General practice	139
8	Genital herpes	141
8.1	Key points	141
8.2	Sexual Health Centres: characteristics, risk groups and trends	142
8.3	General practice	146
9	Hepatitis B	147
9.1	Key points	147
9.2	Notification data: characteristics, risk groups and trends	148
9.3	Infectious hepatitis B diagnoses at the Sexual Health Centres	150
9.4	Antenatal screening	152
9.5	Blood donors	152
9.6	Hepatitis B vaccination programme for risk groups	153
10	Hepatitis C	155
10.1	Key points	155
10.2	Notification data: characteristics, risk groups and trends	156
10.3	Blood donors	157
11	Conclusions and recommendations	159
	APPENDICES	165
Appendix A	List of abbreviations	167
Appendix B	STI case-definitions of Sexual Health Centres	169
Appendix C	National surveillance of Sexual Health Centres	171
Appendix D	Stichting HIV Monitoring	173
Appendix E	Nivel Primary Care Database (Nivel-PCD)	177
Appendix F	STI publications (co-)authored by RIVM employees 2018	179

Summary

In 2018, a total of 152,217 consultations took place at Dutch Sexual Health Centres (SHC); almost equal to the number of consultations in 2017 (+1.1%). The number of consultations increased among MSM (+9.5%), whereas it decreased among women (-1.0%) and heterosexual men (-6.3%). Of all SHC visitors, 45% were female (68,710 consultations), 22% heterosexual male (33,041 consultations) and 33% MSM (49,873 consultations). At 484 consultations (0.3%), the client was a transgender person. Following the implementation of the General Data Protection Regulation (GDPR) in May 2018, 17,188 (11.3%) consultations were not registered in the national database, because the client did not provide consent to share data for surveillance purposes. To avoid a break in trends, the number of tests and positivity rates of chlamydia, gonorrhoea, syphilis and HIV, by gender and sexual preference, also include aggregated data of non-registered consultations. All other figures and tables using SHC data are based on the 135,029 registered consultations among 111,271 unique SHC visitors that did provide consent. Of these unique SHC visitors, 16% had two or more registered visits in 2018, comparable to 2017 and 2016. This percentage was highest among MSM (33.3%) and lower among heterosexual men (7.1%) and women (10.5%).

Of the SHC visitors, 18.2% tested positive for STI (chlamydia, gonorrhoea, infectious syphilis, HIV or infectious hepatitis B) in 2018. The positivity rate increased from 13.6% in 2010 to 18.4% in 2016, with an increase in 2015 in particular, however it has remained stable in the past three years for all sexual preferences. In 2018, the positivity rate was 16.1% among women and 18.9% among heterosexual men. Among MSM, the positivity rate varied between 19.2% and 21.2% since 2009 (20.6% in 2018). Positivity rates were highest among visitors notified for STI (33.1%) and among HIV-positive visitors (32.6%). Positivity rates were also high among those who reported STI symptoms (25.9%) and people with a low or medium level of education (21.9%). SHC regional positivity rates varied between 10.6% and 22.3%.

The total number of STI-related episodes recorded by general practitioners (GPs) based on a sample of 367 GPs in the Netherlands extrapolated to the Dutch population is twice the number of consultations reported at SHC, with an estimated 307,400 episodes (STI diagnoses and 'fear of STI') in 2017. This is an increase from the 281,300 episodes in 2016 and 267,400 episodes recorded in 2015. The increased reporting rate of STI-related episodes per 1,000 population at the GP was found mainly among people aged 25 years or older (15.9 in 2015, 16.9 in 2016, and 18.5 in 2017).

Bacterial STI

In 2018, chlamydia was diagnosed 21,021 times at the SHC, a decrease of 2% compared to 2017. The positivity rate has increased from 10.6% in 2009 to 15.4% in 2016 among women and from 10.8% to 18.0% among heterosexual men, but has remained stable in the latest two years; among women 15.4% in 2017 and 15.0% in 2018 and among heterosexual men 18.3% and 17.7%. The positivity rate among MSM has been stable at around 10% for many years (9.8% in 2018).

Most chlamydia infections were diagnosed in people aged under 25 (63% of registered diagnoses). Among known HIV-positive MSM, a decrease in positivity rate was recorded; from 17.6% in 2014 to 14.6% in 2017, however this stabilised in 2018 (14.8%). The number of lymphogranuloma venereum (LGV, an infection caused by an invasive strain of chlamydia) diagnoses further increased to 278 in 2018. In previous years, 80% of the LGV cases were diagnosed among HIV-positive MSM, but this percentage decreased to 50% in 2018 due to a large increase in LGV diagnoses among HIV-negative MSM. The percentage of asymptomatic rectal LGV cases increased from 32% in 2013 to 53% in 2018. The number of estimated chlamydia episodes reported in general practice (39,800) increased compared to the previous years. Reporting rates of chlamydia episodes per 1,000 population mainly increased among people aged under 25 (from 3.0 in 2016 to 3.3 in 2017).

The number of gonorrhoea diagnoses at the SHC increased by 9% to 7,362 diagnoses in 2018 compared to 2017. This increase was mainly due to a greater number of infected MSM. Positivity rates among women and heterosexual men remained low at 1.7% and 2.0% respectively. The positivity rate among MSM has increased over time, but stabilized in 2018 (11.2%) compared to 2017 (11.0%) and 2016 (11.3%). Since 2015, gonorrhoea has been the most frequently reported STI among MSM attending SHC. In general practice, the number of estimated gonorrhoea-episodes increased among men/women from 5,400/2,500 in 2015 to 6,100/2,850 in 2016 and 6,200/3,400 in 2017, mainly recorded in people aged 25 and older. Antimicrobial resistance to ceftriaxone, the first-choice antibiotic for gonorrhoea treatment, has not been reported among SHC visitors. Resistance levels to cefotaxime remained low at 1.9%, while resistance to azithromycin continued to increase from 2.1% in 2012 to 5.2% in 2017 and 10.8% in 2018.

In 2018, 1,224 syphilis infections were diagnosed at the SHC, similar to 2017 (1,228 infections) and 2016 (1,223 infections). Of all cases, 96% were among MSM. The syphilis positivity rate among MSM increased from 2011 to 2016, but declined slightly in 2017 to 2.4% in 2018. This was mainly due to a decrease in positivity rate among known HIV-positive MSM (from 7.2% in 2017 to 6.6% in 2018). Syphilis positivity rates among HIV-negative MSM remained stable (1.9% in 2017 and 1.8% in 2018). Positivity rates among women and heterosexual men remained very low (0.08 and 0.15%, respectively). Data on the number of syphilis episodes reported in general practice is lacking.

Viral STI

At the SHC, 249 new HIV-infections were diagnosed in 2018, a decrease compared to 2017 (286). Of these, 90% were among MSM. The HIV positivity rate among MSM at the SHC continued to decline to 0.5% in 2018 (0.7% in 2017 and 0.8% in 2016). HIV positivity rates among women and heterosexual men remained very low (0.05% and 0.07%, respectively). The majority of women and heterosexual men diagnosed with HIV at the SHC had a non-Western migration background (21/23, 91%). There were 909 newly registered HIV-patients in care at the HIV treatment centres of the HIV Monitoring Foundation in 2018 (1,037 in 2017). Of these, 527 were diagnosed in 2018 (615 in 2017), though this number can still increase due to reporting delay. In line with previous years, 69% of newly diagnosed HIV infections were found

in MSM. Overall, 48% of newly diagnosed patients presented late for care (CD4 <350/mm³ or AIDS). This proportion was lower for MSM (44%) than for women (59%) or for heterosexual men (68%). In 2017, an estimated 90% of those infected with HIV in the Netherlands were diagnosed and linked to care. Of these, 93% started therapy and 95% had a suppressed viral load.

Most cases of genital warts and genital herpes are registered by the GP. In 2017, an estimated 42,000 cases of genital warts (37,500 in 2016), and 25,800 cases of genital herpes (22,500 in 2016) were diagnosed. GPs reported genital warts more often in men than in women (58% of all cases), while genital herpes was more often diagnosed in women (75% of all cases). In 2018, the number of diagnoses of genital warts and genital herpes at the SHC was 1,314 and 426 respectively, with highest positivity rates among heterosexual men (based on registered consultations only).

The number of reported acute hepatitis B cases in the notification data decreased compared to the previous year (101 in 2018 versus 115 in 2017). Sexual contact was the most reported transmission route (59%). The number of reported acute hepatitis C cases has fluctuated around 60 cases from 2011 onwards (62 in 2018). The main reported transmission route for acute hepatitis C was sexual contact between men (61%).

Conclusion

The number of STI consultations at SHC increased in the years up to 2017, and stabilised in 2018. Positivity rates remained stable in 2018 compared to 2017 and 2016. The number of STI-related episodes at the GP increased. It is important to maintain an integrated surveillance of STIs and STI risk among high-risk groups that visit the SHC. It is also important to keep track of the general population, who test mainly through other care providers or self-testing. As in previous years, SHC data show that groups at higher risk for STI, as reflected in high positivity rates, were those notified for STI by their (ex) partner, those who reported STI symptoms, were HIV-positive, and those who had an STI in the past year. Surveillance of risk behaviour among MSM in relation to Pre-exposure prophylaxis (PrEP) use will be important. Further efforts, such as promotion of condom use, repeat testing, and more effective (timely and complete) partner notification are needed to ensure that people in high-risk groups are effectively targeted. Testing and treatment strategies need to be optimised to maximize the effect of control efforts and to reach those most in need of care.

Samenvatting

In 2018 hebben er in totaal 152.217 consulten plaatsgevonden bij de Centra Seksuele Gezondheid (CSG's); vrijwel gelijk aan het aantal consulten in 2017 (+1,1%). Het aantal consulten nam toe onder MSM (+9,5%) en nam af onder vrouwen (-6,3%) en heteroseksuele mannen (-1,0%). Van alle CSG-bezoekers was 45% vrouw (68.710 consulten), 22% heteroseksuele man (29.454 consulten) en 33% MSM (49.873 consulten). Er waren 484 soa-consulten (0,3%) bij transgender personen. De Algemene Verordening Gegevensbescherming (AVG) is van kracht per mei 2018, waardoor 17.188 van het totaal aantal consulten niet geregistreerd is in de nationale database omdat de cliënt bezwaar maakte tegen het delen van consultgegevens met het RIVM voor surveillancedoeleinden. Om een trendbreuk te voorkomen is het aantal consulten en de vindpercentages voor chlamydia, gonorrhoe, infectieuze syfilis en hiv per geslacht en seksuele voorkeur berekend met geregistreerde consulten en geaggregeerde data van niet-geregistreerde consulten. Aanvullende figuren en tabellen gebruikmakende van CSG data zijn gebaseerd op geregistreerde consulten (135.029 consulten) uitgevoerd bij 111.271 unieke personen die toestemming gaven. Van deze personen had 16% twee of meerdere consulten in 2018, vergelijkbaar met 2016 en 2017. Dit percentage was het hoogste onder MSM (33,3%), en lager onder heteroseksuele mannen (7,1%) en vrouwen (10,5%).

Het percentage personen met een positieve soa-test (chlamydia, gonorrhoe, infectieuze syfilis, hiv of infectieuze hepatitis B) was 18,2% in 2018. Het soa-vindpercentage steeg van 13,6% in 2010 naar 18,4% in 2016, voornamelijk door een stijging in 2015, maar is in de afgelopen 2 jaar stabiel gebleven bij zowel heteroseksuele mannen, vrouwen en MSM. In 2018 was het soa-vindpercentage 16,1% onder vrouwen en 18,9% onder heteroseksuele mannen. Het percentage MSM met één of meerdere soa varieert tussen 19,2% en 21,2% over de jaren (2018: 20,6%). De hoogste vindpercentages werden gezien bij personen die gewaarschuwd waren voor soa (33,1%) en onder hiv-positieve personen (32,6%). Vindpercentages waren ook hoog onder personen die klachten rapporteerden (25,9%) en personen met een laag of gemiddeld opleidingsniveau (21,9%). Het totale vindpercentage varieerde tussen de CSG regio's van 10,6% tot 22,3%.

Het totale aantal soa-gerelateerde episodes dat bij de huisarts werd geregistreerd gebaseerd op een selectie van 367 huisartsenpraktijken geëxtrapoleerd naar de Nederlandse populatie is het dubbele van het aantal bij de CSG's, met naar schatting 307.400 episodes (infecties en 'angst voor soa') in 2017. Dit is een toename ten opzichte van 2016 (281.300 episodes) en 2015 (267.400 episodes). Het aantal soa-gerelateerde episodes per 1.000 inwoners steeg voornamelijk bij personen ouder dan 25 (15.9 in 2015, 16.9 in 2018 en 18.5 in 2017).

Bacteriële soa

In 2018 zijn er 20.021 chlamydia-diagnoses gesteld bij de CSG's, een afname van 2% ten opzichte van 2017. Het vindpercentage steeg van 10,6% in 2009 tot 15,4% in 2016 onder vrouwen en van 10,8% tot 18,0% onder heteroseksuele mannen, maar is stabiel gebleven in

de afgelopen twee jaar; bij vrouwen 15,4% in 2017 en 15,0% in 2018, bij mannen 18,3% en 17,7%. Het percentage MSM met een chlamydia-infectie ligt al jaren rond de 10% (9,8% in 2018). De meeste infecties werden geregistreerd bij personen jonger dan 25 jaar (63% van geregistreerde consulten). Onder hiv-positieve MSM nam het vindpercentage af van 17,6% in 2014 naar 14,6% in 2017, maar bleef stabiel in 2018 (14,8%). Het aantal lymfogranuloma venereum (LGV, een infectie met een invasieve chlamydia variant) diagnoses nam toe tot 278 in 2018. In 2013 waren 80% van de personen met een LGV diagnose hiv-positief. Dit percentage nam af tot 50% in 2018, wat verklaard kan worden door een toename van LGV bij hiv-negatieve MSM. Asymptomatische rectale LGV is toegenomen van 32% in 2013 tot 53% in 2018. Het geschatte aantal chlamydia episodes gerapporteerd door huisartsen (39.800) nam toe ten opzichte van de afgelopen jaren. Het aantal chlamydia-episodes per 1.000 inwoners steeg voornamelijk bij mensen onder de 25 jaar (3,0/1,000 in 2016 tot 3,3/1,000 in 2017).

Het aantal gonorrhoe diagnoses bij de CSG's is met 9% toegenomen tot 7.362 diagnoses in 2018 vergeleken met 2017. Deze toename werd voornamelijk verklaard door een toename van MSM met de infectie. Het gonorrhoe-vindpercentage bleef laag onder heteroseksuele mannen en vrouwen (2,0% en 1,7% respectievelijk). Het gonorrhoe-vindpercentage nam de afgelopen jaren toe bij MSM, maar was in 2018 (11,2%) vergelijkbaar met 2017 (11,0%) en 2016 (11,3%). Sinds 2015 is gonorrhoe, in plaats van eerder chlamydia, de meest gerapporteerde soa onder MSM. Het aantal geschatte gonorrhoe-episodes bij de huisarts nam toe bij mannen/vrouwen van 5.400/2.500 in 2015 tot 6.100/2.850 in 2017 en 6.200/3.400 in 2018, voornamelijk onder personen ouder dan 25 jaar. Antibioticaresistentie tegen ceftriaxon, het huidige eerste keus antibioticum voor de behandeling van gonorrhoe, is nog niet gerapporteerd bij CSG-bezoekers. Resistentie tegen cefotaxim bleef laag, op 1,9%, maar resistentie tegen azitromycine bleef toenemen van 2,1% in 2012 tot 5,2% in 2017 en 10,8% in 2018.

In 2018 werden er 1.224 syfilis infecties gediagnosticeerd bij de CSG's, nagenoeg hetzelfde aantal als in 2017 (1.228 infecties) en 2016 (1.223 infecties). Hiervan werd 96% vastgesteld onder MSM. Tussen 2011 en 2016 nam het syfilis-vindpercentage onder MSM steeds toe, maar is weer afgenomen sinds 2017 tot 2,4% in 2018. Dit kwam voornamelijk door een afnemend vindpercentage onder bekend hiv-positieve MSM (van 7,2% in 2017 naar 6,6% in 2018). Het syfilis-vindpercentage onder hiv-negatieve MSM bleef stabiel (1,9% in 2017 en 1,8% in 2018). Onder vrouwen en heteroseksuele mannen bleef het vindpercentage zeer laag (respectievelijk 0,08% en 0,15%,). Een schatting van het aantal syfilis infecties bij de huisartsen is niet beschikbaar.

Virale soa

Bij de CSG's werden 249 nieuwe hiv infecties gevonden in 2018, iets minder dan in 2017 (286). Hiervan werd negentig procent bij MSM vastgesteld. Het hiv-vindpercentage onder MSM bij de CSG bleef dalen tot 0,5% in 2018 (van 0,7% in 2017 en 0,8% in 2016). Vindpercentages onder vrouwen en heteroseksuele mannen bleven zeer laag (respectievelijk 0,05% en 0,07%). Het merendeel van vrouwen en heteroseksuele mannen die gediagnosticeerd werden met hiv bij een CSG had een migratieachtergrond uit een soa/hiv endemisch land (21/23 = 91%).

In 2018 zijn 909 nieuwe hiv-patiënten aangemeld in zorg bij Stichting HIV Monitoring (SHM) (1.037 in 2017). Van hen waren 527 personen ook gediagnosticeerd in 2018 (dit was 615 in 2017), maar dit aantal kan nog oplopen door rapportagevertraging. Vergelijkbaar met voorgaande jaren werd 69% van de nieuw gediagnosticeerde hiv-infecties vastgesteld bij MSM. Van de nieuw gediagnosticeerde patiënten kwam 48% laat in zorg ($CD4 < 350/mm^3$ of aids). Dit percentage was lager voor MSM (44%) dan voor vrouwen (59%) en heteroseksuele mannen (68%). Geschat wordt dat in 2017 90% van alle personen met hiv in Nederland gediagnosticeerd en in zorg was. Van hen was 93% ook gestart met behandeling, en daarvan had 95% een onderdrukte virale lading.

Voor genitale wratten en genitale herpes wordt veruit het grootste deel van de diagnoses gesteld bij de huisarts. In 2017 waren er naar schatting 42.000 diagnoses van genitale wratten (37.500 in 2016) en 25.800 diagnoses van genitale herpes (22.500 in 2016). Huisartsen rapporteerden genitale wratten vaker bij mannen dan bij vrouwen (58%), terwijl genitale herpes vaker bij vrouwen werd gezien (75%). In 2018 lag het aantal diagnoses van genitale wratten en genitale herpes bij de CSG's veel lager met 1.314 en 426 diagnoses respectievelijk, waarbij de vindpercentages het hoogst waren bij heteroseksuele mannen (gebaseerd op geregistreerde consulten).

Het aantal acute hepatitis B infecties in de aangiftecijfers was afgenomen in vergelijking met het voorgaande jaar (101 in 2018 versus 115 in 2017). Onbeschermd seksueel contact was de meest gerapporteerde transmissieroute (59%). Het aantal acute hepatitis C gevallen fluctueert sinds 2011 rond de 60 gevallen per jaar (62 in 2018). De belangrijkste transmissieroute van acute hepatitis C was onbeschermd seksueel contact tussen mannen (61%).

Conclusie

Het aantal soa-consulten bij de CSG's nam toe tot 2017 en stabiliseerde in 2018. Vindpercentages bleven vrijwel gelijk in 2018 vergeleken met 2017. Bij huisartsen blijft het aantal soa-gerelateerde episodische toenemen. Surveillance van soa en risico op soa onder hoog-risico groepen die de CSG's bezoeken is belangrijk, maar voor een geïntegreerde soa surveillance is het ook noodzakelijk om zicht te houden op de algemene populatie, welke zich meer via andere zorgaanbieders of met een zelf-test laat testen. Net als in voorgaande jaren waren de groepen met hoog risico op soa, gereflecteerd in hoge vindpercentages, personen die waren gewaarschuwd door een (ex-)partner, personen die soa klachten rapporteerden, hiv positieve personen, en personen die in het afgelopen jaar een soa hadden gehad. Surveillance van risicogedrag bij MSM in relatie tot Pre-Expositie Profylaxe (PrEP) gebruik wordt belangrijker. Verdere inspanningen, zoals promotie van condoomgebruik, herhaald testen, en effectievere (tijdige en complete) partnerwaarschuwing zijn nodig om te zorgen dat hoog-risico groepen effectief bereikt worden. Test- en behandelstrategieën moeten geoptimaliseerd worden om het effect van deze strategieën te maximaliseren en om degenen die zorg het meeste nodig hebben goed te kunnen bereiken.

Introduction

This report summarises current trends in the epidemiology of STI, including HIV, in the Netherlands. It was prepared by the Centre for Infectious Disease Control (CIb) at the National Institute for Public Health and the Environment (RIVM). The CIb collaborated with various partners in the field of STI to collect data for surveillance and to generate insights into trends and determinants: The Sexual Health Centres (SHC), the HIV Monitoring Foundation (SHM), public health laboratories, general practitioners participating in the NIVEL Primary Care Database, and other health care providers.

The data that are systematically collected among high-risk groups by the nationwide network of SHC under the responsibility of the Public Health Services (PHS) are the backbone of the Dutch STI surveillance and STI trends and risk factors. Other available STI data from surveys, screening programmes, national registries, cohort studies, and other surveillance systems are included where possible. Together they provide an overview of the status of STI/HIV in the Netherlands. Preliminary data have been presented in the Thermometer Seksuele Gezondheid (April 2019).

Outline of the report

Chapter 1 describes the methodology of each data source used for STI surveillance in the Netherlands. In chapter 2, the characteristics of the SHC attendees and data from sexual health consultations among young people (Sense) in 2018 are presented. Data from general practitioners are shown for 2017. Chapters 3-5 present data on bacterial STIs (chlamydia, gonorrhoea and syphilis) and chapters 6-10 focus on viral STIs (HIV, genital warts, genital herpes, hepatitis B and hepatitis C). Conclusions and recommendations are captured in chapter 11.

1 Methodology of STI and HIV surveillance

The tables and figures in this report are based on a variety of data sources and present an up-to-date overview of the STI/HIV epidemic in the Netherlands. This overview is based on the systematic surveillance among high-risk groups embodied in the nationwide system of Sexual Health Centres (SHC). Data from general practitioners (GPs), who perform the bulk of STI consultations, were extrapolated from the NIVEL Primary Care Database. We included data from the HIV treatment centres (HIV Monitoring Foundation) to gain insights into trends among HIV patients in care. Other additional data sources include the national Lifestyle Monitor, weekly virological laboratory reports, the Gonococcal Resistance to Antimicrobials Surveillance (GRAS) programme, the antenatal screening, the data on hepatitis B and C notifications, the hepatitis B vaccination programme for risk groups, and the blood donor registry.

1.1 National surveillance at Sexual Health Centres

From 1995 onwards, STI diagnoses have been registered in an STI database at the RIVM in the Netherlands. In 2003, an STI sentinel surveillance system was implemented, achieving national coverage in 2004. Since 2006, reporting to the national STI surveillance system has been organised in eight regions. One of the SHC in each region is responsible for the coordination of STI surveillance (Figure 1.1). In total, 24 SHC, mostly within the Public Health Services (PHSs), provide low threshold, free-of-charge STI/HIV testing and care, targeting high-risk groups. Inclusion criteria are: (1) reporting STI related symptoms, (2) notified for STI exposure, (3) MSM, (4) originating from an HIV/STI endemic area, (5) reporting a partner from an HIV/STI endemic area or MSM, (6) aged under 25, (7) sex worker, or (8) victim of sexual violence. Since 2015, because of changes in financial restrictions, the SHC have more strongly prioritised populations at highest risk of STI, e.g. clients who are notified or report symptoms related to STI. This change should be taken into account when interpreting trends, as it can lead to higher STI positivity rates.

Until 2011, attendees were routinely tested for chlamydia, gonorrhoea and syphilis, with an opt-out policy for HIV testing. Between 2012 and 2014, attendees aged under 25 with no other indication criteria were tested for chlamydia only. If the chlamydia test result was positive, further testing for gonorrhoea, syphilis and HIV took place. From 2015 onwards, attendees aged under 25 were tested for chlamydia and gonorrhoea, and additionally for syphilis, HIV and/or HBV if indicated. Briefly, indications for additional STI testing are: (1) notified for syphilis, HIV, LGV, HBV or HCV, (2) symptoms related to syphilis or HIV, (3) sex workers, (4) clients of sex workers, (5) MSM, (6) first generation immigrants from STI/HIV endemic areas, (7) a partner from STI/HIV endemic areas or MSM (8) victims of sexual violence.

The testing policy for attendees aged over 25 did not change: routine testing for chlamydia, gonorrhoea and syphilis, and an opt-out policy for HIV testing¹. The changes in testing policy need to be taken into account when interpreting trend data, as they may cause a break in the trends. Hepatitis B and C, genital herpes, trichomonas and LGV are tested on indication only. Since 1 January 2011, the migration background has been based on the client's country of birth and the client's parents (foreign background if at least one parent was born abroad), as opposed to the previously used self-reported migration background. First generation migrants are born abroad; second generation migrants are born in the Netherlands, but one or both parent(s) were born abroad (following CBS² definitions). All consultations and corresponding diagnoses are reported online to the RIVM for surveillance purposes, a process facilitated by a web-based application (SOAP). The unit of analysis is 'new STI consultation' and reports contain epidemiological, behavioural, clinical and microbiological data on a wide range of STI. In 2014, an identification number was added to the data collection which allows identification of clients who tested repeatedly at the same clinic. We discuss the number of repeated visits and the STI positivity by number of consultation in Chapter 2.

In this report, the results of SHC national surveillance are presented with respect to the number and nature of new consultations and diagnoses. We focus on the major bacterial and viral STI, including HIV infection. Trends in positivity rate by risk profile (based on demographic and behavioural indicators) are based on data from SHC under national surveillance from 2009 to 2018. In May 2018, the GDPR (AVG in Dutch) was implemented in the Netherlands. From that moment onwards, all SHC attendees had to give consent to share their consultation data with RIVM for surveillance purposes. For this report, aggregated anonymised data of non-registered consultations were obtained from the SHC on total chlamydia, LGV, gonorrhoea, syphilis, and HIV tests diagnoses, stratified by gender and sexual preference. Aggregated data of non-registered consultations was added to registered consultations to calculate the total number of consultations and positivity rates for chlamydia, LGV, gonorrhoea, syphilis and HIV, by gender and sexual preference. From SHC with fewer than 50 non-registered consultations, only the total was obtained, which we added to the total number of consultations. Demographic and behavioural indicators were not available for non-registered consultations. Therefore, all other tables and figures regarding trends in positivity rate by risk profiles are based on registered consultations only. Where aggregated data of non-registered consultations were added to registered consultations, this is indicated.

¹ See Draaiboek: <https://lci.rivm.nl/draaiboeken/consult-seksuele-gezondheid>

² Definition of Migration background, see Definitions Statistics Netherlands ('Begrippen CBS'): <https://www.cbs.nl/en-gb/our-services/methods/definitions?tab=m#id=migration-background>

Figure 1.1 Eight regions with coordinating SHC indicated



- Regio Noord - GGD Groningen
- Regio Noord-Holland en Flevoland - GGD Amsterdam
- Regio Noordelijk Zuid-Holland - GGD Haaglanden
- Regio Zuidelijk Zuid-Holland - GGD Rotterdam-Rijnmond
- Regio Zeeland Brabant - GGD Hart voor Brabant
- Regio Utrecht - GGD Regio Utrecht
- Regio Oost - GGD Gelderland-Zuid
- Regio Limburg - GGD Zuid Limburg

Footnote: GGD Gooi en Vechtstreek (grey striped region) does not have an SHC. Hence, no STI data were available for this region.

1.2 Sense

To strengthen primary prevention and to promote sexual health among young adults (<25 years), a nationwide network of consultation centres (Sense) was established under the coordination of the same PHSs that coordinate the SHC. Young adults can anonymously contact these Sense locations free-of-charge for information and personal consultations on a broad range of subjects relating to sexual health, including (problems with) sexual intercourse, unwanted pregnancy, birth control, STI, homosexuality, sexual violence, or lover-boys. Data on the number and demographics of Sense consultations visitors are presented. From 2014 onwards, demographic information and the subject of Sense consultations are reported in the national STI/HIV surveillance system. However, results are difficult to interpret, as registration of Sense consultations is not uniform across SHC.

1.3 Sexual Health in the Health Survey/Lifestyle Monitor

From 2014, data on different lifestyle aspects in a representative sample of the Dutch population have been collected in the national Health Survey (Health Survey/Lifestyle Monitor, Statistics Netherlands (CBS) in collaboration with RIVM, Rutgers and Soa Aids Nederland (SANL), 2017), i.e. substance use, physical activity, nutrition, accidents and sexual health. A standard set of indicators is collected for each of these topics, annually³. The 2017 sexual health data were collected for a total of 3,551 men and 4,022 women aged between 16 and 85. We present a selection of the 2017 results in this report, with the aim of describing the characteristics related to sexual health and STI healthcare of the Dutch general population. Data were weighted for demographic characteristics to correct for differences between the sample and the total Dutch population.

1.4 STI surveillance in general practice

Data on the incidence of STI in general practice are obtained through the primary care surveillance network maintained at the Netherlands Institute for Health Services Research (Nivel), which is based on electronic health records in a network of GPs, Nivel Primary Care Database (Nivel-PCD)⁴. The network uses routinely collected data from health care providers to monitor health and utilisation of health services in a representative sample of the Dutch population. All complaints and illnesses are recorded using the International Classification of Primary Care (ICPC-1) codes⁵. From 2010 onwards, the network of GPs gradually expanded from 120 practices to a larger network including over 500 practices. Data on the incidence of STI episodes in the population covered by this network from 2009 to 2017 are included in this

³ Health Survey/Lifestyle Monitor, Statistics Netherlands (CBS) in collaboration with National Institute for Public Health and the Environment (RIVM), Rutgers and Soa Aids Nederland, 2017.

⁴ Verheij RA, Koppes LLJ. Over NIVEL Zorgregistraties. Uit: NIVEL Zorgregistraties eerste lijn [internet]. 2019 [Laatst gewijzigd op 03-12-2018; geraadpleegd op 27-03-2019]. URL: www.nivel.nl/nl/zorgregistraties-eerste-lijn/over-nivel-zorgregistraties

⁵ Lamberts H, Wood MR. ICPC: International Classification of Primary Care. Oxford: Oxford University Press, 1987.

report. This is restricted to data from practices with good quality morbidity data, which comprised 372 practices in 2014, 416 in 2015, 350 in 2016 and 367 in 2017. Incidence rates were calculated based on the number of reported episodes per 1,000 population⁶. Annual estimates of the total number of episodes seen at GPs in the Netherlands were made by extrapolating the reporting rates in these practices to the total number of Dutch residents, as obtained from Statistics Netherlands (CBS), reported by gender and age group (<25 years and ≥25 years). For syphilis and HIV, the number of incident cases reported was too small for reliable incidence estimates. For HIV, we report prevalence rates based on estimates from Nivel-PCD. HIV is defined as a 'chronic, non-reversible morbidity', which remains prevalent as long as the patient is registered in the network. For chlamydia, which does not have a main ICPC code, we used the 'chlamydia-related' ICPC codes in combination with prescription and laboratory data. The chlamydia-related ICPC codes include vaginitis (X84), cervicitis (X85) and Pelvic Inflammatory Disease (PID) (X74) in women, and orchitis/epididymitis (Y74) and other genital diseases (Y99) in men⁷.

The percentage of chlamydia episodes was estimated for each chlamydia-related ICPC main code. The chlamydia incidence rate was computed by combining these percentages with the incidence rates of the separate chlamydia-related ICPC codes. The percentage of chlamydia episodes per ICPC were based on the proportion of the chlamydia-related ICPC code with:

- an appropriate chlamydia-related prescription, i.e. azithromycin or doxycycline, in practices with good quality morbidity and prescription data (all 367 practices in 2016)
- or: a positive chlamydia laboratory result. Because only a part of the practices have sufficient laboratory reports (304 practices in 2016), the number of chlamydia infections based on a positive laboratory result was extrapolated to all practices with good quality morbidity and prescription data.

Furthermore, more detailed data on STI consultations at the GP are reported from a subgroup of practices within Nivel-PCD, which participate in more intensive data collection for surveillance (Nivel sentinel practices). Since 2008, the 45 GP practices participating in this specific sentinel network have completed a questionnaire for each new consultation on STI/HIV issues. The questionnaire addresses STI testing, diagnoses and background information on patient characteristics, with reference to migration background, sexual preference and sexual behaviour⁸. We report the main results on patients' profiles, testing rates and positivity, as well as trends from 2014 to 2018. In 2015, the questionnaire format changed from paper forms to electronic registration. Some questions were slightly altered (from multiple choice to single choice), which may have had an impact on the results.

⁶ Nielen MMJ, Davids R, Gommer M, Poos R, Verheij RA. Berekening morbiditeitscijfers op basis van NIVEL Zorgregistraties eerste lijn. Uit: NIVEL Zorgregistraties eerste lijn [internet]. 2019 [Laatst gewijzigd op 08-01-2019; geraadpleegd op 27-03-2019]. URL: www.nivel.nl/nl/zorgregistraties-eerste-lijn/incidentie-en-prevalentiecijfers

⁷ Van den Broek IVF, Verheij RA, van Dijk CE, Koedijk FDH, van der Sande MAB, van Bergen JEAM. Trends in sexually transmitted infections in the Netherlands, combining surveillance data from general practices and sexually transmitted infection centres. *BMC Family Practice*, 2010, 11:39.

⁸ Trienekens SCM, van den Broek IVF, Donker GA, et al. Consultations for sexually transmitted infections in the general practice in the Netherlands: an opportunity to improve STI/HIV testing. *BMJ Open* 2013;3:e003687. doi: 10.1136/bmjopen-2013-003687.

1.5 Laboratory surveillance

National laboratory surveillance data are not available for STI, except for data from the weekly virological reports, which include the total number of *Chlamydia trachomatis* positive tests from 21 participating laboratories. The coverage of these laboratories and representativeness for the Dutch population is not precisely known, but the laboratories are spread over the whole country and the coverage is sufficient to provide accurate and timely trends for (virological) infections and chlamydia⁹. There is an overlap between the laboratories reporting in this system and the laboratories connected to the SHC.

1.6 Antimicrobial resistance of gonococci

Concerns about increasing resistance to quinolones at (inter)national level led to an RIVM laboratory survey of the resistance of gonococci in 2002¹⁰. Because the results demonstrated the need for systematic nationwide surveillance of gonococcal antimicrobial resistance, in 2006 the Gonococcal Resistance to Antimicrobials Surveillance (GRAS) was implemented in the Netherlands. This survey consists of the systematic collection of data on gonorrhoea and resistance patterns, linked with epidemiological data. Of the 24 SHC, 18 participate in the survey, who diagnosed 88% of all gonorrhoea cases. Gonorrhoea is usually diagnosed using PCR. Within GRAS, additional culture and susceptibility testing of isolates is performed using E-tests. Resistance levels are calculated using the EUCAST breakpoints for resistance¹¹. In 2019, the breakpoints for azithromycin resistance were changed. Trends of azithromycin resistance have retrospectively been altered based on the new cut off value.

1.7 Antenatal screening

Each year in the Netherlands, around 175,000 pregnant women are screened for syphilis, HBV and HIV. The blood sample is collected at the first midwife appointment (<13th week of the pregnancy) according to the opting-out principle, whereby pregnant women undergo the test after being provided with information, unless they explicitly state that they do not wish to participate. Almost all pregnant women in the Netherlands participate in this infectious disease screening programme (0.06% refused HIV-tests and 0.00% refused hepatitis B and syphilis testing in 2016)¹². The screening programme is coordinated by the Centre for Population Screening (CvB) at the RIVM.

⁹ See website: <https://www.rivm.nl/virologische-weekstaten>

¹⁰ Van Loo IH, Spaargaren J, van de Laar MJW. Resistance of Gonococci in the Netherlands; Results of a survey of Medical Microbiology Laboratories. *Ned Tijdschr Geneeskd*. 2005;149(22):1217-1222. [Dutch].

¹¹ The European Committee on Antimicrobial Susceptibility Testing. Breakpoint tables for interpretation of MICs and zone diameters. Version 9.0, 2019. http://www.eucast.org/clinical_breakpoints/

¹² Van der Ploeg CPB, Schönbeck Y, Oomen P, Vos K. PSIE Procesmonitor 2016. Belangrijkste resultaten Prenatale Screening Infectieziekten en Erythrocytenimmunisatie (PSIE) over 2016. TNO/RIVM 2018.

1.8 Congenital syphilis

The RIVM-IDS (Centre for Infectious Diseases Research, Diagnostics and Laboratory Surveillance) offers Immunoglobulin M (IgM) diagnostics for neonates and young infants (<1 year) who may have been exposed to syphilis. We present national results from 2009-2018 in this report.

1.9 National registration of patients registered at HIV treatment centres

In January 2002, an HIV reporting system for patients entering care was implemented in the Netherlands. Pseudonymised longitudinal data of almost all newly registered HIV-positive individuals are collected by the HIV Monitoring Foundation (SHM). The goal of SHM is to monitor HIV-positive individuals registered at the 26 recognised HIV treatment centres and four children's HIV centres in the Netherlands, in order to study changes in the epidemic, the effects of treatment, and the quality of care. All HIV-positive individuals registered in this national cohort are followed prospectively from the time of reporting in care. HIV-positive individuals in care diagnosed prior to the start of SHM were included in the cohort retrospectively. HIV cases diagnosed before 1996 mainly include people who survived up to the start of the ATHENA clinical cohort in 1996, the predecessor of SHM. The epidemiological data on newly reported HIV infections as well as trends in new AIDS diagnoses after 2000 are reported in collaboration with the Clb at the RIVM¹³. The number of people living with HIV in the Netherlands in 2017 was estimated by using the European Centre for Disease Prevention and Control (ECDC) HIV Modelling Tool¹⁴.

1.10 HIV incidence data

HIV incidence data are obtained from the Amsterdam Cohort Studies (ACS) on HIV/AIDS and blood donations. In 1984, the Amsterdam Cohort Studies on HIV and AIDS started registering men who have sex with men (MSM). The original aims were to investigate the epidemiology, psychosocial determinants, natural history, and pathogenesis of HIV-1 infection and AIDS, as well as to evaluate the effect of interventions in HIV-negative and HIV-positive MSM. In the past decade, the focus has broadened to include the epidemiology and natural history of blood-borne and sexually transmitted infections other than HIV. The collaborating institutes within the ACS framework are Sanquin Blood Supply Foundation, the PHS of Amsterdam (GGD Amsterdam), the Amsterdam University Medical Centre (Amsterdam UMC), the Jan van Goyen Medical Centre, the DC klinieken Amsterdam, and the HIV Monitoring Foundation (SHM).

¹³ van Sighem AI, Boender TS, Wit FWNM, Smit C, Matser A, Reiss P. HIV Monitoring Report 2018, Human Immunodeficiency Virus (HIV) Infection in the Netherlands. Amsterdam: Stichting HIV Monitoring, 2018. Available online at www.hiv-monitoring.nl

¹⁴ European Centre for Disease Prevention and Control. HIV estimates accuracy tool [Internet, software application]. Stockholm: ECDC; 2018. Available from: <https://ecdc.europa.eu/en/publications-data/hiv-estimates-accuracy-tool>

1.11 Notification of hepatitis B and C

The mandatory notification includes epidemiological data on newly diagnosed acute hepatitis B virus (HBV) infections (since 1976), and on chronic HBV infections and acute hepatitis C virus (HCV) infections. From January 2019, reporting chronic HCV infections is also mandatory. Since 2002, all PHSs have notified HBV and HCV infections using the web-based application OSIRIS. Since chronic HBV infections are already reported in the annual report of the National Immunisation Programme in the Netherlands¹⁵, only data on acute HBV and acute HCV infections are included in this report. Chronic HCV cases will be reported as from 2020.

1.12 Hepatitis B vaccination programme for risk groups

Being a low-endemic country, the Netherlands adopted a vaccination programme targeted at behavioural high-risk groups. The programme offers free vaccination to MSM and sex workers. Heterosexuals with an STI indication were also considered a risk group until October 2007, and drug users until January 2012. PHSs and SHC offer complimentary vaccination according to the six-month schedule. Participants are tested serologically for markers of previous or current HBV infection during their consultation for a first vaccination. Data are collected from the registration system specifically developed for the vaccination programme. Although universal childhood vaccination was adopted in 2011, the current targeted risk group vaccination programme will need to be continued in coming years.

1.13 Blood donors

From 1985 onwards, blood donated by (new and regular) blood donors has been screened for HIV, hepatitis B and C, and syphilis. Volunteers are screened according to quality and safety guidelines, and people who report specific risk factors for blood-transmitted infections are not accepted as donors. Records are kept in the national donor registry of Sanquin, which provides good information on the prevalence and incidence of these infections in a low-risk population. Data from 2007-2018 are reported.

¹⁵ The National Immunisation Programme in the Netherlands, Surveillance and developments in 2017-2018. RIVM report 2018-0124. Available from: <https://www.rivm.nl/publicaties/national-immunisation-programme-in-netherlands-surveillance-and-developments-in-2017>

2 Sexual health, STI and Sense consultations

2.1 Key points

2.1.1 Sexual Health Centres

- In 2018, the total number of consultations was 152,217; similar to the number of consultations in 2017 (+1.1%). The number of consultations increased among MSM (+9.5%), but decreased among heterosexual men (-6.3%) and women (-1.0%).
- Of these consultations, 135,029 were registered by SHC under national surveillance. Client consent to share data for surveillance purposes was not obtained for 17,188 consultations.
- The percentage of non-registered consultations were equal among gender, sexual preference and age; 11.0% in women, 10.9% in heterosexual men, 11.8% in MSM, 10.4% in people aged under 25 and 11.4% in people aged 25 and older.
- In 484 consultations (0.3%), the client was a transgender person. Of these consultations, 104 (21.5%) were not registered.

The following key points are based on registered consultations only.

- Key characteristics of attendees were as follows: female (45.1%), young age (50.9% <25 years), Dutch origin (68.5%), ≥3 sexual partners in the previous 6 months (58.9%), previously tested for gonorrhoea/chlamydia/syphilis in the past year (44.7%) and STI/HIV-related symptoms (26.3%).
- The percentage of attendees with at least one STI increased from 13.6% in 2010 to 18.4% in 2016, and remained stable in 2017 (18.4%) and 2018 (18.2%). STI positivity remained stable among all sexual preferences compared to the previous two years; 16.1% in 2018 and 16.3% in 2017 in women, 18.9% in 2018 and 19.6% in 2017 in heterosexual men, and 20.6% in 2018 and 20.5% in 2017 in MSM.
- The STI positivity was highest in people notified (33.1%), or with STI/HIV-related symptoms (25.9%), in people with a previous HIV diagnosis (32.6%) and in low/medium educated people (21.9%).
- Of all MSM, 77.5% reported insertive anal sex and 70.1% receptive anal sex, of whom 25.0% reported consistent condom use. Women and heterosexual men reported very low consistent condom use in vaginal sex (7.5% and 6.8% respectively). Consistent condom use with oral sex was low (2.2% of women and 1.0% of MSM).
- Of all MSM, 15.5% reported group sex, 8.3% reported sex with HIV-positive MSM and 15.5% reported drug use in relation to sex in the preceding 6 months. STI positivity rates were higher in MSM reporting these behaviours. Pre-Exposure Prophylaxis (PrEP) was reported at 1,973 (4.5%) of consultations of 1,170 unique MSM. At 73.3% of these consultations, PrEP was obtained from a Dutch health care provider. The STI positivity rate was 29.2% in MSM reporting PrEP use in the preceding 6 months.

- The percentage of SHC attendees who reported being notified by a partner remained stable compared to the previous year; 19.2% in 2018 to 19.6% in 2017. As in previous years, this percentage was highest among heterosexual men (27.0%, versus 18.4% in MSM and 16.1% in women).
- Among heterosexual men diagnosed with an STI, 44.8% were detected through partner notification. This proportion has increased over time (31.7% in 2010) and has been stable in the past three years. A similar increase was observed in MSM and women, although the proportions of STI detected through partner notification decreased in 2017 compared to 2016 and remained stable in 2018; 30.3% in MSM and 33.5% in women. Among MSM, one third of all newly diagnosed HIV infections were attributable to clients who were notified for STI exposure.
- Of all unique MSM who tested at the SHC in 2018, 33.3% had multiple consultations (34.6% in 2017). Among women and heterosexual men, this was 10.5% (11.4% in 2017) and 7.1% (8.8% in 2017) respectively.
- Of all transgender clients, 50.0% had a non-Western migration background and 39.2% was a sex worker in the previous 6 months. The STI positivity rate among transgender clients was 17.4%.
- In 2018, 12,898 clients were tested for chlamydia/gonorrhoea using a home sampling kit provided by the SHC (9.6% of all tests), and 7,983 clients were tested for STI/HIV via 'Man tot Man' (5.9% of all tests).
- In 2018, 6,199 and 2,031 Sense consultations were registered among women and men respectively. The registration of Sense consultations is not uniform across SHC.

2.1.2 General practice

- In 2017, the number of STI-related episodes at GPs (based on ICPC codes for episodes of fear of STI and STI diagnoses registered in the Nivel Primary Care Database (Nivel-PCD) was estimated at 307,400 in the Netherlands, an increase compared to 2016. This increase was mainly among people aged 25 and older.

2.1.3 Health Survey

- In 2017, 12.7% of women aged 16-29 years reported having been tested for an STI in the previous year, and 7.8% for HIV. For heterosexual men aged 16-29 years, the percentages were lower; 7.2% for STI and 5.8% for HIV. Higher proportions were seen among men attracted to men aged 16-44, with 23.1% testing for STI and 23.5% for HIV in the past year. Percentages declined with increasing age.

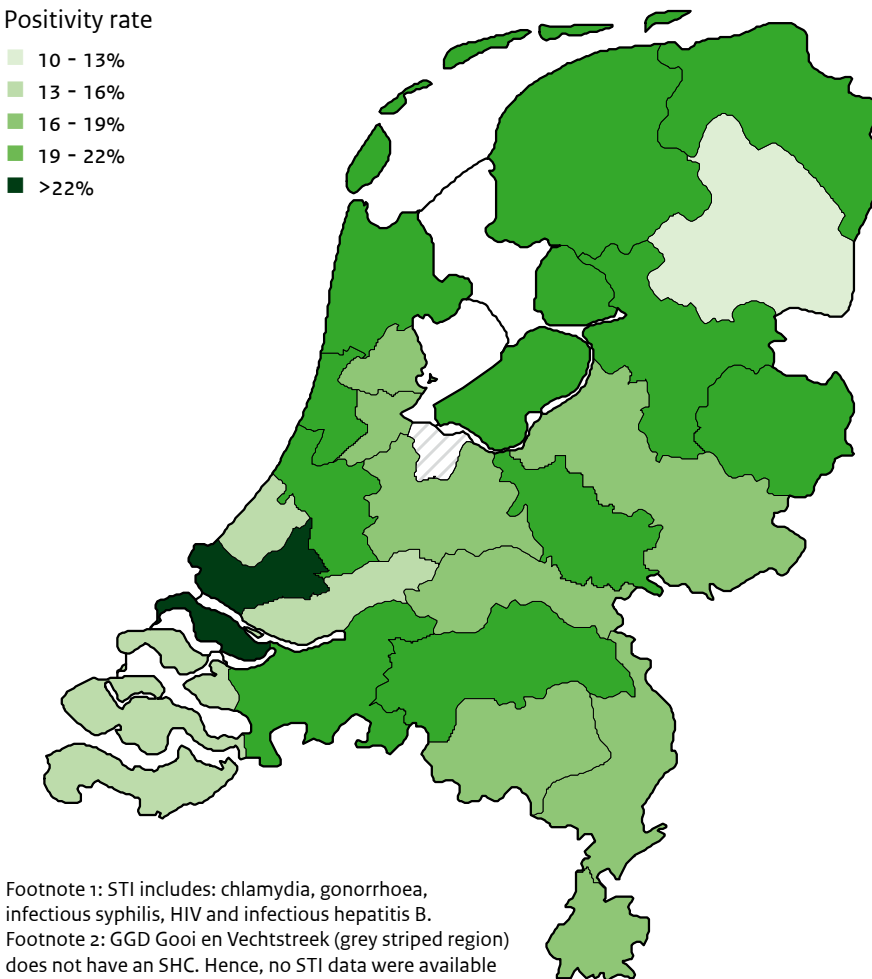
2.1.4 Regional surveillance

- In 2018, the number of STI consultations per 1,000 inhabitants aged 15-65 was by far the highest in Amsterdam (57.0); an increase of 17.4% compared to 2017 (47.0). For other regions, this number ranged from 2.5 in Drenthe to 16.4 in Flevoland.
- STI positivity rates ranged between 13.4% and 22.0% in 2018, similar to 2017 (between 14.1 and 22.3%). STI positivity rates were highest in Zuid-Holland Zuid (19.8% in women, 21.9% in heterosexual men, and 22.0% in MSM), and lowest in Zuid-Holland Noord (13.4% in women, and 14.6% in heterosexual men) and Noord-Nederland (17.3% in MSM).

- The differing positivity rates by region may be explained by differences in SHC attendee characteristics. Variability between the regions was seen in percentage of attendees with low/medium education level, in age distribution, and the percentage of people who were notified of STI/HIV exposure or reported STI-related symptoms. In 2018, the distribution of these attendee characteristics in each region was similar to 2017.

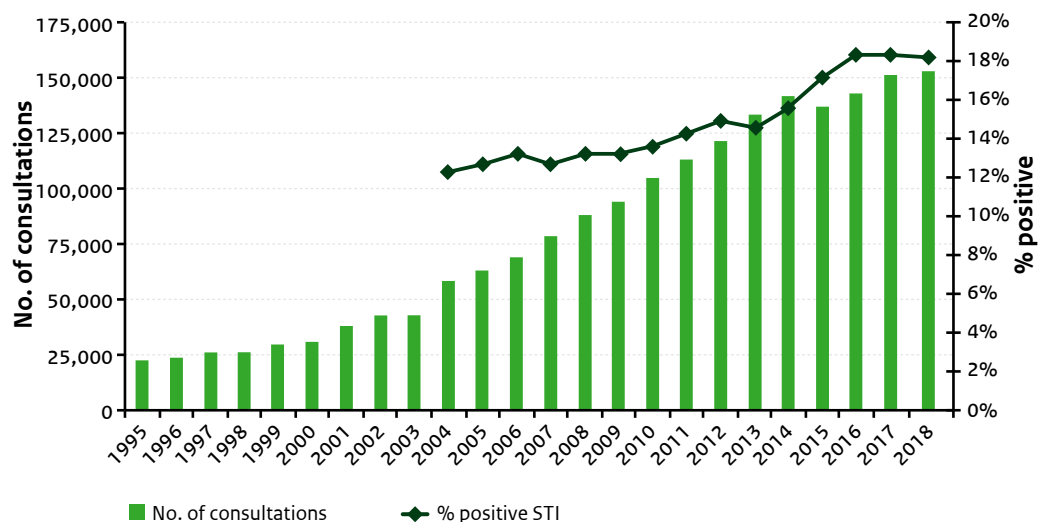
2.2 Consultations and characteristics of Sexual Health Centre attendees

Figure 2.1 Positivity rates of STI by region, the Netherlands, 2018



Footnote 1: STI includes: chlamydia, gonorrhoea, infectious syphilis, HIV and infectious hepatitis B.
 Footnote 2: GGD Gooi en Vechtstreek (grey striped region) does not have an SHC. Hence, no STI data were available for this region.
 Footnote 3: Aggregated data of non-registered consultations included.

Figure 2.2 Number of consultations and percentage of positive STI tests in the national STI surveillance in the Netherlands, 1995-2018



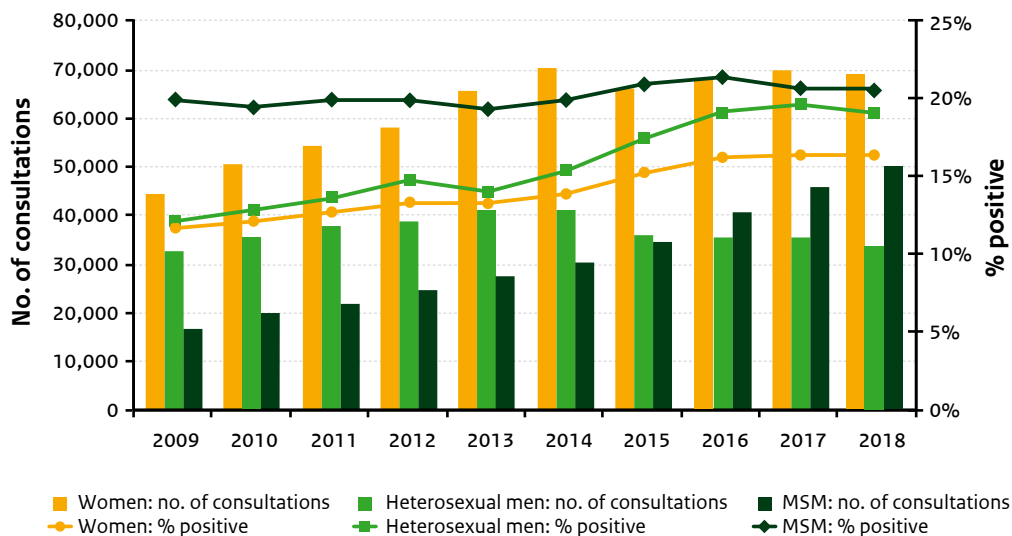
Footnote 1: 1995–2002: STI registration; 2000: STI clinic Erasmus Medical Centre Rotterdam was included; 2003: Implementation of STI sentinel surveillance network; 2004–2016: National STI surveillance network.
 Footnote 2: STI include: chlamydia, gonorrhoea, infectious syphilis, HIV and infectious hepatitis B.
 Footnote 3: Aggregated data of non-registered consultations included.

Table 2.1 Number of consultations by gender and type of sexual contact, 2014-2018

Gender and type of sexual contact	2014 n (%)	2015 n (%)	2016 n (%)	2017 n (%)	2018 n (%)
Women	70,219 (49.7)	65,991 (48.4)	67,600 (47.2)	69,375 (46.1)	68,710 (45.1)
Heterosexual men	40,856 (28.9)	35,719 (26.2)	35,065 (24.5)	35,242 (23.4)	33,041 (21.7)
MSM	29,939 (21.2)	34,442 (25.3)	40,340 (28.2)	45,553 (30.2)	49,873 (32.8)
Transgender*	59 (0.04)	50 (0.04)	56 (0.04)	416 (0.3)	484 (0.3)
Unknown*	118 (0.08)	145 (0.11)	78 (0.05)	7 (0.0)	109 (0.1)
Total	141,191	136,347	143,139	150,593	152,217

* Categories 'transgender' and 'unknown' are disregarded in the rest of the tables.
 Footnote: Aggregated data of non-registered consultations included.

Figure 2.3 Number of consultations and percentage of positive STI tests by gender and type of sexual contact, 2009-2018



Footnote 1: STI include: chlamydia, gonorrhoea, infectious syphilis, HIV and infectious hepatitis B.

Footnote 2: Aggregated data of non-registered consultations included.

Table 2.2 Number of consultations by age, gender and type of sexual contact, 2018

Age (years)	Women n (%)	Heterosexual men n (%)	MSM n (%)
≤ 19	7,317 (12.0)	2,119 (7.2)	933 (2.1)
20-24	35,923 (58.8)	16,081 (54.6)	6,148 (14.0)
25-29	10,222 (16.7)	6,638 (22.5)	8,231 (18.7)
30-34	2,892 (4.7)	2,230 (7.6)	6,430 (14.6)
35-39	1,532 (2.5)	984 (3.3)	4,831 (11.0)
40-44	958 (1.6)	473 (1.6)	4,188 (9.5)
45-49	947 (1.5)	376 (1.3)	4,025 (9.1)
50-54	767 (1.3)	246 (0.8)	3,791 (8.6)
≥ 55	562 (0.9)	307 (1.0)	5,433 (12.3)
Total	61,120	29,454	44,012

Figure 2.4 Percentage of positive STI tests by age, gender and type of sexual contact, 2018



Footnote: STI include: chlamydia, gonorrhoea, infectious syphilis, HIV and infectious hepatitis B.

Table 2.3 Number of consultations by ethnicity, generation, gender and type of sexual contact, 2018

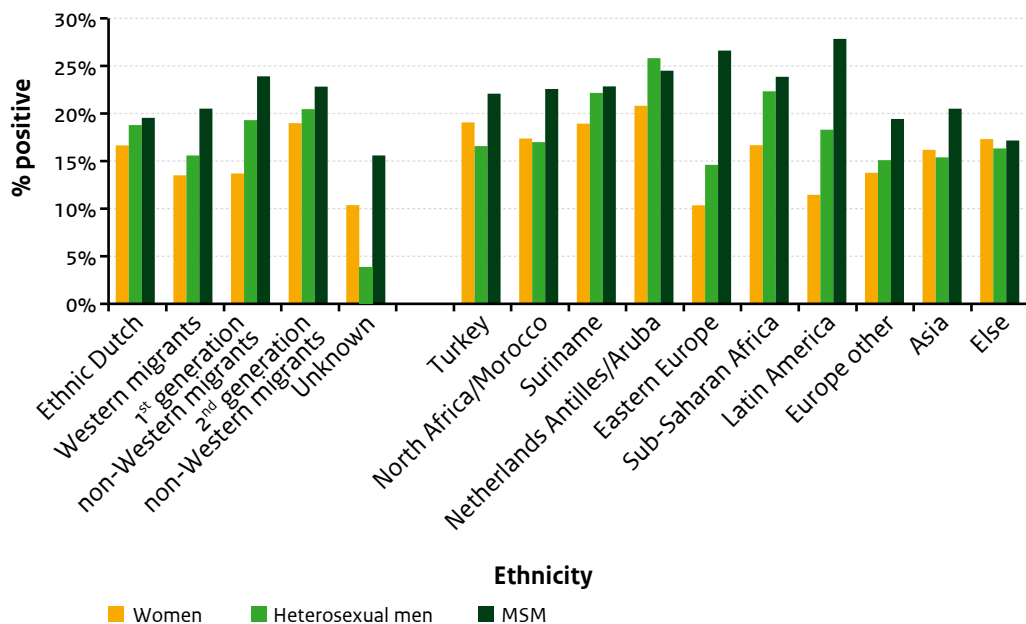
Ethnicity	Women n (%)	Heterosexual men n (%)	MSM n (%)
The Netherlands	44,110 (72.2)	18,414 (62.5)	29,662 (67.4)
Turkey	634 (1.0)	832 (2.8)	740 (1.7)
First generation	89 (14.0)	147 (17.7)	245 (33.1)
Second generation	545 (86.0)	685 (82.3)	495 (66.9)
North Africa/Morocco	978 (1.6)	1,287 (4.4)	642 (1.5)
First generation	98 (10.0)	220 (17.1)	261 (40.7)
Second generation	879 (89.9)	1,067 (82.9)	381 (59.3)
Suriname	2,617 (4.3)	2,134 (7.2)	1,268 (2.9)
First generation	537 (20.5)	534 (25.0)	523 (41.2)
Second generation	2,079 (79.4)	1,599 (74.9)	745 (58.8)
Netherlands Antilles/Aruba	1,466 (2.4)	1,131 (3.8)	985 (2.2)
First generation	611 (41.7)	589 (52.1)	747 (75.8)
Second generation	855 (58.3)	542 (47.9)	238 (24.2)

Table 2.3 (continued) Number of consultations by migration background, generation, gender and type of sexual contact, 2018

Ethnicity	Women n (%)	Heterosexual men n (%)	MSM n (%)
Eastern Europe	2,270 (3.7)	479 (1.6)	1,208 (2.7)
First generation	1,904 (83.9)	334 (69.7)	1111 (92.0)
Second generation	366 (16.1)	145 (30.3)	96 (7.9)
Sub-Saharan Africa	1,287 (2.1)	1,211 (4.1)	554 (1.3)
First generation	510 (39.6)	559 (46.2)	378 (68.2)
Second generation	775 (60.2)	652 (53.8)	175 (31.6)
Latin America	1,426 (2.3)	547 (1.9)	1,486 (3.4)
First generation	954 (66.9)	320 (58.5)	1,320 (88.8)
Second generation	470 (33.0)	227 (41.5)	166 (11.2)
Europe other	3,193 (5.2)	1,629 (5.5)	3,736 (8.5)
First generation	1,495 (46.8)	843 (51.7)	2,859 (76.5)
Second generation	1,698 (53.2)	786 (48.3)	872 (23.3)
Asia	2,450 (4.0)	1,493 (5.1)	3,028 (6.9)
First generation	961 (39.2)	736 (49.3)	1,896 (62.6)
Second generation	1,489 (60.8)	754 (50.5)	1,129 (37.3)
Else	647 (1.1)	275 (0.9)	675 (1.5)
First generation	269 (41.6)	124 (45.1)	578 (85.6)
Second generation	377 (58.3)	151 (54.9)	96 (14.2)
Unknown	42 (0.1)	22 (0.1)	28 (0.1)
Total	61,120	29,454	44,012

Footnote: The numbers of first and second generation migrants do not always add up to 100%. The generation of the remaining group is unknown.

Figure 2.5 Percentage of positive STI tests by ethnicity (left side: aggregated data; right side: region of origin of non-Western migrants), gender and type of sexual contact, 2018



Footnote: STI includes: chlamydia, gonorrhoea, infectious syphilis, HIV and infectious hepatitis B.

Table 2.4 Reported triage indication by gender and type of sexual contact, 2018

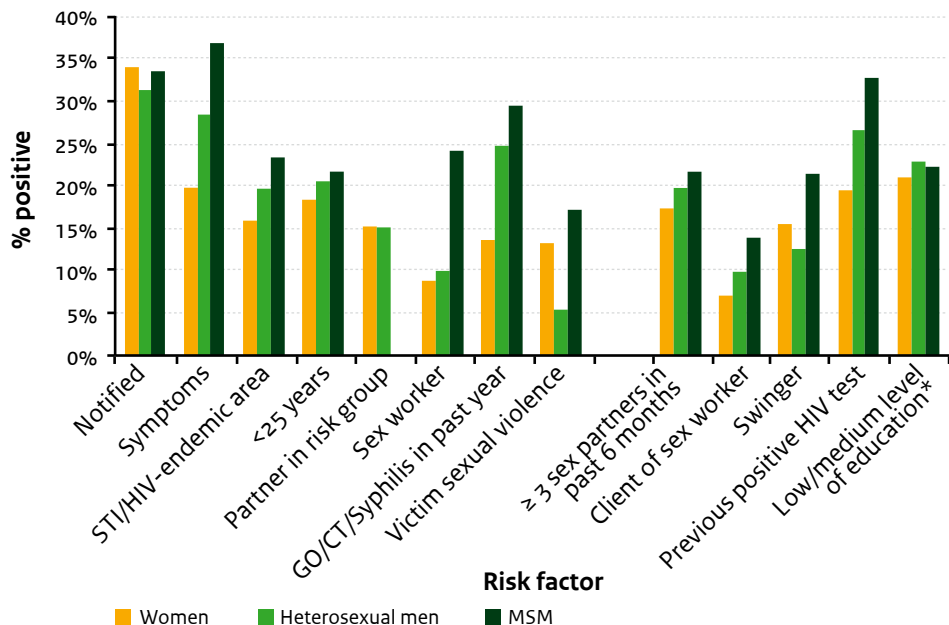
	Women n (%)	Heterosexual men n (%)	MSM n (%)
Notified			
No	50,810 (83.1)	21,379 (72.6)	35,850 (81.5)
Yes	9,826 (16.1)	7,938 (27.0)	8,109 (18.4)
Unknown	484 (0.8)	137 (0.5)	53 (0.1)
Symptoms			
No	42,579 (69.7)	20,130 (68.3)	36,034 (81.9)
Yes	18,293 (29.9)	9,244 (31.4)	7,921 (18.0)
Unknown	248 (0.4)	80 (0.3)	57 (0.1)
STI/HIV-endemic area			
No	47,992 (78.5)	20,340 (69.1)	34,101 (77.5)
Yes	13,128 (21.5)	9,114 (30.9)	9,911 (22.5)

Table 2.4 (continued) Reported triage indication by gender and type of sexual contact, 2018

	Women n (%)	Heterosexual men n (%)	MSM n (%)
<25 years			
No	17,880 (29.3)	11,254 (38.2)	36,931 (83.9)
Yes	43,240 (70.7)	18,200 (61.8)	7,081 (16.1)
Partner in risk group*			
No	43,029 (70.4)	20,369 (69.2)	27,836 (63.2)
Yes	16,976 (27.8)	8,833 (30.0)	15,421 (35.0)
Unknown	1,115 (1.8)	252 (0.9)	755 (1.7)
Sex worker			
No	54,926 (89.9)	28,771 (97.7)	42,914 (97.5)
Yes, in past 6 months	5,228 (8.6)	162 (0.6)	780 (1.8)
Unknown	966 (1.6)	521 (1.8)	318 (0.7)
Gonorrhoea/chlamydia/syphilis in past year			
Not tested	37,101 (60.7)	21,698 (73.7)	13,392 (30.4)
Tested, negative	16,168 (26.5)	4,912 (16.7)	17,511 (39.8)
Tested, positive	7,231 (11.8)	2,613 (8.9)	11,307 (25.7)
Tested, unknown	118 (0.2)	43 (0.1)	276 (0.6)
Unknown	502 (0.8)	188 (0.6)	1,526 (3.5)
Victim sexual violence			
No	58,721 (96.1)	28,964 (98.3)	38,388 (87.2)
Yes	1,105 (1.8)	37 (0.1)	163 (0.4)
Unknown	619 (1.0)	166 (0.6)	4,716 (10.7)
At least one indication (including MSM)			
No	2,476 (4.1)	1,176 (4.0)	0 (0.0)
Yes	58,644 (95.9)	28,278 (96.0)	44,012 (100.0)

* For heterosexual men and MSM: partner originating from a high STI/HIV endemic country.
For women: partner originating from a high STI/HIV endemic country or a male partner who had sex with men.

Figure 2.6 Percentage of positive STI tests by risk factor, gender and type of sexual contact, 2018



* Low/medium level of education: no education, elementary school, lbo, mavo, vmbo, mbo.
Footnote: STI include: chlamydia, gonorrhoea, infectious syphilis, HIV and infectious hepatitis B.

Table 2.5 Number of consultations by demographics, (sexual) behavioural characteristics, gender and type of sexual contact, 2018

	Women n (%)	Heterosexual men n (%)	MSM n (%)
Socioeconomic status			
High	17,852 (29.2)	8,200 (27.8)	13,512 (30.7)
Medium	15,508 (25.4)	7,139 (24.2)	10,652 (24.2)
Low	24,565 (40.2)	13,362 (45.4)	18,316 (41.6)
Unknown	3,195 (5.2)	753 (2.6)	1,532 (3.5)
Educational level*			
High	39,254 (64.2)	18,057 (61.3)	28,849 (65.5)
Low/medium	18,170 (29.7)	10,159 (34.5)	11,970 (27.2)
Unknown	3,696 (6.0)	1,238 (4.2)	3,193 (7.3)

Table 2.5 (continued) Number of consultations by demographics, (sexual) behavioural characteristics, gender and type of sexual contact, 2018

	Women n (%)	Heterosexual men n (%)	MSM n (%)
Number of partners in past 6 months			
0 partners	509 (0.8)	224 (0.8)	396 (0.9)
1 partner	16,102 (26.3)	5,378 (18.3)	3,384 (7.7)
2 partners	15,686 (25.7)	6,064 (20.6)	4,413 (10.0)
3 or more partners	26,597 (43.5)	17,592 (59.7)	35,079 (79.7)
Unknown	2,226 (3.6)	196 (0.7)	740 (1.7)
Receptive anal sex, in past 6 months			
No receptive anal sex	46,568 (76.3)		11,267 (25.6)
Yes, consistently with a condom	1,546 (2.5)		7,689 (17.5)
Yes, not consistently with a condom	10,556 (17.3)		23,153 (52.6)
Unknown	2,368 (3.9)		1,887 (4.3)
Insertive anal sex, in past 6 months			
No insertive anal sex		21,969 (74.7)	8,068 (18.3)
Yes, consistently with a condom		602 (2.0)	8,571 (19.5)
Yes, not consistently with a condom		3,121 (10.6)	25,537 (58.0)
Unknown		3,729 (12.7)	1,820 (4.1)
Vaginal sex, in past 6 months**			
No vaginal sex	572 (0.9)	296 (1.0)	817 (12.0)
Yes, consistently with a condom	4,550 (7.5)	2,009 (6.8)	945 (13.9)
Yes, not consistently with a condom	54,288 (88.9)	26,422 (89.8)	4,200 (61.8)
Unknown	1,628 (2.7)	691 (2.3)	832 (12.2)
Receptive oral sex, in past 6 months			
No receptive oral sex	7,000 (11.5)		2,096 (4.8)
Yes, consistently with a condom	1,332 (2.2)		446 (1.0)
Yes, not consistently with a condom	48,959 (80.2)		38,933 (88.5)
Unknown	3,747 (6.1)		2,521 (5.7)
Client of sex worker			
No	49,843 (81.5)	26,804 (91.0)	42,295 (96.1)
Yes, in past 6 months	143 (0.2)	2,088 (7.1)	1,369 (3.1)
Unknown	11,134 (18.2)	562 (1.9)	348 (0.8)

Table 2.5 (continued) Number of consultations by demographics, (sexual) behavioural characteristics, gender and type of sexual contact, 2018

	Women n (%)	Heterosexual men n (%)	MSM n (%)
Swinger #			
No	29,469 (82.3)	14,903 (85.4)	21,011 (67.8)
Yes	1,196 (3.3)	368 (2.1)	2,319 (7.5)
Unknown	5,131 (14.3)	2,178 (12.5)	7,653 (24.7)
Previous HIV test			
No	41,579 (68.0)	20,185 (68.5)	4,932 (11.2)
Yes, positive	36 (0.1)	15 (0.1)	4,779 (10.9)
Yes, negative	17,806 (29.1)	8,382 (28.5)	34,064 (77.4)
Yes, result unknown	104 (0.2)	24 (0.1)	55 (0.1)
Unknown	1,595 (2.6)	848 (2.9)	182 (0.4)

* Low/medium level of education: no education, elementary school, lbo, mavo, vmbo, mbo;
high level of education: havo, vwo, university of applied sciences, university.

** For MSM: numbers are reported for men who had sex with both men and women (N=6,735).
Men who had sex with men only are excluded.

Voluntary question, answered by 51% (n=69,266).

Table 2.6 Number of consultations and percentage of positive tests among MSM by (sexual) behavioural characteristics, PrEP use and supply, 2018

	MSM	
	n (%)	% STI
Anal sex in past 6 months		
No	3,204 (7.3)	9.0
Receptive only	4,766 (10.8)	19.6
Insertive only	7,962 (18.1)	16.1
Both insertive and receptive	26,023 (59.1)	23.7
Unknown	2,057 (4.7)	16.1
Group sex		
No	15,356 (34.9)	18.1
Yes	6,825 (15.5)	26.3
Unknown	21,831 (49.6)	20.3

Table 2.6 (continued) Number of consultations and percentage of positive tests among MSM by (sexual) behavioural characteristics, PrEP use and supply, 2018

	MSM	
	n (%)	% STI
Sex with HIV-positive MSM		
No	9,339 (21.2)	18.1
Yes	3,671 (8.3)	29.0
Don't known	9,525 (21.6)	19.4
Unknown	21,477 (48.8)	20.5
Drug use in relation to sex, in past 6 months*		
No	37,179 (84.5)	18.9
Yes	6,833 (15.5)	28.8
Injected/slammed drugs in past 6 months		
No	9,922 (22.5)	23.5
Yes	149 (0.3)	35.6
Unknown	33,941 (77.1)	19.5
PrEP use		
No PrEP use	21,348 (48.5)	17.6
Yes, in past 6 months	1,849 (4.2)	29.2
Yes, more than 6 months ago	124 (0.3)	28.2
Unknown	20,691 (47.0)	22.6
PrEP supply**		
Dutch health care provider	1,446 (73.3)	29.2
Unofficial route (informal use)	373 (18.9)	30.6
PEP treatment	38 (1.9)	15.6
Unknown route	139 (7.0)	26.6

* Included drugs are cocaine, XTC/MDMA/ Speed, Heroin, Crystal Meth, Mephedrone, 3-MMC, 4-MEC, 4-FA, GHB/GBL and ketamine.

** Numbers reported for MSM whom reported PrEP use. Percentages do not add up to 100%, as proportions per category can overlap.

Footnote: STI include: chlamydia, gonorrhoea, infectious syphilis, HIV and infectious hepatitis B.

Table 2.7 Number of consultations and percentage of positive tests by age, level of education, gender and type of sexual contact, 2018

Age group (years)	Women		Heterosexual men		MSM	
	Low / medium level of education*	High level of education**	Low/ medium level of education*	High level of education**	Low/ medium level of education*	High level of education**
	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)
≤ 19	3,528 (29.3)	3,585 (21.3)	1,199 (27.4)	863 (20.6)	436 (26.8)	462 (19.0)
20-24	9,223 (21.8)	25,789 (15.4)	5,129 (24.8)	10,533 (18.0)	1,810 (25.7)	4,056 (19.7)
25-34	3,516 (16.1)	8,401 (10.6)	2,920 (21.0)	5,524 (15.6)	3,553 (24.7)	10,105 (20.1)
≥35	1,903 (10.5)	1,479 (10.6)	911 (12.2)	1,137 (9.8)	6,171 (19.8)	14,225 (19.2)
Total	18,170 (21.0)	39,254 (14.7)	10,159 (22.9)	18,057 (16.9)	11,970 (22.4)	28,849 (19.6)

* Low/medium level of education: no education, elementary school, lbo, mavo, vmbo, mbo.

** High level of education: havo, vwo, university of applied sciences, university.

Footnote: level of education, gender and type of sexual contact was missing for 6% (n=8,127).

Table 2.8a Number of 'big five' STI diagnoses and percentage of positive tests by gender and type of sexual contact, 2018

Diagnosis	Women n (% pos.)	Heterosexual men n (% pos.)	MSM n (% pos.)
Chlamydia	10,315 (15.0)	5,851 (17.7)	4,855 (9.8)
Gonorrhoea	1,159 (1.7)	646 (2.0)	5,557 (11.2)
Syphilis, infectious*	22 (0.1)	26 (0.2)	1,176 (2.4)
HIV	14 (0.0)	11 (0.1)	224 (0.5)
Hepatitis B, infectious	22 (0.3)	28 (0.6)	24 (0.3)

* Infectious syphilis includes primary infection, secondary infection and latens recens.

Footnote 1: 'Big five' STI includes chlamydia, gonorrhoea, syphilis, HIV and hepatitis B.

Footnote 2: Aggregated data of non-registered consultations included for chlamydia, gonorrhoea, syphilis and HIV.

Table 2.8b Number of other STI diagnoses and percentage of positive tests (in case of laboratory-confirmed diagnoses) by gender and type of sexual contact, 2018

Laboratory-confirmed diagnoses	Women	Heterosexual men	MSM
Syphilis, non-infectious or not specified			
latens tarda	15 (0.1)	9 (0.1)	136 (0.3)
not specified	15 (0.1)	4 (0.0)	107 (0.2)
Hepatitis B, recovered	165 (2.4)	127 (2.8)	366 (3.9)
Hepatitis C	1 (2.1)	0 (0.0)	37 (0.9)
<i>Lymphogranuloma venereum</i>			278 (8.3)
Other syndromes/clinical diagnoses			
Trichomoniasis*	63	10	4
Genital herpes			
primary: HSV1**	79	48	53
primary: HSV2**	72	57	68
primary: HSV unknown	21	8	3
recurrent	8	3	6
Genital warts	437	583	294
Non-specified urethritis	4	705	554
Proctitis	3	1	167
Candidiasis	346	63	35
Bacterial vaginosis	848	0	0
Scabies	2	9	16
Pubic Lice	0	1	5
Ulcus e.c.i.	5	3	20

* Trichomoniasis tests are usually performed on clinical indication (e.g. women with bacterial vaginosis), and in persons notified for trichomoniasis.

** Laboratory-confirmed.

Footnote: Aggregated data of non-registered consultations included for syphilis and lymphogranuloma venereum.

2.3 Repeated testing at the Sexual Health Centres

Table 2.9 Number and percentage of unique clients visiting the SHC repeatedly and the percentage of positive STI tests at each visit by gender and type of sexual contact, 2018

No. of consultation	Women		Heterosexual men		MSM	
	n (%)	% STI	n (%)	% STI	n (%)	% STI
1 st	54,456 (100.0)	16.5	27,284 (100.0)	18.7	29,531 (100.0)	19.2
2 nd	5,710 (10.5)	15.5	1,943 (7.1)	20.8	9,833 (33.3)	20.8
3 rd	783 (1.4)	11.1	210 (0.8)	21.9	3,245 (11.0)	26.1
4 th	141 (0.3)	12.8	16 (0.1)	12.5	1,014 (3.4)	28.9

Footnote: Number of visits reach up to 9 in MSM, 7 in women and 5 in heterosexual men. 5th-11th consultation not shown because of low numbers.

Table 2.10 Characteristics of unique clients at each consultation by, gender and type of sexual contact, 2018

	Women n (%)	Heterosexual men n (%)	MSM n (%)
Notified for STI/HIV			
1 st	8,790 (16.1)	7,306 (26.8)	5,297 (17.9)
2 nd	929 (16.3)	567 (29.2)	1,809 (18.4)
3 rd	93 (11.9)	54 (25.7)	684 (21.1)
STI-related symptoms			
1 st	16,081 (29.5)	8,396 (30.8)	5,258 (17.8)
2 nd	1,926 (33.7)	748 (38.5)	1,711 (17.4)
3 rd	234 (29.9)	92 (43.8)	675 (20.8)
STI/HIV-endemic area			
1 st	11,141 (20.5)	8,254 (30.3)	6,603 (22.4)
2 nd	1,625 (28.5)	750 (38.6)	2,232 (22.7)
3 rd	292 (37.3)	101 (48.1)	773 (23.8)
Age <25 years			
1 st	39,156 (71.9)	16,883 (61.9)	5,245 (17.8)
2 nd	3,651 (63.9)	1,177 (60.6)	1,355 (13.8)
3 rd	375 (47.9)	129 (61.4)	347 (10.7)

Table 2.10 (continued) Characteristics of unique clients at each consultation by gender and type of sexual contact, 2018

	Women n (%)	Heterosexual men n (%)	MSM n (%)
Partner in risk group*			
1 st	14,428 (26.5)	8,055 (29.5)	10,011 (33.9)
2 nd	2,117 (37.1)	683 (35.2)	3,546 (36.1)
3 rd	360 (46.0)	88 (41.9)	1,293 (39.8)
Sex worker			
1 st	3,581 (6.6)	129 (0.5)	500 (1.7)
2 nd	1,167 (20.4)	26 (1.3)	172 (1.7)
3 rd	356 (45.5)	6 (2.9)	75 (2.3)
Gonorrhoea/chlamydia/syphilis in past year			
1 st	5,246 (9.6)	1,844 (6.8)	5,202 (17.6)
2 nd	1,623 (28.4)	650 (33.5)	3,517 (35.8)
3 rd	295 (37.7)	108 (51.4)	1,661 (51.2)
≥3 sexual contacts in the past 6 months			
1 st	23,374 (42.9)	16,170 (59.3)	22,858 (77.4)
2 nd	2,765 (48.4)	1,289 (66.3)	8,173 (83.1)
3 rd	376 (48.0)	126 (60.0)	2,797 (86.2)
Client of sex worker			
1 st	119 (0.2)	1,926 (7.1)	1,013 (3.4)
2 nd	17 (0.3)	147 (7.6)	257 (2.6)
3 rd	7 (0.9)	14 (6.7)	67 (2.1)
Known HIV positive			
1 st	30 (0.1)	13 (0.0)	2,809 (9.5)
2 nd	5 (0.1)	1 (0.1)	1,251 (12.7)
3 rd	1 (0.1)	1 (0.5)	504 (15.5)
Low/medium level of education**			
1 st	15,703 (28.8)	9,318 (34.2)	8,104 (27.4)
2 nd	2,049 (35.9)	747 (38.4)	2,674 (27.2)
3 rd	339 (43.3)	86 (41.0)	867 (26.7)

* For heterosexual men and MSM: partner originating from a high STI/HIV endemic country.

For women: partner originating from a high STI/HIV endemic country or a male partner who had sex with men.

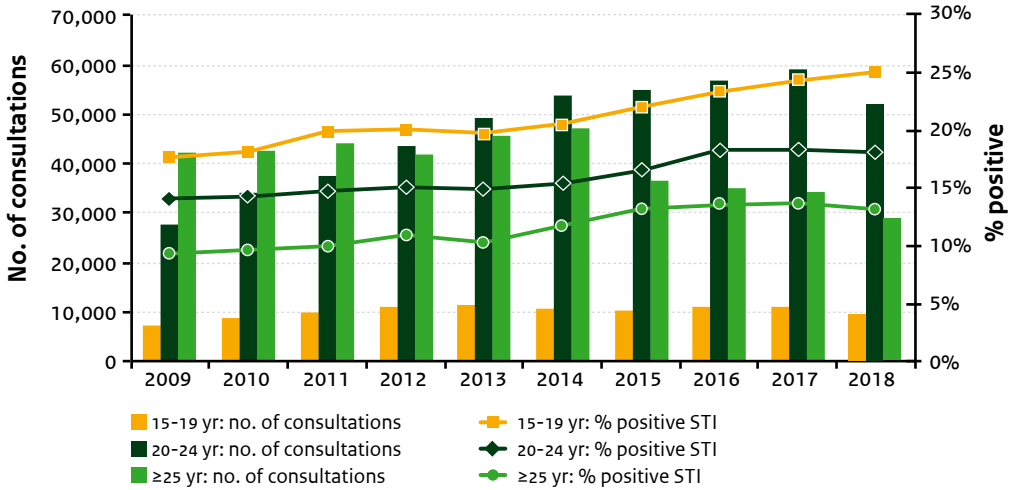
** Low/medium level of education: no education, elementary school, lbo, mavo, vmbo, mbo.

Footnote: Number of visits reach up to 9 in MSM, 7 in women and 5 in heterosexual men. 5th-11th consultation not shown because of low numbers.

2.4 Trends in Sexual Health Centre consultations

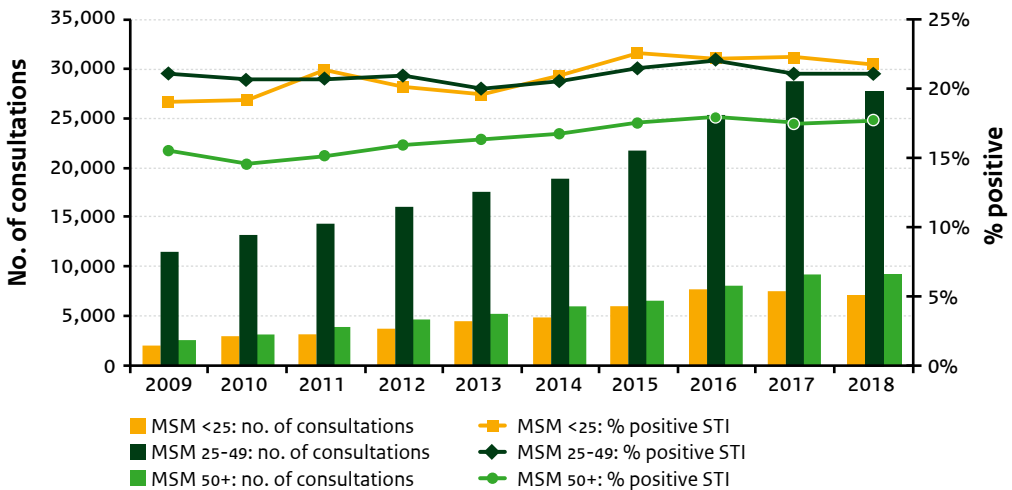
2.4.1 Trends in specific risk groups

Figure 2.7 Number of consultations and percentage of positive STI tests among women and heterosexual men by age group, 2009-2018



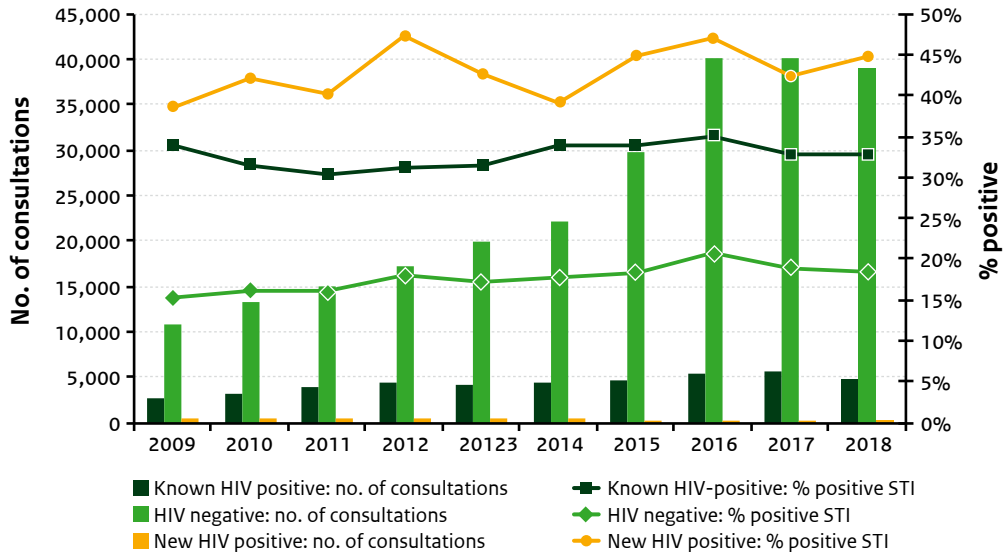
Footnote: STI includes: chlamydia, gonorrhoea, infectious syphilis, HIV and infectious hepatitis B.

Figure 2.8 Number of consultations and percentage of positive STI tests among MSM by age group, 2009-2018



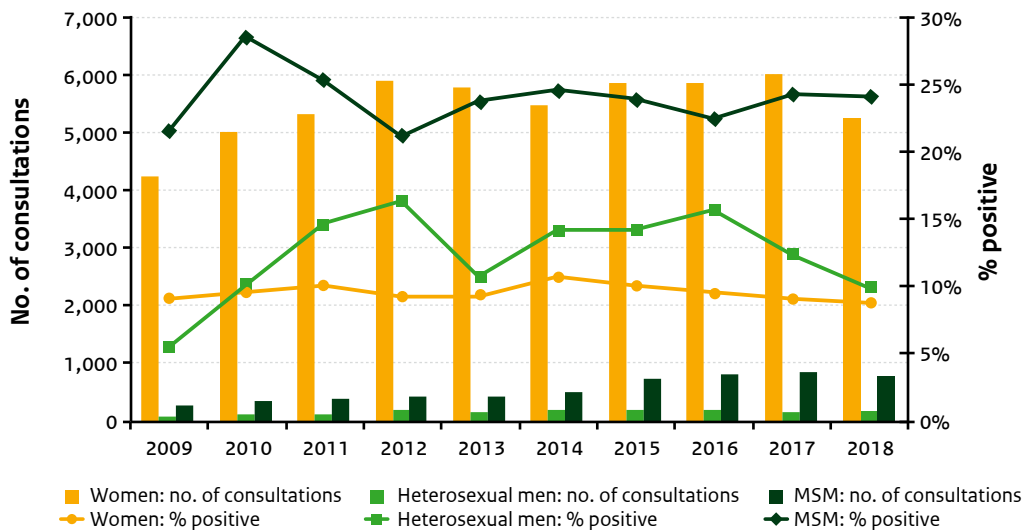
Footnote: STI includes: chlamydia, gonorrhoea, infectious syphilis, HIV and infectious hepatitis B.

Figure 2.9 Number of consultations and percentage of positive STI tests among MSM by HIV status, 2009-2018



Footnote: STI includes: chlamydia, gonorrhoea, infectious syphilis, HIV and infectious hepatitis B.

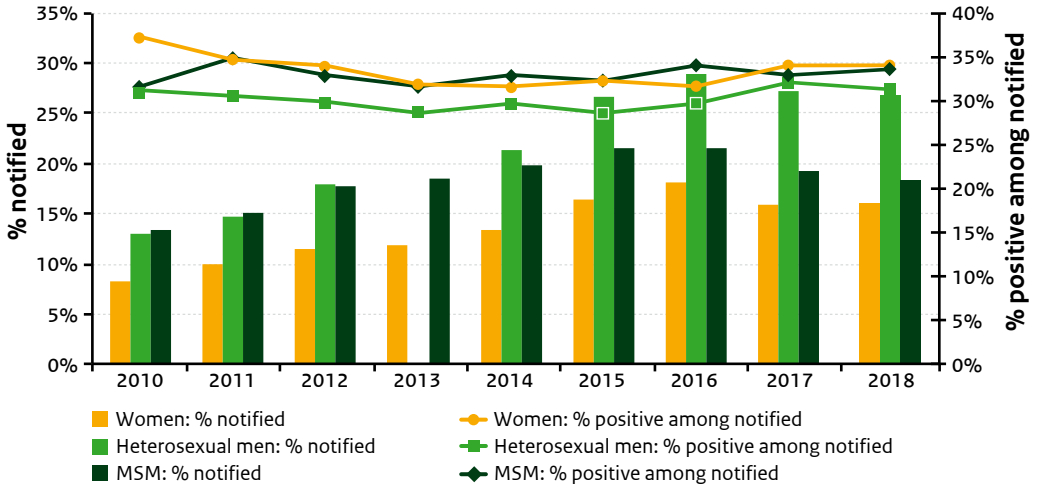
Figure 2.10 Number of consultations and percentage of positive STI tests among sex workers by gender and type of sexual contact, 2009-2018



Footnote: STI includes: chlamydia, gonorrhoea, infectious syphilis, HIV and infectious hepatitis B.

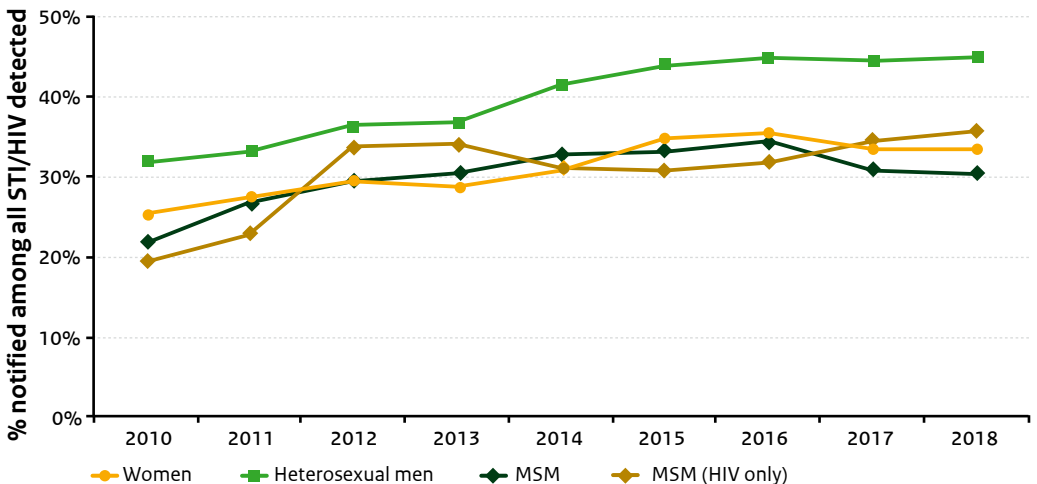
2.4.2 Partner notification trends

Figure 2.11 Percentage of SHC clients who reported being notified for potential risk of exposure to STI and the STI positivity rate among notified clients by gender and type of sexual contact, 2010-2018



Footnote: STI includes chlamydia, gonorrhoea, infectious syphilis, HIV, and infectious hepatitis B.

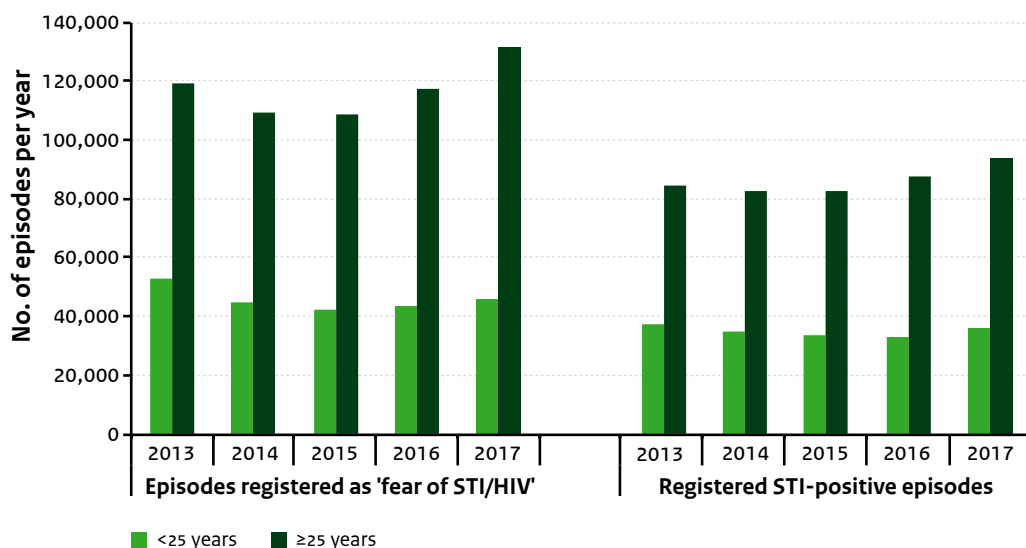
Figure 2.12 Percentage of STI detected through partner notification among heterosexual men, MSM and women, and percentage of HIV detected through partner notification among MSM, 2010-2018



Footnote: STI includes chlamydia, gonorrhoea, infectious syphilis, HIV, and infectious hepatitis B.

2.5 General practice

Figure 2.13 Estimated annual number of recorded episodes of fear of STI/HIV and positive STI diagnoses at GPs by age-group, based on extrapolation from GP practices in Nivel-PCD, 2013-2017



Footnote 1: Diagnoses included are chlamydia, gonorrhoea, syphilis, HIV, trichomonas, genital herpes, genital warts, non-specific urethritis.

Footnote 2: About 70% of the total Dutch population consists of persons aged ≥ 25 years and about 30% consists of persons aged < 25 years.

Table 2.11 Annual reporting rate (number of STI-related episodes per 1,000 population) of STI-diagnoses and fear of STI/HIV at GPs in the Netherlands by gender and age group, based on GP practices in Nivel-PCD, 2013-2017

	Women n/1,000			Men n/1,000			Total n/1,000		
	All	<25	≥ 25	All	<25	≥ 25	All	<25	≥ 25
2013	18.7	23.9	16.5	16.3	13.1	17.8	17.5	18.5	17.2
2014	16.9	20.8	15.4	15.2	12.0	16.7	16.1	16.4	16.1
2015	16.1	19.6	15.0	15.3	11.7	16.9	15.7	15.7	15.9
2016	16.9	19.8	15.9	16.2	11.8	18.0	16.5	15.8	16.9
2017	19.1	21.1	18.2	17.0	12.6	18.8	18.0	16.9	18.5

Footnote: Diagnoses included are chlamydia, gonorrhoea, syphilis, HIV, trichomonas, genital herpes, genital warts, non-specific urethritis.

Table 2.12 Characteristics of STI-patients seen in primary care surveillance (based on STI-consultation questionnaires in 40-45 sentinel practices of Nivel-PCD), from 2014-2018

	2014 n (%)	2015 n (%)	2016 n (%)	2017 n (%)	2018 n (%)
Gender and sexual preference					
Women	324 (55)	268 (57)	232 (53)	307 (56)	297 (55)
Heterosexual men	210 (35)	151 (32)	156 (36)	177 (32)	169 (31)
MSM	33 (6)	21 (4)	31 (7)	33 (6)	41 (8)
Men, unknown preference	22 (4)	30 (6)	18 (4)	29 (5)	35 (6)
Migration background					
Dutch	498 (84)	390 (83)	374 (86)	465 (85)	449 (83)
Non-Dutch non-Western	78 (13)	64 (14)	43 (10)	62 (11)	64 (12)
Non-Dutch Western	4 (1)	10 (2)	10 (2)	6 (1)	10 (2)
Unknown	12 (2)	6 (1)	10 (2)	13 (2)	19 (4)
Age group					
< 25 years	198 (33)	169 (36)	149 (34)	167 (31)	220 (41)
≥ 25 years	393 (66)	301 (64)	288 (66)	379 (69)	322 (59)
Recent sexual contacts*					
Steady partner	247 (42)	197 (42)	171 (39)	242 (44)	207 (38)
Casual partner(s)	231 (39)	186 (40)	161 (37)	206 (38)	234 (43)
Paid sex contacts	10 (2)	6 (1)	1 (0)	8 (1)	5 (1)
Unknown	104 (18)	81 (17)	104 (24)	108 (20)	120 (22)
Reason for STI-consultation					
STI-related complaints	368 (62)	248 (53)	331 (76)	311 (57)	318 (59)
Notified	76 (13)	3 (1)	4 (1)	107 (20)	89 (16)
Check-up	41 (7)	20 (4)	26 (6)	36 (7)	35 (6)
Recent risk	47 (8)	33 (7)	31 (7)	38 (7)	47 (9)
Fear for STI	14 (2)	3 (1)	3 (1)	4 (1)	8 (1)
Other/unknown	46 (8)	163 (35)	42 (10)	50 (9)	45 (8)
Total	592	470	437	546	542

* Some patients are included in more than one category, as multiple answers were possible.

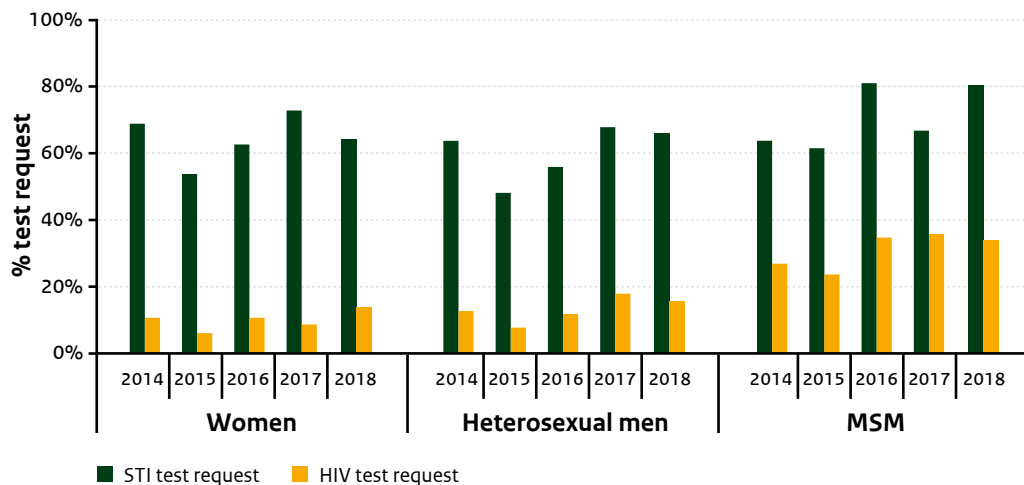
Table 2.13 Testing rate and positivity rate for STI (chlamydia, gonorrhoea, syphilis, hepatitis B) and HIV during STI-related consultations in the Sentinel Practices of Nivel-PCD, 2018

	STI test		HIV test*
	n tests (% tested)	n pos (% pos)	n tests (% tested)
Gender and sexual preference			
Women	191 (64)	91 (48)	42 (14)
Heterosexual men	112 (66)	63 (56)	27 (16)
MSM	33 (80)	20 (61)	14 (34)
Men, unknown preference	19 (54)	14 (74)	5 (14)
Migration background			
Dutch	297 (66)	156 (53)	69 (15)
Non-Dutch non-Western	44 (69)	26 (59)	14 (22)
Non-Dutch Western	5 (50)	1 (20)	1 (10)
Unknown	9 (47)	5 (56)	4 (21)
Age group			
< 25 years	156 (71)	91 (58)	31 (14)
≥ 25 years	199 (62)	97 (49)	57 (18)
Recent sexual contacts**			
Steady partner	115 (56)	53 (46)	19 (9)
Casual partner(s)	190 (81)	111 (58)	62 (27)
Paid sex contacts	4 (80)	2 (50)	1 (20)
Unknown	65 (54)	34 (52)	11 (9)
Reason for STI-consultation			
STI-related complaints	191 (60)	106 (55)	42 (13)
Notified	61 (69)	42 (69)	13 (15)
Check-up	33 (94)	14 (42)	11 (31)
Recent risk	45 (96)	18 (40)	11 (23)
Fear for STI	8 (100)	0 (0)	3 (38)
Other/unknown	17 (38)	8 (47)	8 (18)
Total	355 (65)	188 (53)	88 (16)

* One HIV-tests was positive.

** Some patients are included in more than one category, as multiple answers were possible.

Figure 2.14 Testing rate for STI (chlamydia, gonorrhoea, syphilis, HepB) and HIV during STI-related consultations in the Sentinel Practices of Nivel-PCD, 2014-2018



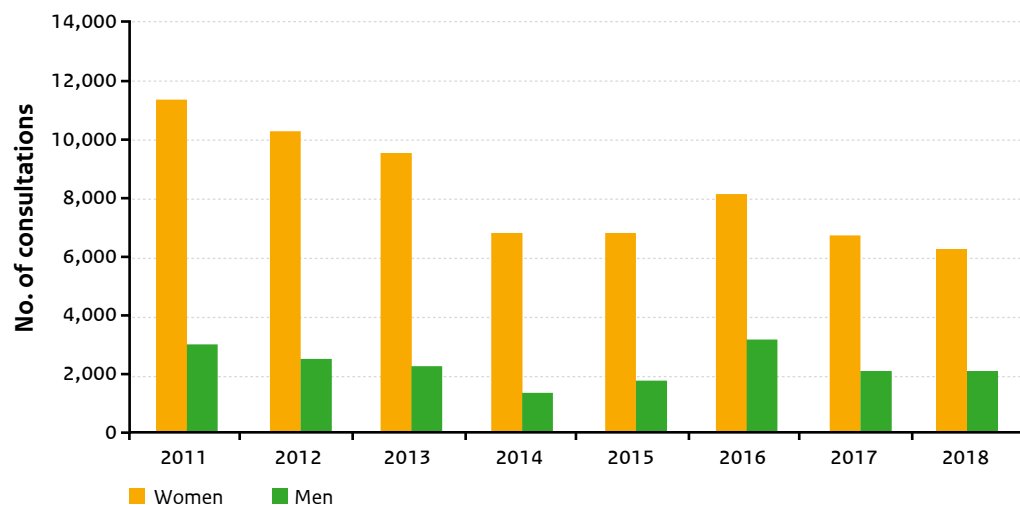
2.6 Sense

Table 2.14 Number of Sense consultations by age and gender, 2018

Age (years)	Women n (%)	Men n (%)
≤ 14	783 (12.6)	123 (6.1)
15-19	3,742 (60.4)	1,057 (52.0)
20-24	1,294 (20.9)	487 (24.0)
≥ 25	380 (6.1)	364 (17.9)
Total	6,199	2,031

Footnote: Transgenders were excluded from the analyses.

Figure 2.15 Number of Sense consultations by gender, 2011-2018



Footnote: Transgenders were excluded from the analyses.

Table 2.15 Number of Sense consultations by country of birth and gender, 2018

Country of birth	Women n (%)	Men n (%)
The Netherlands	3,927 (63.3)	1,286 (63.3)
Netherlands Antilles	216 (3.5)	55 (2.7)
Suriname	349 (5.6)	113 (5.6)
Noth Africa/Morocco	149 (2.4)	55 (2.7)
Turkey	98 (1.6)	60 (3.0)
Eastern Europe	279 (4.5)	41 (2.0)
Sub-Saharan Africa	247 (4.0)	75 (3.7)
Latin America	174 (2.8)	41 (2.0)
Asia	280 (4.5)	128 (6.3)
Else	480 (7.7)	176 (8.7)
Total	6,199	2,030

Footnote: Transgenders were excluded from the analyses.

Table 2.16 Subjects discussed during Sense consultations by gender, 2018

Subjects	Women n (%)	Men n (%)
STI	585 (8.4)	388 (18.1)
Sexuality	1,835 (26.5)	1,178 (55.0)
Birth control	2,888 (41.6)	13 (0.6)
Unwanted sexual behaviour/sexual violence	497 (7.2)	69 (3.2)
Unintended pregnancy	589 (8.5)	4 (0.2)
Else	542 (7.8)	488 (22.8)
Total	6,936	2,140

Footnote: Transgenders were excluded from analyses. Numbers do not add up to total number of consultations, as for some consultations multiple topics were registered.

Table 2.17 Sexuality topics discussed during Sense consultations by gender, 2018

Questions/problems related to:	Women n (%)	Men n (%)
Human body	173 (9.2)	68 (5.6)
Sexual dysfunction	899 (47.9)	403 (33.4)
Sexual orientation	17 (0.9)	77 (6.4)
Gender identity	2 (0.1)	4 (0.3)
Sexual behaviour/sex techniques	553 (29.5)	480 (39.7)
Unknown/other	233 (12.4)	176 (14.6)
Total	1,877	1,208

Footnote: Transgenders were excluded from analyses. Numbers do not add up to total number of sexuality topics in Table 2.15, as for some consultations multiple sexuality topics were registered.

2.7 Sexual Health in the Health Survey

Table 2.18 Characteristics of respondents to the national Health Survey 2017, by gender and sexual orientation*

	Women	Heterosexual men	Men attracted to men*
	n %	n %	n %
Age group			
16-29 years	740 (18.4)	599 (17.7)	
30-44 years	805 (20.0)	702 (20.7)	
45-59 years	1,053 (26.2)	910 (26.8)	
60 years and older	1,424 (35.4)	1,180 (34.8)	
Migration background			
Dutch	3,297 (82.0)	2,868 (84.6)	
Non-Dutch Western	407 (10.1)	287 (8.5)	
Non-Dutch non-Western	318 (7.9)	236 (7.0)	
Urbanisation			
(Highly) urbanized areas	2,046 (50.9)	1,674 (49.4)	
Moderately urbanized area	721 (17.9)	622 (18.3)	
Less/non-urbanized areas	1,255 (31.2)	1,095 (32.3)	
Total	4,022 (53.1)	3,391 (44.8)	160 (2.1)

Source: Health Survey/Lifestyle Monitor, CBS in collaboration with RIVM, Rutgers, and Soa Aids Nederland, 2017.

* The questionnaire scored respondents' sexual attraction as own sex, opposite sex or both; we included men attracted to men or men attracted to both sexes in the category 'Men attracted to men'. No subcategories are shown for 'Men attracted to men' due to low numbers (n≤100).

Table 2.19 Weighted prevalence of sexual behaviour of respondents to the national Health Survey 2017, by age, gender and sexual orientation

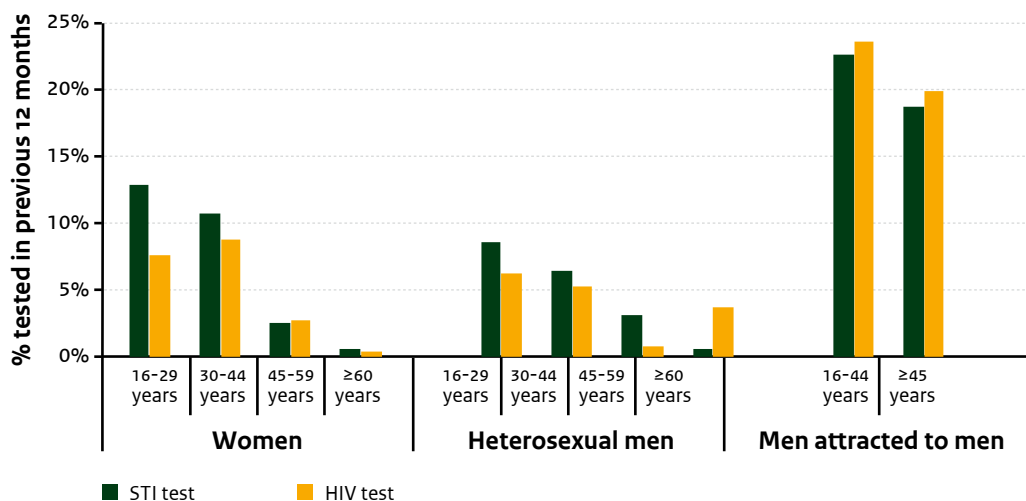
	Women	Heterosexual men	Men attracted to men*
	%	%	%
Two or more sex partners in the past 12 months	5.4	8.4	29.7
16-29 years	15.2	20.5	
30-44 years	5.1	8.0	
45-59 years	2.3	4.8	
60 years and older	0.4	2.2	
Last sexual contact with a casual partner	3.3	6.9	13.4
16-29 years	9.3	17.1	
30-44 years	2.9	6.0	
45-59 years	2.4	4.9	
60 years and older	0.4	1.6	
Last sexual contact with a steady partner	55.5	62.8	53.8
16-29 years	56.3	45.9	
30-44 years	79.7	77.3	
45-59 years	64.5	75.1	
60 years and older	29.9	52.1	
Condom use at last sexual contact if contact was casual	48.1	51.7	
16-29 years	53.2	53.8	
30-44 years	50.0	58.0	
45-59 years	34.6	46.8	
60 years and older	25.0	26.7	

Source: Health Survey/Lifestyle Monitor, CBS in collaboration with RIVM, Rutgers, and Soa Aids Nederland, 2017.

* The questionnaire scored respondents' sexual attraction as own sex, opposite sex or both; we included men attracted to men or men attracted to both sexes in the category 'Men attracted to men'. No subcategories are shown for 'Men attracted to men' due to low numbers (n≤100).

Footnote: Respondents were weighted for demographic characteristics to correct for differences between the sample and the total Dutch population.

Figure 2.16 Weighted percentage tested for STI and HIV in the previous year in the Health Survey 2017, by age group, gender and sexual preference



Source: Health Survey/Lifestyle Monitor, CBS in collaboration with RIVM, Rutgers, and Soa Aids Nederland, 2017.

* The questionnaire scored respondents' sexual attraction as own sex, opposite sex or both; we included men attracted to men or men attracted to both sexes in the category 'Men attracted to men'. Larger subcategories are shown for 'Men attracted to men' due to low numbers (n≤100). 16-44 years: n=98, STI test: 22.4% (95% confidence interval (CI) 15.1-31.4%), HIV test: 23.5% (95%CI 15.9-32.5%), 45 year and older N=85, STI test: 18.6% (95%CI 11.5-27.8), HIV test: 19.8% (95%CI 12.6-29.4%).

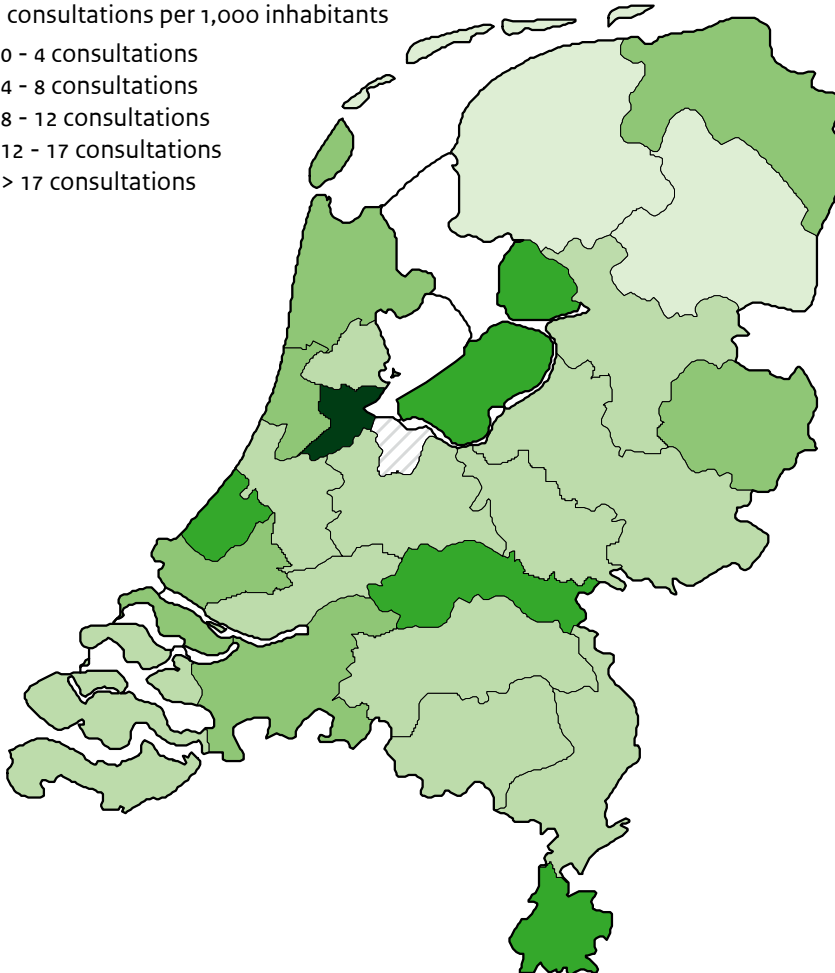
Footnote: Respondents were weighted for demographic characteristics to correct for differences between the sample and the total Dutch population.

2.8 Consultations and characteristics of Sexual Health Centre attendees by region

Figure 2.17 Number of persons with at least one SHC consultation per 1,000 inhabitants of 15-65 years of age by region, 2018

STI consultations per 1,000 inhabitants

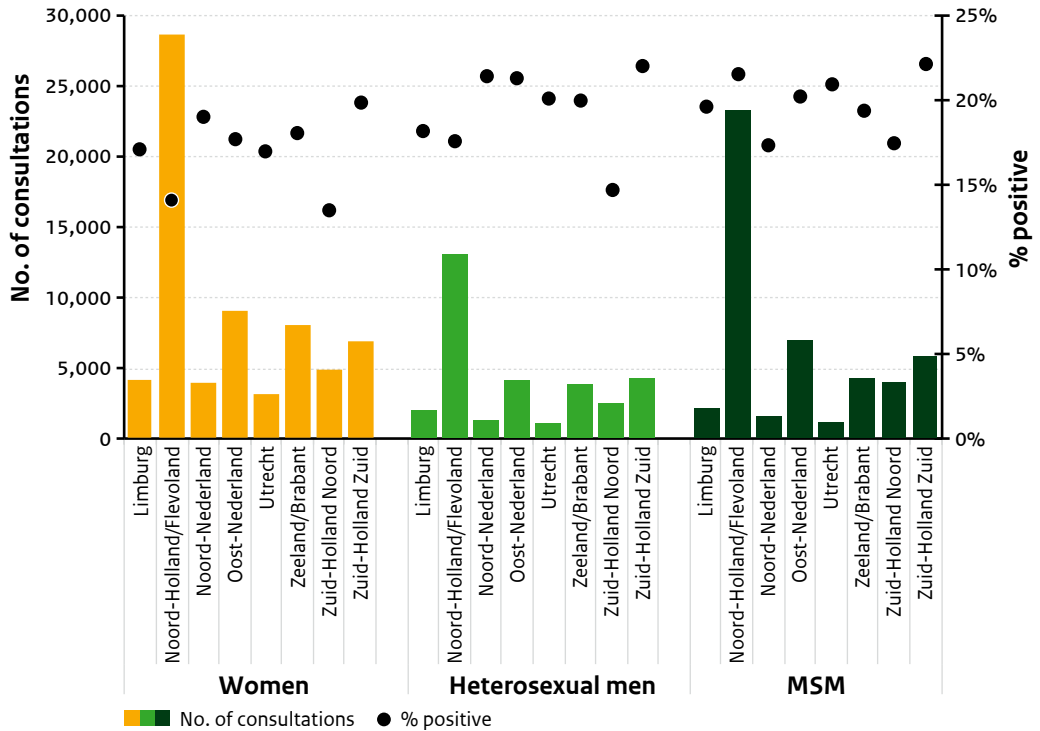
- 0 - 4 consultations
- 4 - 8 consultations
- 8 - 12 consultations
- 12 - 17 consultations
- > 17 consultations



Footnote 1: GGD Amsterdam = 57 per 1,000 inhabitants

Footnote 2: Aggregated data of non-registered consultations included.

Figure 2.18 Number of consultations and percentage of positive STI tests by region, gender and type of sexual contact, 2018



Footnote 1: STI include: chlamydia, gonorrhoea, infectious syphilis, HIV and infectious hepatitis B.
 Footnote 2: Aggregated data of non-registered consultations included.

Figure 2.19 Distribution of age and type of sexual contact of all SHC consultations by region, 2018

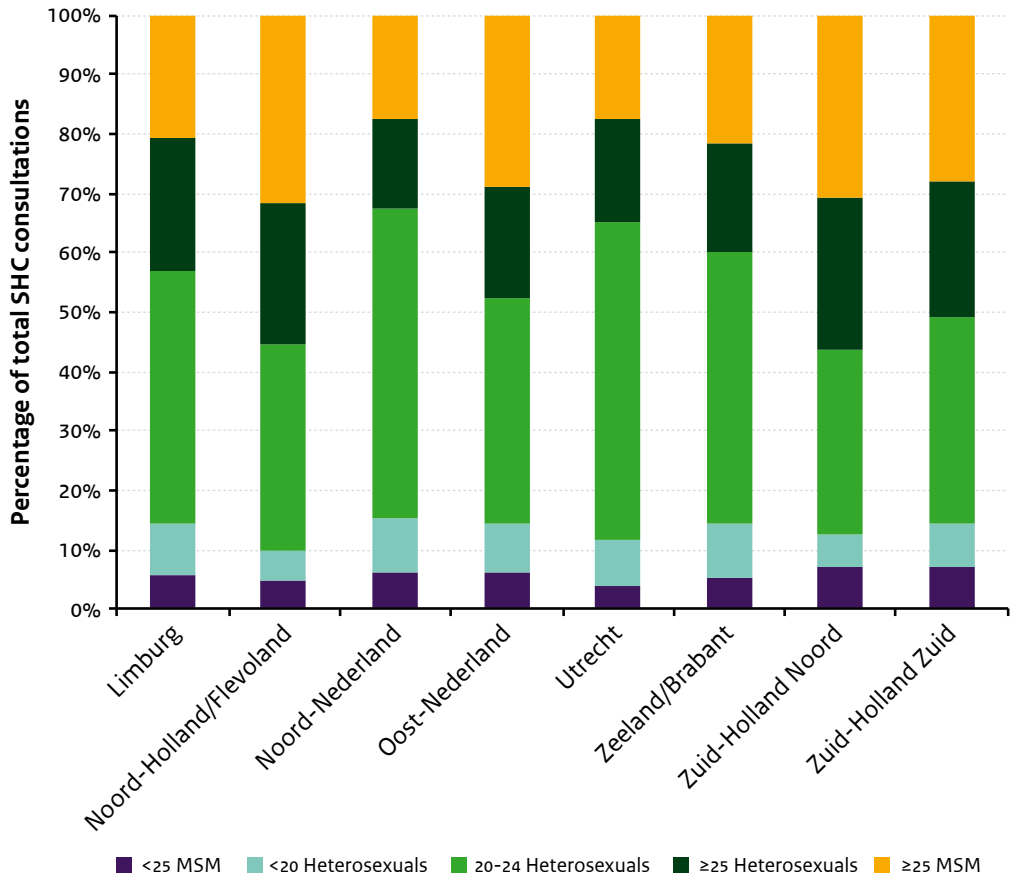


Figure 2.20 Distribution of notified consultations and/or consultations with symptoms of all SHC consultations among heterosexuals ≥ 25 years by region, 2018

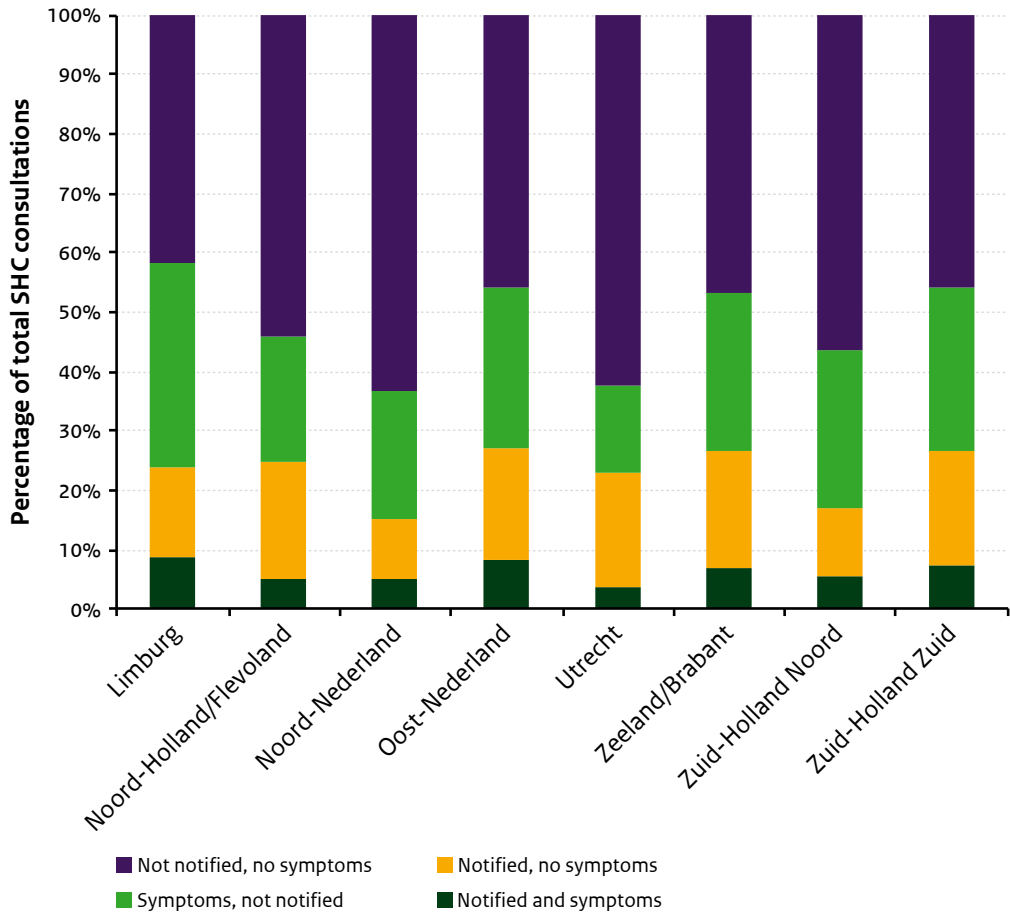
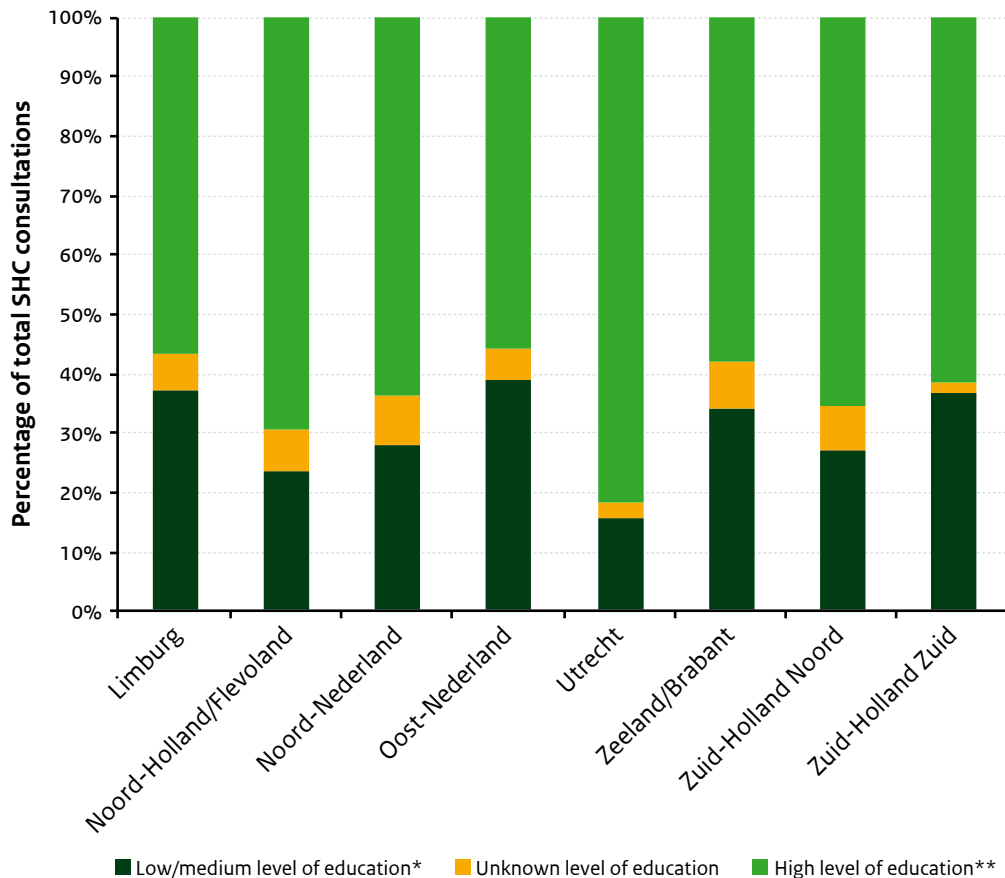


Figure 2.21 Distribution of level of education of all SHC consultations by region, 2018



* No education, elementary school, lbo, mavo, vmbo, mbo.

** Havo, VWO, university of applied sciences, university.

BACTERIAL STI

3 Chlamydia, including lymphogranuloma venereum

3.1 Key points

3.1.1 Sexual Health Centres

- In total, 21,021 chlamydia infections were diagnosed at SHC in 2018, 1.8% less than in 2017.
- Among women and heterosexual men, the chlamydia positivity rate increased from 2009 to 2016, but has remained stable in the past two years; 15.0% in 2018 and 15.4% in 2017 among women, and 17.7% in 2018 and 18.3% in 2017 among heterosexual men. Among MSM, the chlamydia positivity rate has been stable at around 10% for years (9.8% in 2018).
- Of all diagnoses, 2,194 (10.4%) were not registered in the national database. The following key points are based on registered consultations only.
- The highest positivity rates were found in people notified for chlamydia (35.2% in women, 32.8% in heterosexual men and 22.5% in MSM).
- High positivity rates were also seen among heterosexual adolescents aged 15-19 (24.0% among girls and 22.8% among boys), women and heterosexual men from Antillean/Aruban origin (18.2% among women, 21.6% among heterosexual men), heterosexual men with symptoms (26.1%) or a positive STI history in the past year (23.1%), and lower-educated women and heterosexual men (19.2% and 20.7%, respectively).
- Almost 23% of MSM with chlamydia were co-infected with gonorrhoea, 4.7% with syphilis and 1.2% were newly diagnosed with HIV.

3.1.2 General practitioner

- An estimated 39,800 chlamydia infections were diagnosed in general practice in 2017.
- At GPs, the estimated number of chlamydia episodes increased by 8% both in men (to around 17,000 episodes in 2017) and women (to around 22,800 episodes in 2017) compared to 2016.
- The annual reporting rate in women was higher in women under 25 (4.5 per 1,000) than in women aged 25 and older (2.0 per 1,000), while in men, rates were similar in the two groups (2.2 and 1.9 per 1,000 respectively).

3.1.3 Lymphogranuloma venereum at Sexual Health Centres

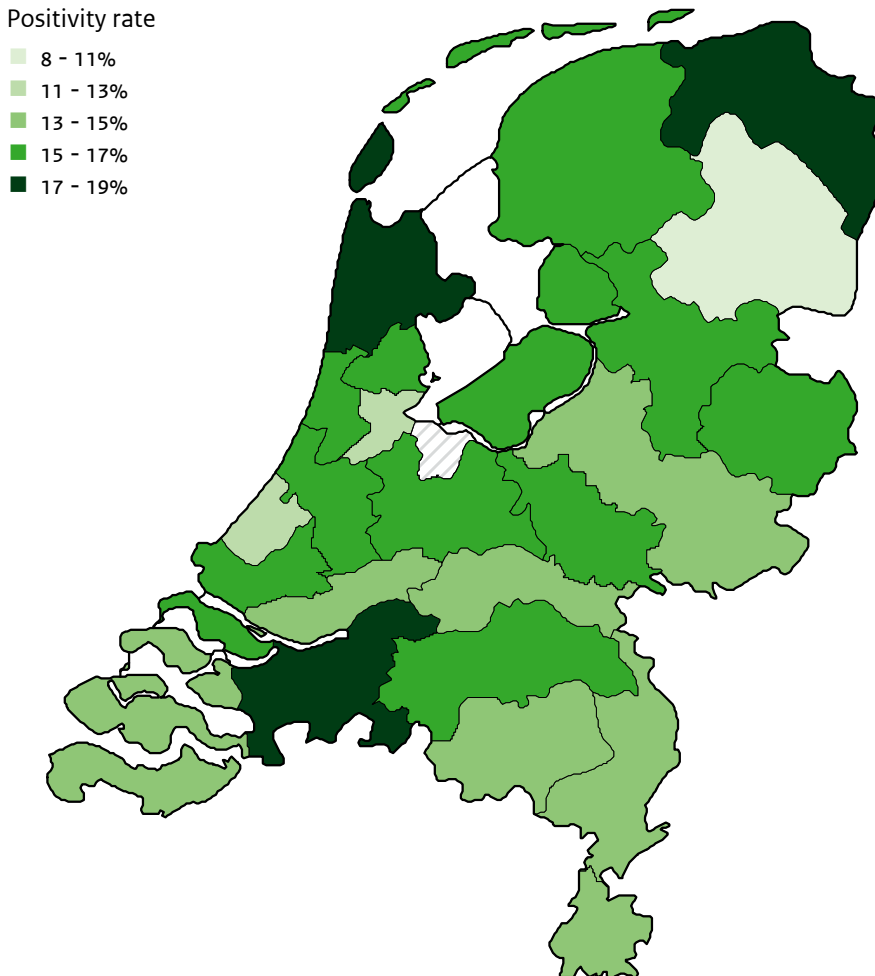
- The number of LGV cases further increased by 3% to 278 in 2018 (non-registered consultations included). The percentage HIV-negative among LGV positives (50% in 2018) has continued to increase from 2014 (21%). The rectal LGV positivity rate among HIV-positive MSM tested

for chlamydia infection has fluctuated over time at around 2% (2.3% in 2018). Among HIV-negative MSM, the LGV trend was stable and low (0.3% in 2018).

- The percentage of asymptomatic rectal LGV cases increased from 32% in 2013 to 53% in 2018 (registered consultations only).

3.2 Sexual Health Centres: characteristics, risk groups and trends

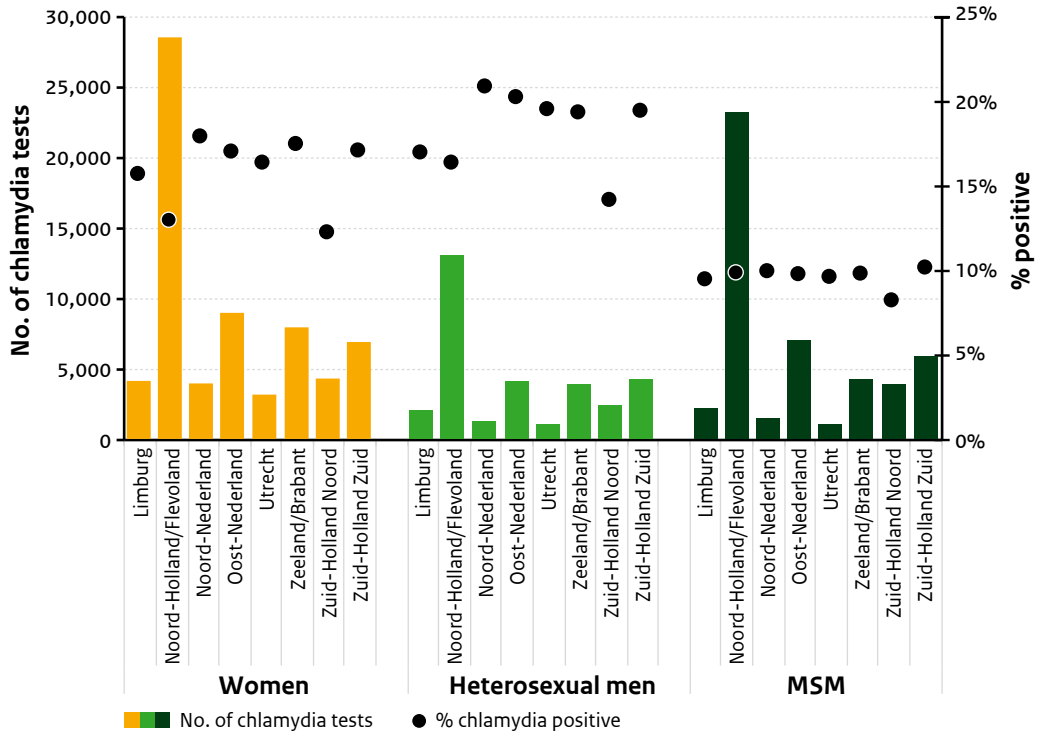
Figure 3.1 Positivity rates of chlamydia by region, the Netherlands, 2018



Footnote 1: GGD Gooi en Vechtstreek (grey striped region) does not have an SHC. Hence, no STI data were available for this region.

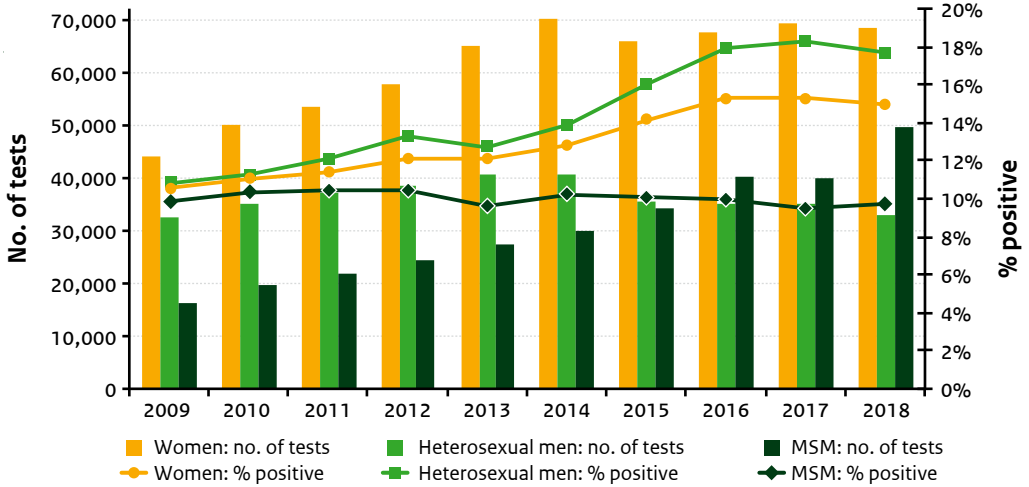
Footnote 2: Aggregated data of non-registered consultations included.

Figure 3.2 Number of chlamydia tests and percentage of chlamydia positives by region, gender and type of sexual contact, 2018



Footnote: Aggregated data of non-registered consultations included.

Figure 3.3 Total number of tests and positivity rate of chlamydia by gender and type of sexual contact, 2009-2018



Footnote: Aggregated data of non-registered consultations included.

Figure 3.4 Trends in positivity rate for chlamydia in MSM by HIV status, 2009-2018

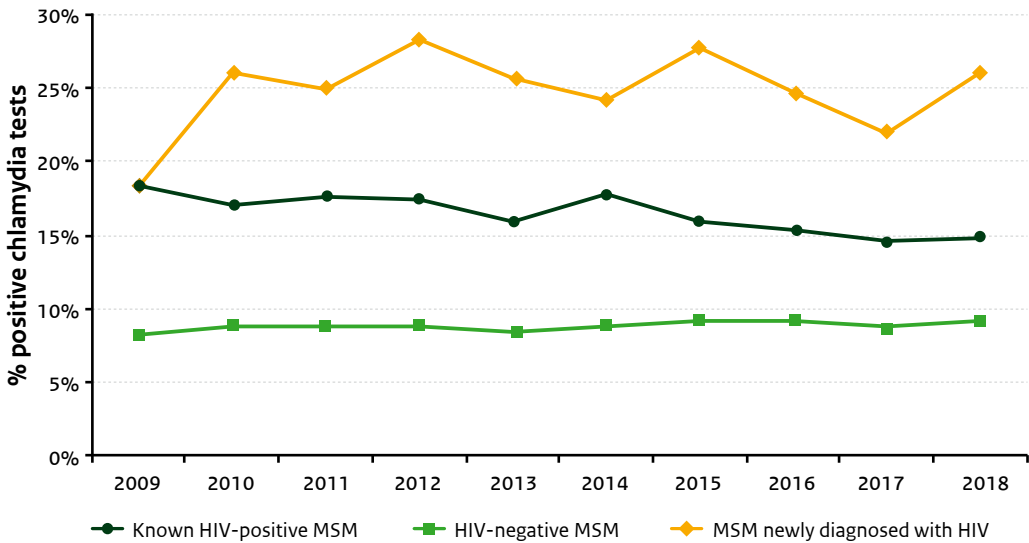


Table 3.1 Number of positive tests and persons tested for chlamydia by age, gender and type of sexual contact, 2018

Age (years)	Women		Heterosexual men		MSM	
	n positive/N	%	n positive/N	%	n positive/N	%
≤19	1,751/7,306	24.0	482/2,118	22.8	99/930	10.6
20-24	5,836/35,887	16.3	3,122/16,070	19.4	608/6,123	9.9
25-29	1,163/10,209	11.4	1,106/6,628	16.7	805/8,202	9.8
30-34	245/2,884	8.5	315/2,226	14.2	610/6,410	9.5
35-39	103/1,530	6.7	104/982	10.6	510/4,817	10.6
40-44	61/954	6.4	23/470	4.9	402/4,170	9.6
45-49	62/945	6.6	31/374	8.3	360/4,012	9.0
50-54	52/765	6.8	18/246	7.3	374/3,775	9.9
≥ 55	53/562	9.4	25/305	8.2	507/5,413	9.4
Total	9,326/61,042	15.3	5,226/29,419	17.8	4,275/43,854	9.7

Figure 3.5 Trends in positivity rate for chlamydia in women and heterosexual men by age group, 2009-2018

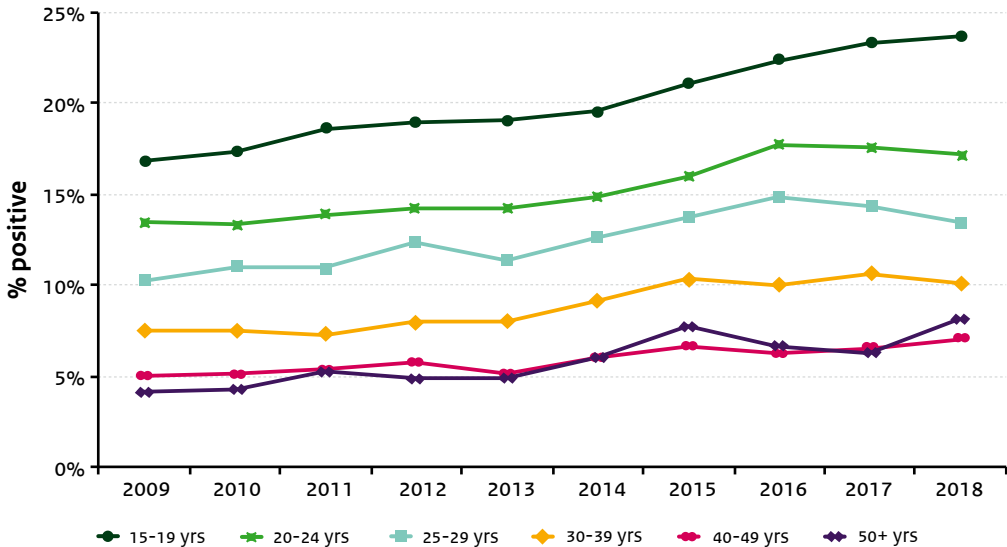


Table 3.2a Number of positive tests and persons tested for chlamydia by migration background, gender and type of sexual contact, 2018

Migration background	Women		Heterosexual men		MSM	
	n positive/N	%	n positive/N	%	n positive/N	%
Ethnic Dutch	6,994/44,067	15.9	3,384/18,395	18.4	2,794/29,544	9.5
Western migrants	830/6,858	12.1	401/2,715	14.8	644/6,639	9.7
First generation non-Western migrants	423/3,663	11.5	490/3,070	16.0	565/5,098	11.1
Second generation non-Western migrants	1,073/6,417	16.7	949/5,214	18.2	269/2,542	10.6
Non-Western, generation unknown	1/6	16.7	1/3	33.3	1/3	33.3
Unknown	5/31	16.1	1/22	4.5	2/28	7.1
Total	9,326/61,042	15.3	5,226/29,419	17.8	4,275/43,854	9.7

Table 3.2b Number of positive tests and persons tested for chlamydia among first and second generation migrants from an STI/HIV endemic area by region of origin, gender and type of sexual contact, 2018

Region of origin	Women		Heterosexual men		MSM	
	n positive/N	%	n positive/N	%	n positive/N	%
Turkey	106/633	16.7	125/832	15.0	71/735	9.7
North Africa/Morocco	150/977	15.4	195/1,286	15.2	69/641	10.8
Suriname	423/2,615	16.2	412/2,131	19.3	133/1,261	10.5
Netherlands Antilles/Aruba	266/1,465	18.2	244/1,130	21.6	112/982	11.4
Sub-Saharan Africa	181/1,283	14.1	232/1,211	19.2	63/552	11.4
Eastern Europe	179/2,266	7.9	66/479	13.8	139/1,203	11.6
Latin America	139/1,424	9.8	90/547	16.5	180/1,483	12.1
Asia	364/2,445	14.9	203/1,488	13.6	313/3,020	10.4
Total	1,808/13,108	13.8	1,567/9,104	17.2	1,080/9,877	10.9

Table 3.3a Number of positive tests and persons tested for chlamydia by triage indication, gender and type of sexual contact, 2018

	Women		Heterosexual men		MSM	
	n positive/N	%	n positive/N	%	n positive/N	%
Notified						
Not notified	6,117/50,743	12.1	2,810/21,351	13.2	2,976/35,729	8.3
Notified for chlamydia	2,861/8,118	35.2	2,241/6,838	32.8	714/3,174	22.5
Notified for other STI/HIV	74/610	12.1	39/452	8.6	517/4,469	11.6
Unknown	274/1,571	17.4	136/778	17.5	68/482	14.1
Symptoms						
No	5,895/42,523	13.9	2,799/20,110	13.9	3,061/35,914	8.5
Yes	3,402/18,275	18.6	2,413/9,231	26.1	1,206/7,895	15.3
Unknown	29/244	11.9	14/78	17.9	8/45	17.8
STI/HIV endemic area						
No	7,518/47,934	15.7	3,659/20,315	18.0	3,195/33,977	9.4
Yes	1,808/13,108	13.8	1,567/9,104	17.2	1,080/9,877	10.9
Age <25 years						
No	1,739/17,880	9.7	1,622/11,254	14.4	3,568/36,931	9.7
Yes	7,587/43,240	17.5	3,604/18,200	19.8	707/7,081	10.0
Partner in risk group*						
No	6,958/43,006	16.2	4,007/20,352	19.7	2,652/27,746	9.6
Yes	2,262/16,947	13.3	1,189/8,818	13.5	1,560/15,374	10.1
Unknown	106/1,089	9.7	30/249	12.0	63/734	8.6
Sex worker						
No	8,893/54,873	16.2	5,165/28,738	18.0	4,154/42,774	9.7
Yes, in past 6 months	322/5,225	6.2	15/161	9.3	92/777	11.8
Unknown	111/944	11.8	46/520	8.8	29/303	9.6
Gonorrhoea/chlamydia/syphilis in past year						
Not tested	5,928/37,076	16.0	3,830/21,677	17.7	1,186/13,337	8.9
Tested, negative	2,007/16,154	12.4	764/4,904	15.6	1,426/17,472	8.2
Tested, positive	1,329/7,217	18.4	603/2,609	23.1	1,513/11,262	13.4
Tested, unknown	14/117	12.0	7/43	16.3	38/274	13.9
Unknown	48/478	10.0	22/186	11.8	112/1,509	7.4

* For heterosexual men and MSM: partner originating from a high STI/HIV endemic country.
For women: partner originating from a high STI/HIV endemic country or a male partner who had sex with men.

Table 3.3b Number of positive tests and persons tested for chlamydia by demographics, (sexual) behavioural characteristics, gender and type of sexual contact, 2018

	Women		Heterosexual men		MSM	
	n positive/N	%	n positive/N	%	n positive/N	%
Socioeconomic status						
High	2,670/17,838	15.0	1,435/8,191	17.5	1,212/13,467	9.0
Medium	2,424/15,498	15.6	1,273/7,133	17.8	1,018/10,615	9.6
Low	3,957/24,537	16.1	2,406/13,345	18.0	1,889/18,252	10.3
Unknown	275/3,169	8.7	112/750	14.9	156/1,520	10.3
Educational level*						
High	5,530/39,227	14.1	2,966/18,041	16.4	2,649/28,765	9.2
Low/medium	3,479/18,143	19.2	2,105/10,146	20.7	1,334/11,919	11.2
Unknown	317/3,672	8.6	155/1,232	12.6	292/3,170	9.2
Number of partners in past 6 months						
0 partners	39/489	8.0	17/222	7.7	29/386	7.5
1 partner	2,309/16,080	14.4	858/5,369	16.0	230/3,360	6.8
2 partners	2,500/15,670	16.0	1,020/6,057	16.8	316/4,386	7.2
3 or more partners	4,328/26,584	16.3	3,303/17,580	18.8	3,614/34,997	10.3
Unknown	150/2,219	6.8	28/191	14.7	86/725	11.9
Receptive anal sex, in past 6 months						
No receptive anal sex	7,196/46,531	15.5			687/11,238	6.1
Yes, consistently with a condom	153/1,546	9.9			547/7,675	7.1
Yes, not consistently with a condom	1,707/10,547	16.2			2,891/23,080	12.5
Unknown	270/2,418	11.2			150/1,861	8.1
Insertive anal sex, in past 6 months						
No insertive anal sex			3,998/21,942	18.2	545/8,042	6.8
Yes, consistently with a condom			61/601	10.1	573/8,556	6.7
Yes, not consistently with a condom			534/3,120	17.1	3,013/25,461	11.8
Unknown			630/3,724	16.9	144/1,795	8.0

Table 3.3b (continued) Number of positive tests and persons tested for chlamydia by demographics, (sexual) behavioural characteristics, gender and type of sexual contact, 2018

	Women		Heterosexual men		MSM	
	n positive/N	%	n positive/N	%	n positive/N	%
Vaginal sex, in past 6 months**						
No vaginal sex	53/568	9.3	28/295	9.5	65/745	8.7
Yes, consistently with a condom	380/4,542	8.4	170/2,008	8.5	62/943	6.6
Yes, not consistently with a condom	8,718/54,248	16.1	4,945/26,393	18.7	359/4,179	8.6
Unknown	175/1,684	10.4	83/723	11.5	60/865	6.9
Receptive oral sex, in past 6 months						
No receptive oral sex	1,136/7,000	16.2			148/2,084	7.1
Yes, consistently with a condom	93/1,332	7.0			31/446	7.0
Yes, not consistently with a condom	7,608/48,959	15.5			3,899/38,831	10.0
Unknown	486/3,747	13.0			196/2,481	7.9
Client of sex worker						
No	8,065/49,788	16.2	5,003/26,775	18.7	4,145/42,153	9.8
Yes, in past 6 months	9/143	6.3	179/2,083	8.6	100/1,365	7.3
Unknown	1,252/11,111	11.3	44/561	7.8	30/336	8.9
Previous HIV test						
No	7,091/41,526	17.1	3,833/20,167	19.0	426/4,903	8.7
Yes, positive	5/36	13.9	3/15	20.0	706/4,772	14.8
Yes, negative	1,987/17,785	11.2	1,256/8,367	15.0	3,115/33,954	9.2
Yes, result unknown	16/104	15.4	5/24	20.8	9/54	16.7
Unknown	227/1,591	14.3	129/846	15.2	19/171	11.1

* Low/medium level of education: no education, elementary school, lbo, mavo, vmbo, mbo; high level of education: havo, vwo, university of applied sciences, university.

** For MSM: numbers are reported for men who had sex with both men and women (N=6,732). Men who had sex with men only are excluded.

Table 3.4 Concurrent STI by gender and type of sexual contact among persons diagnosed with chlamydia, 2018

Concurrent infection	Women (N=9,326) n (%)	Heterosexual men (N=5,226) n (%)	MSM (N=4,275) n (%)
Gonorrhoea	395 (4.2)	252 (4.8)	969 (22.7)
Syphilis, infectious	2 (0.0)	4 (0.1)	199 (4.7)
HIV newly diagnosed	2 (0.0)	1 (0.0)	52 (1.2)
Genital herpes	21 (0.2)	4 (0.1)	21 (0.5)
Genital warts	56 (0.6)	79 (1.5)	26 (0.6)
Hepatitis B, infectious	0 (0.0)	7 (0.1)	3 (0.1)
Hepatitis C	0 (0.0)	0 (0.0)	7 (0.2)

Footnote: SHC check for genital herpes and genital warts on indication only. In addition, clients are not routinely tested on hepatitis C.

Table 3.5 Number and percentage of positive tests for chlamydia by anatomic location, gender and type of sexual contact, 2018

Location	Women n positive (%)	Heterosexual men n positive (%)	MSM n positive (%)
Urogenital	8,763 (14.4)	5,218 (17.7)	1,345 (3.1)
Anorectal	2,702 (12.3)	13 (5.7)	3,168 (7.5)
Oral	505 (2.4)	3 (1.1)	453 (1.1)

Footnote 1: Heterosexual men are usually only tested urogenital, while women are tested on indication for anorectal or oral chlamydia; indications vary by region. MSM are usually tested in all three locations.

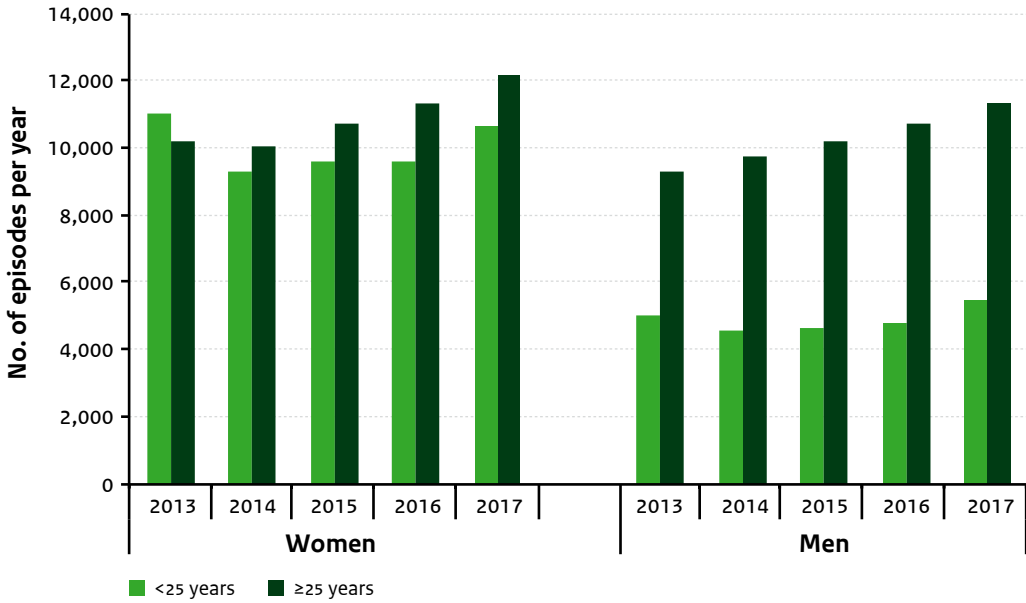
Footnote 2: Please note that people can have positive tests at multiple locations.

Table 3.6 Anatomic location of chlamydia infection by gender and type of sexual contact, 2018

Location	Women (N=9,326) n (%)	Heterosexual men (N=5,226) n (%)	MSM (N=4,274) n (%)
Urogenital only	6,344 (68.0)	5,210 (99.7)	921 (21.5)
Anorectal only	426 (4.6)	6 (0.1)	2,531 (59.2)
Oral only	104 (1.1)	2 (0.0)	169 (4.0)
Urogenital and anorectal	2,051 (22.0)	7 (0.0)	369 (8.6)
Urogenital and oral	176 (1.9)	1 (0.0)	16 (0.4)
Anorectal and oral	34 (0.4)	0 (0.0)	229 (5.4)
Urogenital and anorectal and oral	191 (2.0)	0 (0.0)	39 (0.9)

3.3 General practitioner

Figure 3.6 Estimated annual number of reported episodes of chlamydia at GPs by gender and age group, based on extrapolation from GP practices in Nivel-PCD, 2013-2017



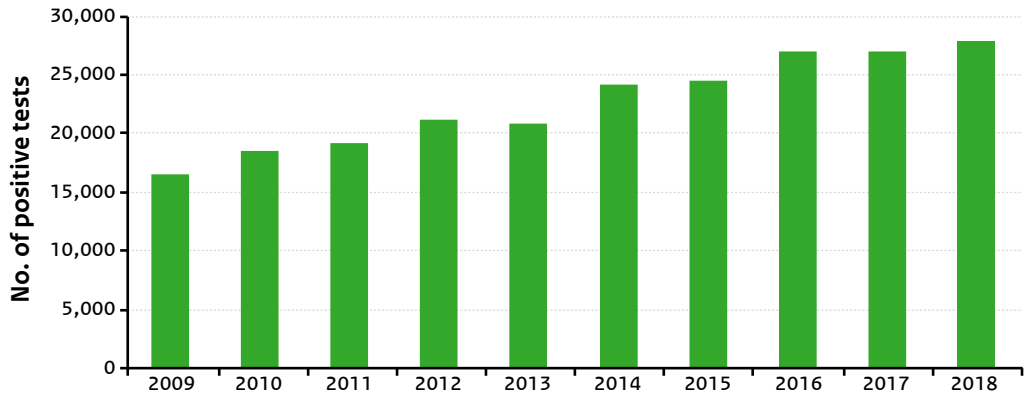
Footnote: About 70% of the total Dutch population consists of persons aged ≥ 25 years and about 30% consists of persons aged < 25 years.

Table 3.7 Annual reporting rate (number of episodes per 1,000 persons) of chlamydia at GPs in the Netherlands by gender and age group, based on GP practices in Nivel-PCD, 2013-2017

	Women n/1,000			Men n/1,000			Total n/1,000		
	All	<25	≥ 25	All	<25	≥ 25	All	<25	≥ 25
2013	2.6	4.6	1.7	1.7	2.0	1.6	2.1	3.3	1.7
2014	2.3	3.9	1.7	1.7	1.8	1.7	2.0	2.9	1.7
2015	2.3	4.0	1.8	1.8	1.9	1.8	2.1	3.0	1.8
2016	2.4	4.0	1.8	1.9	1.9	1.8	2.1	3.0	1.8
2017	2.6	4.5	2.0	2.0	2.2	1.9	2.3	3.3	1.9

3.4 Laboratory surveillance

Figure 3.7 Number of positive tests for *Chlamydia trachomatis* from up to 21 medical microbiology laboratories, 2009-2018

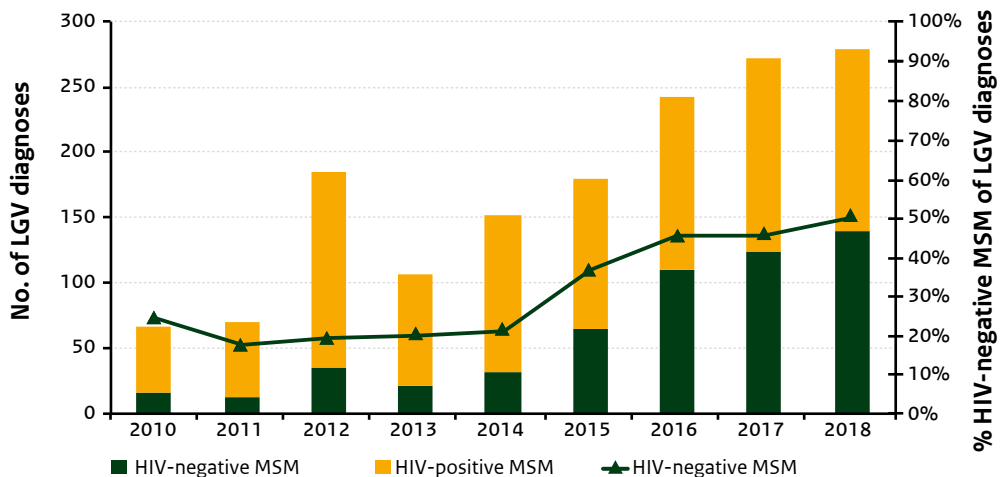


Source: 'Virologische weekstaten'

Footnote: 20 medical microbiology laboratories in 2018

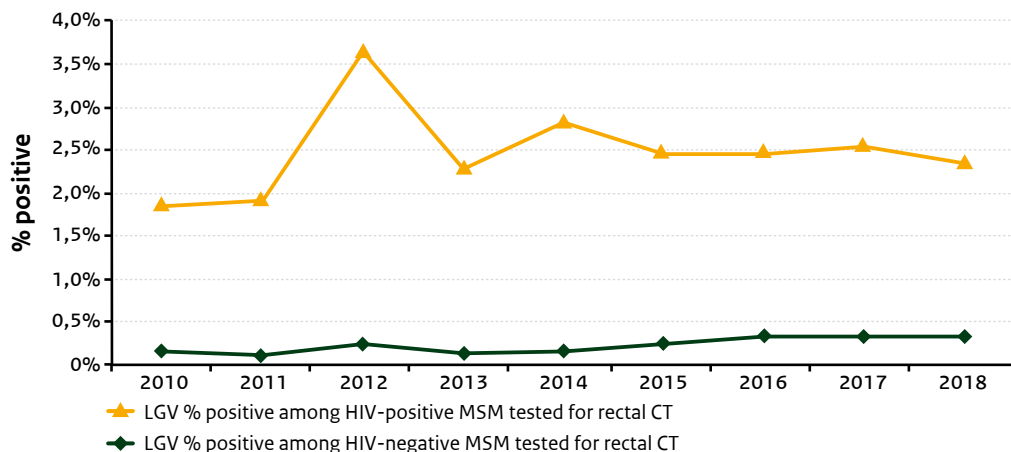
3.5 Lymphogranuloma venereum at Sexual Health Centres

Figure 3.8 Number of LGV diagnoses among MSM by HIV status, 2010-2018



Footnote: Aggregated data of non-registered consultations included.

Figure 3.9 Rectal LGV positivity rate by HIV status among MSM tested for rectal chlamydia infection, 2010-2018



Footnote: Aggregated data of non-registered consultations included.

Table 3.8 Characteristics of MSM diagnosed with LGV, 2013-2018

	2013 (N=106) n (%)	2014 (N=152) n (%)	2015 (N=179) n (%)	2016 (N=242) n (%)	2017 (N=271) n (%)	2018 (N=231) n (%)
Median age (range)	43 (19-69)	42 (21-63)	41 (18-66)	39 (16-75)	40 (19-73)	43 (20-74)
Dutch ethnicity	117 (63.6)	71 (67.0)	101 (66.4)	118 (65.9)	158 (65.3)	134 (58.0)
Known HIV-positive	140 (76.1)	83 (78.3)	116 (76.3)	113 (63.1)	131 (54.1)	107 (46.3)
Notified for LGV	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	12 (0.0)	15 (6.5)
Concurrent gonorrhoea	47 (25.5)	30 (28.3)	40 (26.3)	48 (26.8)	91 (37.6)	73 (31.6)
Concurrent syphilis	17 (9.2)	9 (8.5)	11 (7.2)	18 (10.1)	31 (12.8)	24 (10.4)
Concurrent new HIV diagnosis	9 (4.9)	2 (1.9)	4 (2.6)	1 (0.6)	2 (0.8)	4 (1.7)
Symptoms recorded	126 (68.5)	79 (74.5)	95 (62.5)	96 (53.6)	142 (58.7)	108 (46.8)

Footnote: In addition, two heterosexual men and one women were diagnosed with LGV in 2018. Of 231 LGV infections among MSM, 229 infections were anal and two infections were urethral. Before 2018, anatomic location of LGV infection was not registered.

4 Gonorrhoea

4.1 Key points

4.1.1 Sexual Health Centres

- In 2018, 7,362 clients (75.5% MSM, 15.7% women, and 8.8% heterosexual men) were diagnosed with gonorrhoea at the SHC in the Netherlands, an increase of 8.8% compared to 2017, mainly due to an increased number of diagnoses among MSM.
- Positivity rates for gonorrhoea were comparable to the previous two years. Among MSM, 11.2% tested positive (11.0% in 2017), among heterosexual men 2.0% (1.9% in 2017), and among women 1.7% (1.6% in 2017).
- Of all diagnoses, 984 (13.4%) were not registered in the national database. The following key points are based on registered consultations only.
- High positivity rates were seen among people notified for gonorrhoea (MSM 30.9%, heterosexual men 19.0%, women 29.8%). Other groups with higher positivity rates were men who report symptoms, (newly) HIV-positive MSM, heterosexual men and women from an STI/HIV endemic area, men who previously had an STI and women and heterosexual men with a low/medium educational level.
- Of women and heterosexual men diagnosed with gonorrhoea, 41.8% had a chlamydia co-infection. Of MSM diagnosed with gonorrhoea, 3.5% were also diagnosed with syphilis and 1.0% were newly diagnosed with HIV.

4.1.2 General practitioner

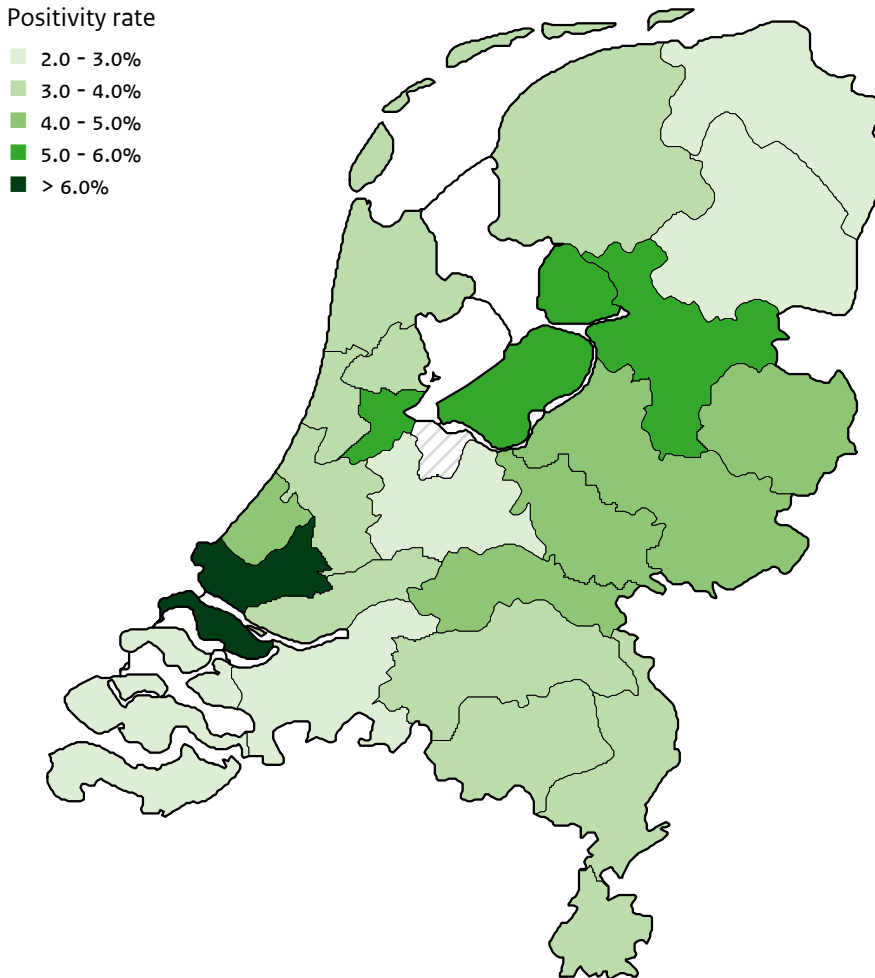
- An estimated 9,550 patients were diagnosed with gonorrhoea in general practice in 2017; an increase of 6.5% compared to 2016. This increase was mainly due to an increase of episodes among women aged over 25. The reporting rate for gonorrhoea was 0.6 per 1,000 population, and is higher among men than among women (0.7 versus 0.4 per 1,000).

4.1.3 Antimicrobial resistance of gonococci in the Netherlands

- Within the SHC participating in the Gonococcal Resistance to Antimicrobials Surveillance (GRAS) programme, culture was performed for 73.5% of gonorrhoea patients. Due to negative or failed cultures, susceptibility test results were available for 39.2% of patients.
- Antimicrobial resistance to ceftriaxone (first-choice treatment in the Netherlands) was not found. Resistance to ciprofloxacin was 33.7% and resistance to cefotaxime was 1.9%.
- Resistance to azithromycin greatly increased over the past years, from 2.1% in 2012 to 10.8% in 2018. The increasing trend is visible nationwide. However, the strength of this increase is strongly influenced by regional data. An explanation for these regional differences has not yet been found.

4.2 Sexual Health Centres: characteristics, risk groups and trends

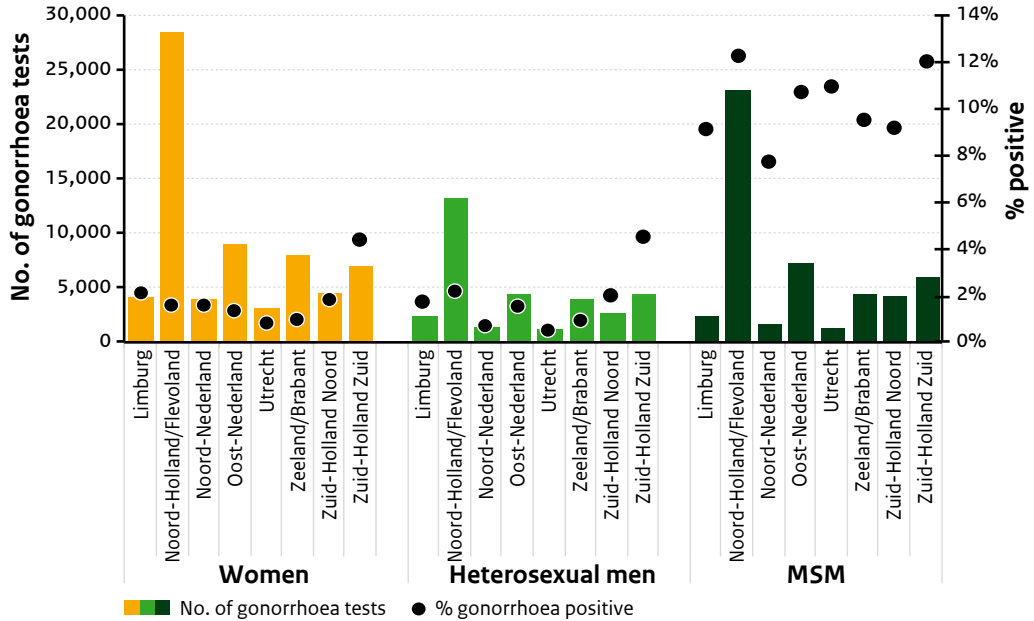
Figure 4.1 Positivity rates of gonorrhoea by region, the Netherlands, 2018



Footnote 1: GGD Gooi en Vechtstreek (grey striped region) does not have an SHC. Hence, no STI data were available for this region.

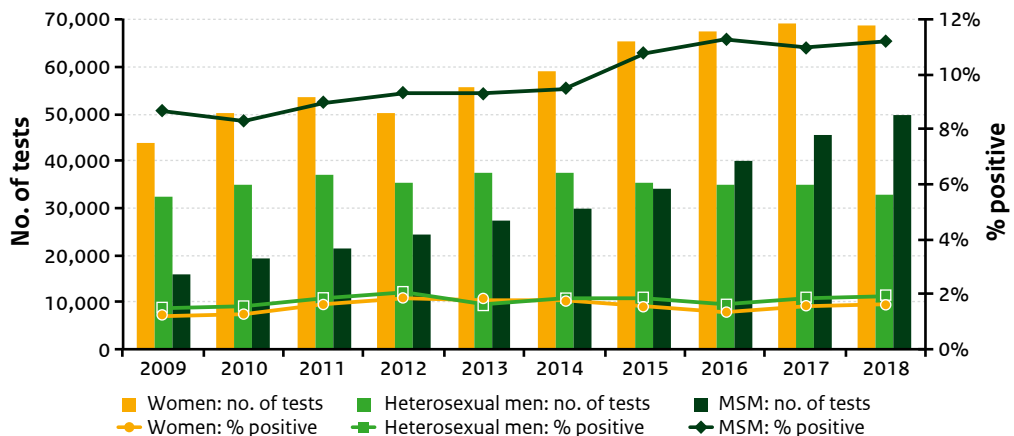
Footnote 2: Aggregated data of non-registered consultations included.

Figure 4.2 Number of gonorrhoea tests and percentage of gonorrhoea positives by region, gender and type of sexual contact, 2018



Footnote: Aggregated data of non-registered consultations included.

Figure 4.3 Total number of tests and positivity rate of gonorrhoea by gender and type of sexual contact, 2009-2018



Footnote 1: Between 2012 and 2015, attendees below the age of 25 years with no further risk factors were only tested for chlamydia. Since 2015, attendees below the age of 25 years with no further risk factors were tested for chlamydia and gonorrhoea.

Footnote 2: Aggregated data of non-registered consultations included.

Table 4.1 Number of positive tests and persons tested for gonorrhoea by age, gender and type of sexual contact, 2018

Age (years)	Women		Heterosexual men		MSM	
	n positive/N	%	n positive/N	%	n positive/N	%
≤19	228/7,301	3.1	77/2,118	3.6	119/931	12.8
20-24	456/35,879	1.3	237/16,064	1.5	797/6,124	13.0
25-29	164/10,209	1.6	122/6,628	1.8	1,011/8,201	12.3
30-34	42/2,885	1.5	55/2,226	2.5	794/6,410	12.4
35-39	28/1,530	1.8	16/983	1.6	547/4,819	11.4
40-44	23/954	2.4	9/470	1.9	468/4,175	11.2
45-49	29/945	3.1	8/374	2.1	384/4,014	9.6
50-54	21/765	2.7	4/246	1.6	329/3,776	8.7
≥ 55	15/562	2.7	11/305	3.6	384/5,414	7.1
Total	1,006/61,030	1.6	539/29,414	1.8	4,833/43,866	11.0

Figure 4.4 Trends in positivity rate for gonorrhoea in MSM by HIV-status, 2009-2018

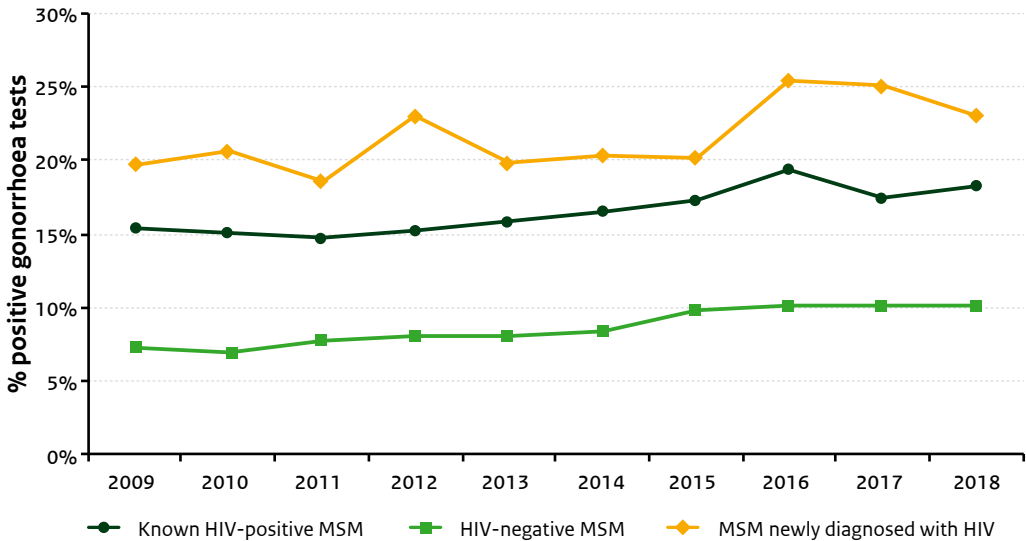
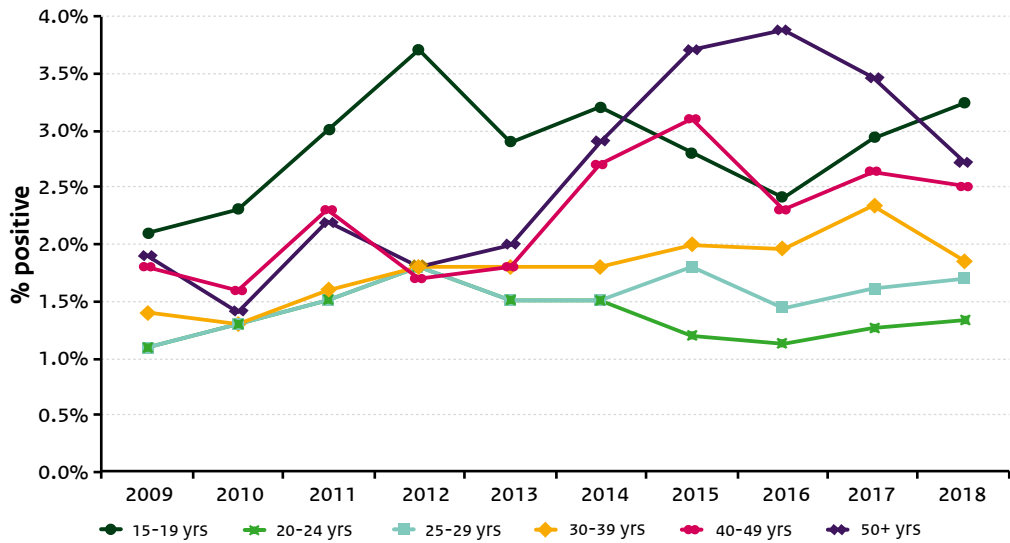


Figure 4.5a Trends in positivity rate for gonorrhoea in women and heterosexual men by age group, 2009-2018



Footnote: Between 2012 and 2015, attendees below the age of 25 years with no further risk factors were only tested for chlamydia. Since 2015, attendees below the age of 25 years with no further risk factors were tested for chlamydia and gonorrhoea.

Figure 4.5b Trends in positivity rate for gonorrhoea in MSM by age group, 2009-2018

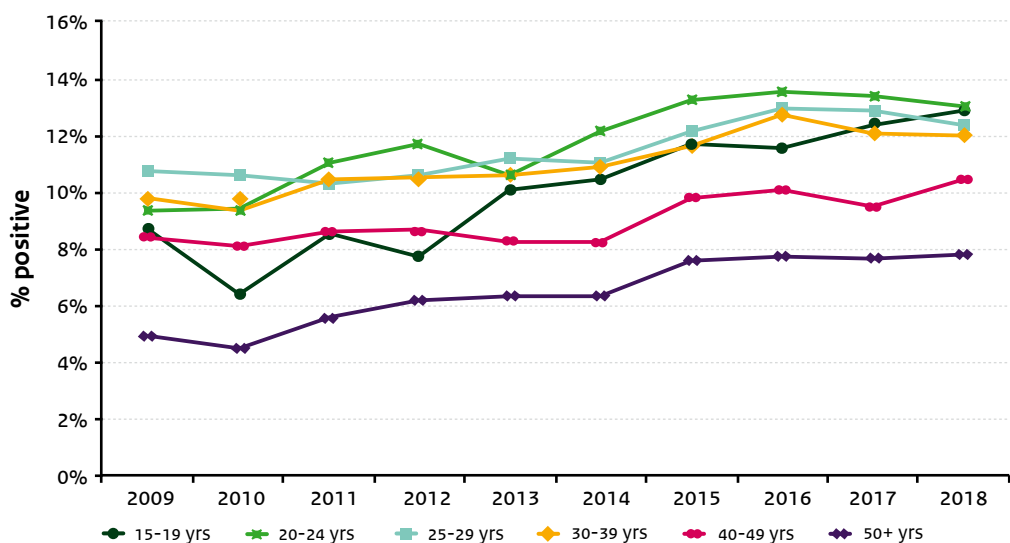


Table 4.2a Number of positive tests and persons tested for gonorrhoea by migration background, gender and type of sexual contact, 2018

Migration background	Women		Heterosexual men		MSM	
	n positive/N	%	n positive/N	%	n positive/N	%
Ethnic Dutch	518/44,055	1.2	144/18,389	0.8	3,104/29,554	10.5
Western migrants	131/6,857	1.9	33/2,715	1.2	754/6,638	11.4
First generation non-Western migrants	100/3,664	2.7	141/3,070	4.6	649/5,098	12.7
Second generation non-Western migrants	257/6,417	4.0	221/5,215	4.0	322/2,545	12.7
Non-Western, generation unknown	0/6	0.0	0/3	0.0	1/3	33.3
Unknown	0/31	0.0	0/22	0.0	3/28	10.7
Total	1,006/61,030	1.6	539/29,414	1.8	4,833/43,866	11.0

Table 4.2b Number of positive tests and persons tested for gonorrhoea among first and second generation migrants from an STI/HIV endemic area by region of origin, gender and type of sexual contact, 2018

Region of origin	Women		Heterosexual men		MSM	
	n positive/N	%	n positive/N	%	n positive/N	%
Turkey	24/633	3.8	22/832	2.6	87/737	11.8
North Africa/Morocco	25/977	2.6	37/1,286	2.9	76/641	11.9
Suriname	119/2,615	4.6	102/2,132	4.8	159/1,262	12.6
Netherlands Antilles/Aruba	81/1,465	5.5	100/1,130	8.8	140/981	14.3
Sub-Saharan Africa	39/1,283	3.0	63/1,211	5.2	69/552	12.5
Eastern Europe	59/2,267	2.6	4/479	0.8	188/1,203	15.6
Latin America	35/1,424	2.5	17/547	3.1	223/1,483	15.0
Asia	47/2,446	1.9	26/1,488	1.7	309/3,020	10.2
Total	429/13,110	3.3	371/9,105	4.1	1,251/9,879	12.7

Table 4.3a Number of positive tests and persons tested for gonorrhoea by triage indication, gender and type of sexual contact, 2018

	Women		Heterosexual men		MSM	
	n positive/N	%	n positive/N	%	n positive/N	%
Notified						
Not notified	660/50,729	1.3	371/21,347	1.7	3,299/35,738	9.2
Notified for gonorrhoea	197/660	29.8	96/505	19.0	1,084/3,504	30.9
Notified for other STI/HIV	98/8,069	1.2	56/6,784	0.8	391/4,142	9.4
Unknown	51/1,572	3.2	16/778	2.1	59/482	12.2
Symptoms						
No	611/42,508	1.4	140/20,105	0.7	3,087/35,921	8.6
Yes	391/18,277	2.1	398/9,231	4.3	1,741/7,900	22.0
Unknown	4/245	1.6	1/78	1.3	5/45	11.1
STI/HIV endemic area						
No	577/47,920	1.2	168/20,309	0.8	3,582/33,987	10.5
Yes	429/13,110	3.3	371/9,105	4.1	1,251/9,879	12.7
Age <25 years						
No	322/17,850	1.8	225/11,232	2.0	3,917/36,809	10.6
Yes	684/43,180	1.6	314/18,182	1.7	916/7,055	13.0
Partner in risk group*						
No	489/42,990	1.1	329/20,347	1.6	2,911/27,754	10.5
Yes	487/16,949	2.9	205/8,818	2.3	1,858/15,377	12.1
Unknown	30/1,091	2.7	5/249	2.0	64/735	8.7
Sex worker						
No	865/54,859	1.6	532/28,733	1.9	4,698/42,786	11.0
Yes, in past 6 months	139/5,227	2.7	2/161	1.2	109/777	14.0
Unknown	2/944	0.2	5/520	1.0	26/303	8.6
Gonorrhoea/chlamydia/syphilis in past year						
Not tested	529/37,067	1.4	373/21,673	1.7	1,095/13,342	8.2
Tested, negative	266/16,148	1.6	72/4,904	1.5	1,582/17,472	9.1
Tested, positive	196/7,219	2.7	90/2,608	3.5	1,976/11,269	17.5
Tested, unknown	4/117	3.4	2/43	4.7	43/274	15.7
Unknown	11/479	2.3	2/186	1.1	137/1,509	9.1

* For heterosexual men and MSM: partner originating from a high STI/HIV endemic country.
For women: partner originating from a high STI/HIV endemic country or a male partner who had sex with men.

Table 4.3b Number of positive tests and persons tested for gonorrhoea by demographics, (sexual) behavioural characteristics, gender and type of sexual contact, 2018

	Women		Heterosexual men		MSM	
	n positive/N	%	n positive/N	%	n positive/N	%
Socioeconomic status						
High	215/17,837	1.2	86/8,190	1.1	1,410/13,471	10.5
Medium	180/15,497	1.2	75/7,130	1.1	1,143/10,620	10.8
Low	534/24,527	2.2	349/13,344	2.6	2,116/18,255	11.6
Unknown	77/3,169	2.4	29/750	3.9	164/1,520	10.8
Educational level*						
High	328/39,217	0.8	113/18,035	0.6	3,093/28,775	10.7
Low/medium	593/18,141	3.3	399/10,147	3.9	1,385/11,920	11.6
Unknown	85/3,672	2.3	27/1,232	2.2	355/3,171	11.2
Number of partners in past 6 months						
0 partners	5/487	1.0	1/222	0.5	28/386	7.3
1 partner	258/16,068	1.6	87/5,368	1.6	234/3,359	7.0
2 partners	259/15,669	1.7	135/6,056	2.2	359/4,389	8.2
3 or more partners	435/26,585	1.6	313/17,577	1.8	4,127/35,007	11.8
Unknown	49/2,221	2.2	3/191	1.6	85/725	11.7
Receptive anal sex, in past 6 months						
No receptive anal sex	698/46,521	1.5			828/11,240	7.4
Yes, consistently with a condom	31/1,545	2.0			630/7,676	8.2
Yes, not consistently with a condom	249/10,548	2.4			3,211/23,088	13.9
Unknown	28/2,416	1.2			164/1,862	8.8
Insertive anal sex, in past 6 months						
No insertive anal sex			395/21,939	1.8	656/8,045	8.2
Yes, consistently with a condom			6/601	1.0	713/8,557	8.3
Yes, not consistently with a condom			73/3,119	2.3	3,309/25,468	13.0
Unknown			65/3,755	1.7	155/1,796	8.6

Table 4.3b (continued) Number of positive tests and persons tested for gonorrhoea by demographics, (sexual) behavioural characteristics, gender and type of sexual contact, 2018

	Women		Heterosexual men		MSM	
	n positive/N	%	n positive/N	%	n positive/N	%
Vaginal sex, in past 6 months**						
No vaginal sex	8/568	1.4	4/295	1.4	59/746	7.9
Yes, consistently with a condom	64/4,541	1.4	29/2,007	1.4	75/944	7.9
Yes, not consistently with a condom	919/54,236	1.7	495/26,389	1.9	227/4,180	5.4
Unknown	15/1,685	0.9	11/723	1.5	55/865	6.4
Receptive oral sex, in past 6 months						
No receptive oral sex	109/6,982	1.6			155/2,084	7.4
Yes, consistently with a condom	20/1,331	1.5			32/446	7.2
Yes, not consistently with a condom	835/48,914	1.7			4,415/38,842	11.4
Unknown	42/3,803	1.1			231/2,494	9.3
Client of sex worker						
No	884/49,775	1.8	500/26,770	1.9	4,722/42,164	11.2
Yes, in past 6 months	3/143	2.1	34/2,083	1.6	83/1,366	6.1
Unknown	119/11,112	1.1	5/561	0.9	28/336	8.3
Previous HIV test						
No	574/41,510	1.4	316/20,163	1.6	343/4,906	7.0
Yes, positive	1/36	2.8	0/15	0.0	862/4,770	18.1
Yes, negative	402/17,788	2.3	206/8,366	2.5	3,612/33,965	10.6
Yes, result unknown	3/104	2.9	0/24	0.0	6/54	11.1
Unknown	26/1,592	1.6	17/846	2.0	10/171	5.8

* Low/medium level of education: no education, elementary school, lbo, mavo, vmbo, mbo; high level of education: havo, vwo, university of applied sciences, university.

** For MSM: numbers are reported for men who had sex with both men and women (N=6,735). Men who had sex with men only are excluded.

Table 4.4 Concurrent STI among persons diagnosed with gonorrhoea by gender and type of sexual contact, 2018

Concurrent infection	Women (N=1,006) n (%)	Heterosexual men (N=539) n (%)	MSM (N=4,833) n (%)
Chlamydia	395 (39.3)	252 (46.8)	969 (20.0)
Syphilis, infectious	0 (0.0)	0 (0.0)	169 (3.5)
HIV newly diagnosed	0 (0.0)	2 (0.4)	46 (1.0)
Genital herpes	4 (0.4)	1 (0.2)	15 (0.3)
Genital warts	4 (0.4)	9 (1.7)	40 (0.8)
Hepatitis B, infectious	0 (0.0)	1 (0.2)	2 (0.0)
Hepatitis C	0 (0.0)	0 (0.0)	10 (0.2)

Footnote: SHC check for genital herpes and genital warts on indication only. In addition, clients are not routinely tested on hepatitis C.

Table 4.5 Number and percentage of positive tests for gonorrhoea by anatomic location, gender and type of sexual contact, 2018

Location	Women n positive (%)	Heterosexual men n positive (%)	MSM n positive (%)
Urogenital	791 (1.3)	534 (1.8)	1,176 (2.7)
Anorectal	322 (1.5)	7 (3.1)	3,271 (7.7)
Oral	299 (1.4)	0 (0.0)	2,445 (5.7)

Footnote 1: Heterosexual men are usually only tested urogenital, while women are tested on indication for anorectal or oral gonorrhoea; indications vary by region. MSM are usually tested in all three locations.

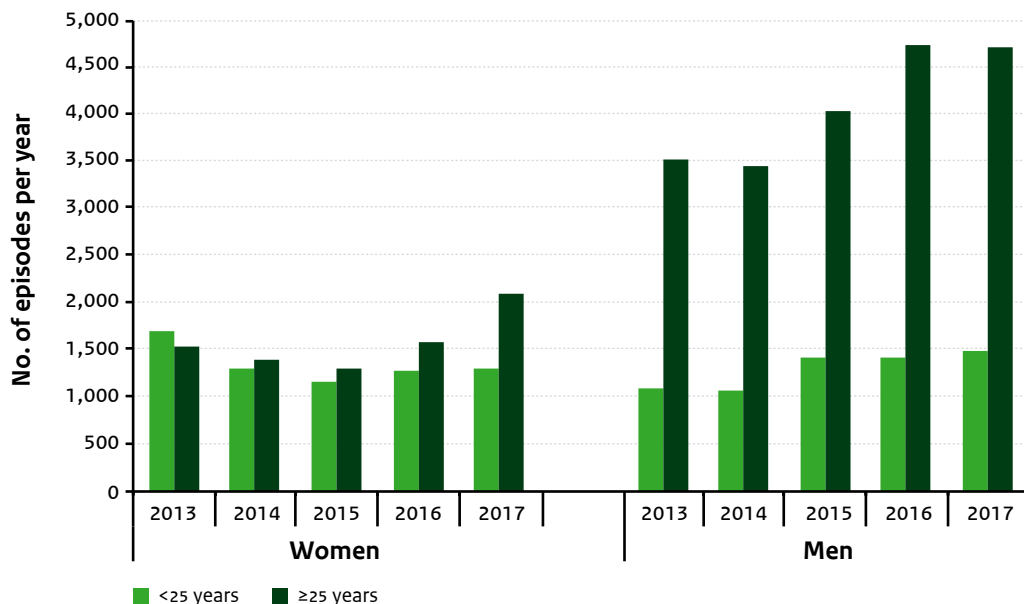
Footnote 2: Please note that people can have positive tests at multiple locations.

Table 4.6 Anatomic location of gonorrhoea infection by gender and type of sexual contact, 2018

Location	Women (N=1,006) n (%)	Heterosexual men (N=539) n (%)	MSM (N=4,833) n (%)
Urogenital only	470 (46.7)	532 (98.7)	276 (5.7)
Anorectal only	68 (6.8)	5 (0.9)	1,605 (33.2)
Oral only	137 (13.6)	0 (0.0)	1,201 (24.8)
Urogenital and anorectal	169 (16.8)	2 (0.4)	507 (10.5)
Urogenital and oral	77 (7.7)	0 (0.0)	85 (1.8)
Anorectal and oral	10 (1.0)	0 (0.0)	851 (17.6)
Urogenital and anorectal and oral	75 (7.5)	0 (0.0)	308 (6.4)

4.3 General practitioner

Figure 4.6 Estimated annual number of reported episodes of gonorrhoea at GPs by gender and age group, based on extrapolation from GP practices in Nivel-PCD, 2013-2017



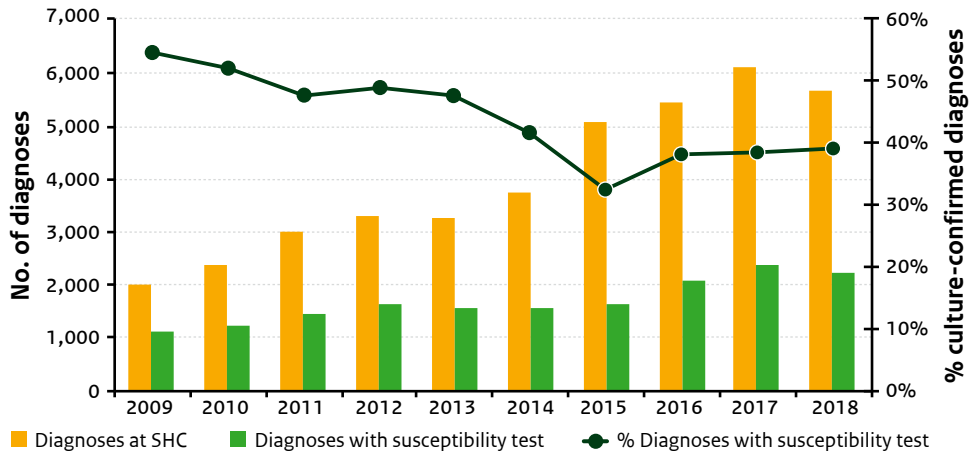
Footnote: About 70% of the total Dutch population consists of persons aged ≥ 25 years and about 30% consists of persons aged < 25 years.

Table 4.7 Annual reporting rate (number of episodes per 1,000 population) of gonorrhoea at GPs in the Netherlands by gender and age group, based on GP practices in Nivel-PCD, 2013-2017

	Women n/1,000			Men n/1,000			Total n/1,000		
	All	<25	≥ 25	All	<25	≥ 25	All	<25	≥ 25
2013	0.4	0.7	0.3	0.6	0.4	0.6	0.5	0.6	0.4
2014	0.3	0.5	0.2	0.5	0.4	0.6	0.4	0.5	0.4
2015	0.3	0.5	0.2	0.7	0.6	0.7	0.5	0.5	0.4
2016	0.3	0.5	0.3	0.7	0.6	0.8	0.5	0.5	0.5
2017	0.4	0.5	0.3	0.7	0.6	0.8	0.6	0.6	0.6

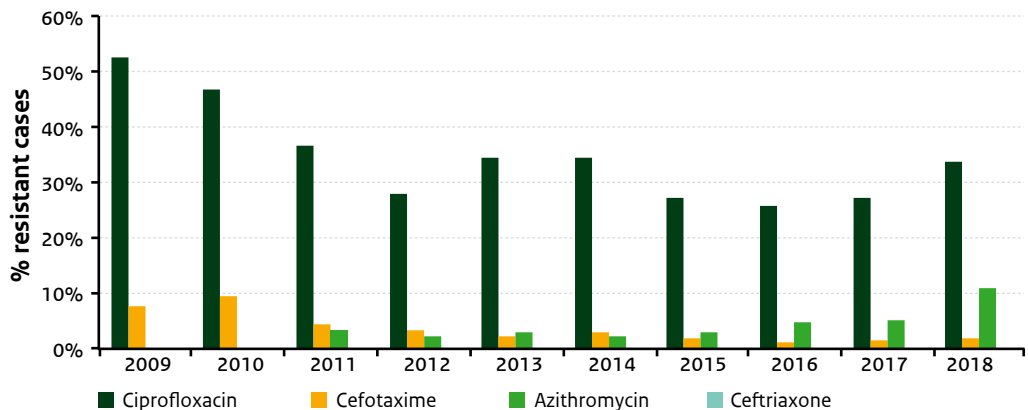
4.4 Antimicrobial resistance of gonococci in the Netherlands

Figure 4.7 Number of gonorrhoea diagnoses and number and percentage of diagnoses including an antimicrobial susceptibility test at SHC participating in GRAS, 2009-2018



Footnote: In less than half of all gonorrhoea diagnoses at SHC, antimicrobial susceptibility was measured by culture. This can partially be explained by negative cultures, making measurement of resistance levels impossible. Furthermore, the STI register data show that gonorrhoea diagnoses are sometimes only confirmed by PCR, not by culture.

Figure 4.8 Gonococcal resistance (following Eucast breakpoints) in the Netherlands, proportion of resistant cases 2009-2018



Source: GRAS, SHC

Footnote 1: In 2019, EUCAST changed the definition for azithromycin resistance. Trends for azithromycin have retrospectively been altered based on the new MIC breakpoint.

Footnote 2: In 2011, ceftriaxone and azithromycin were added to the panel.

Footnote 3: No resistance to ceftriaxone has been reported yet.

Figure 4.9a MIC (= minimum inhibitory concentration) distribution for ceftriaxone, 2011-2018

		MIC							
		<=0.002	0.004	0.008	0.016	0.032	0.064	0.125	>0.125
Year	2011	33.9	14.8	11.1	28.8	7.9	2.9	0.6	0.0
	2012	44.3	24.6	11.2	9.3	6.8	3.5	0.3	0.0
	2013	31.5	25.4	12.5	14.5	9.1	6.0	0.9	0.0
	2014	28.3	28.7	18.3	10.9	6.2	6.8	0.7	0.0
	2015	37.8	32.5	13.8	6.3	5.3	3.4	0.9	0.0
	2016	44.0	31.1	8.3	7.3	5.7	2.9	0.6	0.0
	2017	48.2	26.6	11.3	7.2	4.1	2.0	0.6	0.0
	2018	44.9	27.8	12.4	7.8	4.4	2.1	0.7	0.0

Source: GRAS, SHC

Footnote: Following EUCAST criteria, an MIC of >0.125 mg/L is considered resistant. However, in clinical practice this value is set to >0.12 mg/L, as an MIC of 0.125 mg/L cannot be measured with Etest.

Figure 4.9b MIC (= minimum inhibitory concentration) distribution for azithromycin, 2011-2018

		MIC								
		<=0.016	0.032	0.064	0.125	0.250	0.500	1.00	2.00	>=3.00
Year	2011	5.5	8.7	12.6	19.8	26.7	19.3	4.0	1.3	2.1
	2012	10.1	11.4	16.2	27.3	22.8	6.4	3.7	1.1	1.0
	2013	4.0	7.0	11.7	26.5	35.4	8.8	3.8	1.5	1.4
	2014	2.2	6.3	10.9	25.1	31.5	16.3	5.5	1.9	0.3
	2015	3.6	5.8	10.8	28.8	25.9	13.6	8.3	2.4	0.8
	2016	3.8	6.3	15.9	27.6	22.2	10.5	9.2	3.6	1.1
	2017	2.5	5.4	12.9	26.6	25.4	12.2	9.9	3.9	1.2
	2018	1.2	3.8	12.6	26.9	22.7	9.7	12.2	7.1	3.7

Source: GRAS, SHC

Footnote: Following EUCAST breakpoints, an MIC of >1.0 mg/L is considered resistant.

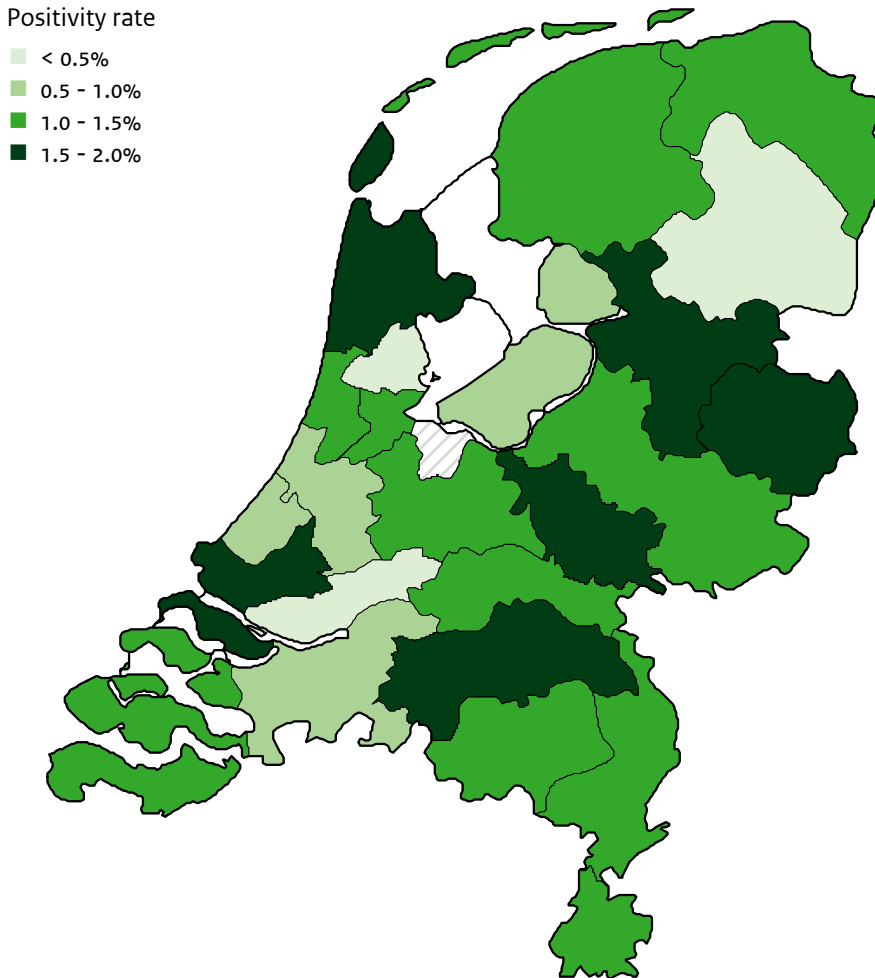
5 Syphilis

5.1 Key points

- In 2018, 1,224 clients (96.1% MSM, 2.1% heterosexual men, 1.8% women) were diagnosed with infectious syphilis at SHC in the Netherlands.
- The number of diagnoses of infectious syphilis has remained stable over the past three years: 1,223 in 2016, 1,228 in 2017 and 1,224 in 2018.
- The percentage of positive tests for infectious syphilis among MSM dropped from 2.8% to 2.0% from 2009 - 2011 but has increased from 2013 (2.0%) to 2.9% in 2016, starting 2017, the percentage decreased to 2.4% in 2018.
- The number of tests among women (n=28,786) and heterosexual men (n=16,906) has decreased compared to 2017 (30,842 and 19,335 tests respectively). The number of syphilis diagnoses among heterosexual men was 30 in 2017 and 26 in 2018; among women this decreased from 28 in 2017 to 22 in 2018.
- In 2018, 141 (11.5%) syphilis diagnoses were not registered in the national database. The following key points are based on registered consultations only.
- The decrease in positivity rate among MSM was mainly due to the decrease in HIV-positive MSM (from 8.4% in 2016 to 6.6% in 2018). The syphilis rates among HIV-negative MSM appears stable: 2.0% in 2016 and 1.8% in 2018.
- Among MSM, sub-groups with relatively higher positivity rates included those notified for syphilis exposure (11.4%, n=186), known HIV-positive (6.6%; n=312), those with STI related symptoms (6.3%; n=491) and those with an STI diagnosed in the past year (3.8%; n=423).
- Of the MSM diagnosed with infectious syphilis, 19.0% had a co-infection with chlamydia and 16.2% had a co-infection with gonorrhoea.
- The number of infections of congenital syphilis found in neonates has remained very low, at 0 to 3 per year since 2009 (1 in 2018).

5.2 Sexual Health Centres: characteristics, risk groups and trends

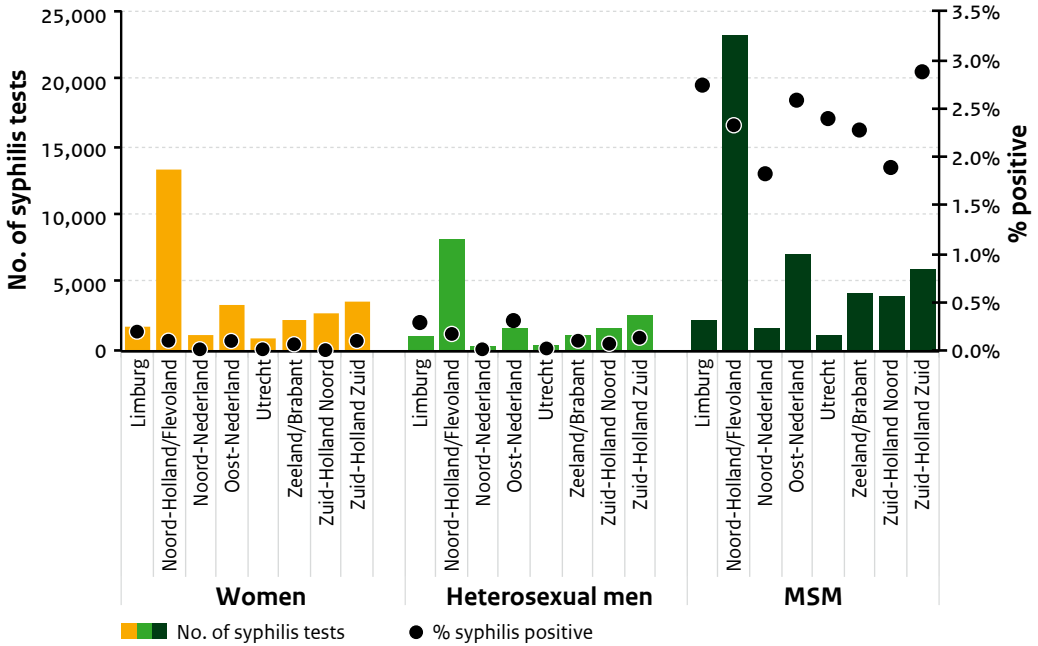
Figure 5.1 Positivity rates of infectious syphilis by region, the Netherlands, 2018



Footnote 1: GGD Gooien Vechtstreek (grey striped region) does not have an SHC. Hence, no STI data were available for this region.

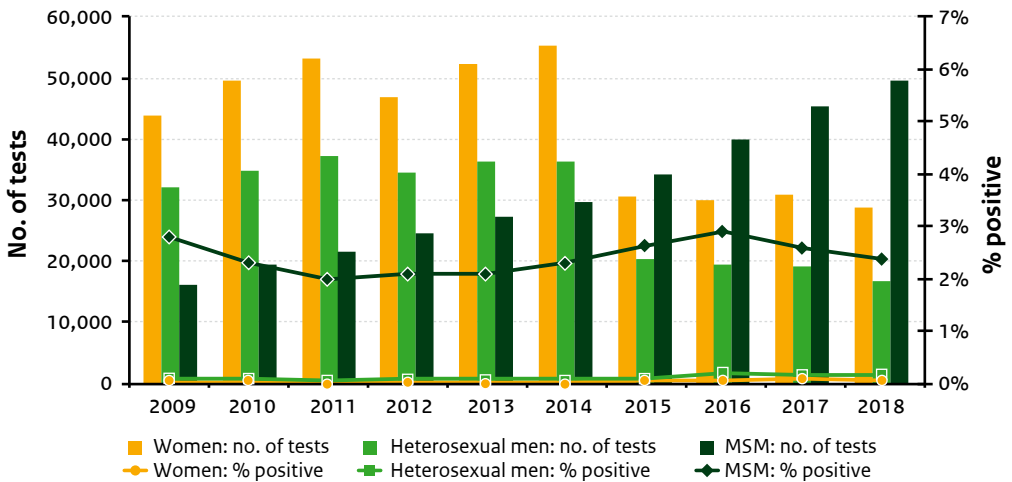
Footnote 2: Aggregated data of non-registered consultations included.

Figure 5.2 Number of syphilis tests and percentage of syphilis positives by region, gender and type of sexual contact, 2018



Footnote: Aggregated data of non-registered consultations included.

Figure 5.3 Total number of tests and positivity rate of infectious syphilis by gender and type of sexual contact, 2009-2018



Footnote: Aggregated data of non-registered consultations included.

Table 5.1 Number of positive tests and persons tested for infectious syphilis by age, gender and type of sexual contact, 2018

Age (years)	Women		Heterosexual men		MSM	
	n positive/N	%	n positive/N	%	n positive/N	%
≤19	1/1,648	0.06	3/467	0.64	23/919	2.50
20-24	3/8,769	0.03	3/4,673	0.06	108/6,078	1.78
25-29	3/7,139	0.04	7/4,970	0.14	179/8,187	2.19
30-34	0/2,838	0.00	1/2,178	0.05	132/6,386	2.07
35-39	1/1,501	0.07	1/961	0.10	135/4,792	2.82
40-44	2/944	0.21	1/464	0.22	103/4,157	2.48
45-49	2/930	0.22	2/367	0.54	115/3,990	2.88
50-54	2/754	0.27	1/241	0.41	109/3,765	2.90
≥ 55	3/557	0.54	2/300	0.67	141/5,392	2.61
Total	17/25,080	0.07	21/14,621	0.14	1,045/43,668	2.39

Figure 5.4 Percentage of positive syphilis tests in MSM by HIV status, 2009-2018

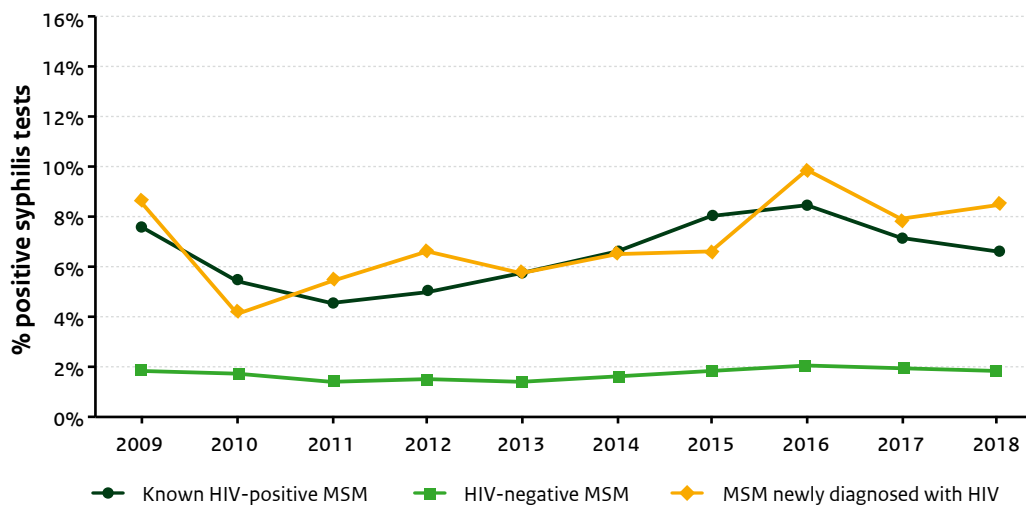


Table 5.2a Number of positive tests and persons tested for infectious syphilis by migration background, gender and type of sexual contact, 2018

Migration background	Women		Heterosexual men		MSM	
	n positive/N	%	n positive/N	%	n positive/N	%
Ethnic Dutch	15/13,809	0.11	13/6,812	0.19	647/29,398	2.20
Western migrants	0/4,312	0.00	0/1,741	0.00	163/6,618	2.46
First generation non-Western migrants	1/3,376	0.03	4/2,854	0.14	159/5,081	3.13
Second generation non-Western migrants	1/3,538	0.03	4/3,191	0.13	76/2,540	2.99
Non-Western, generation unknown	0/5	0.00	0/3	0.00	0/4	0.00
Unknown	0/40	0.00	0/20	0.00	0/27	0.00
Total	32/38,889	0.08	34/23,174	0.15	1,692/73,066	2.32

Table 5.2b Number of positive tests and persons tested for infectious syphilis among first and second generation migrants from an STI/HIV endemic area by region of origin, gender and type of sexual contact, 2018

Region of origin	MSM	
	n positive/N	%
Turkey	21/733	2.86
North Africa/Morocco	19/639	2.97
Suriname	41/1,259	3.26
Netherlands Antilles/Aruba	32/974	3.29
Eastern Europe	37/1,200	3.08
Sub-Saharan Africa	7/547	1.28
Latin America	67/1,482	4.52
Asia	76/3,019	2.52
Total	300/9,853	3.04

Table 5.3a Number of positive tests and persons tested for infectious syphilis among MSM by triage indication, 2018

	MSM	
	n positive/N	%
Notified		
Not notified	716/35,602	2.0
Notified for syphilis	186/1,632	11.4
Notified for other STI/HIV	131/5,947	2.2
Unknown	12/487	2.5
Symptoms		
No	551/35,774	1.5
Yes	491/7,844	6.3
Unknown	3/50	6.0
STI/HIV endemic area		
No	745/33,815	2.2
Yes	300/9,853	3.0
Age <25 years		
No	914/36,669	2.5
Yes	131/6,997	1.9
Partner in risk group*		
No	628/27,567	2.3
Yes	400/15,363	2.6
Unknown	17/738	2.3
Sex worker		
No	1,081/42,598	2.5
Yes, in past 6 months	21/771	2.7
Unknown	6/299	2.0
Gonorrhoea/chlamydia/syphilis in past year		
Not tested	237/13,285	1.8
Tested, negative	356/17,396	2.0
Tested, positive	423/11,201	3.8
Tested, unknown	8/271	3.0
Unknown	21/1,515	1.4

* Partner originating from a high STI/HIV endemic country.

Table 5.3b Number of positive tests and persons tested for infectious syphilis among MSM by demographics and (sexual) behavioural characteristics, 2018

	MSM	
	n positive/N	%
Socioeconomic status		
High	274/13,407	2.0
Medium	265/10,568	2.5
Low	467/18,178	2.6
Unknown	39/1,515	2.6
Educational level*		
High	585/28,664	2.0
Low/medium	359/11,837	3.0
Unknown	101/3,167	3.2
Number of partners in past 6 months		
0 partners	7/384	1.8
1 partner	66/3,335	2.0
2 partners	95/4,367	2.2
3 or more partners	857/34,862	2.5
Unknown	20/720	2.8
Receptive anal sex, in past 6 months		
No receptive anal sex	183/11,186	1.6
Yes, consistently with a condom	94/7,654	1.2
Yes, not consistently with a condom	735/22,962	3.2
Unknown	33/1,866	1.8
Insertive anal sex, in past 6 months		
No insertive anal sex	162/7,989	2.0
Yes, consistently with a condom	115/8,532	1.3
Yes, not consistently with a condom	743/25,346	2.9
Unknown	25/1,801	1.4
Vaginal sex, in past 6 months**		
No vaginal sex	20/743	2.7
Yes, consistently with a condom	16/940	1.7
Yes, not consistently with a condom	50/4,149	1.2
Unknown	11/869	1.3

Table 5.3b (continued) Number of positive tests and persons tested for infectious syphilis among MSM by demographics and (sexual) behavioural characteristics, 2018

	MSM	
	n positive/N	%
Receptive oral sex, in past 6 months		
No receptive oral sex	36/2,069	1.7
Yes, consistently with a condom	6/444	1.4
Yes, not consistently with a condom	963/38,655	2.5
Unknown	40/2,485	1.6
Client of sex worker		
No	1,014/41,968	2.4
Yes, in past 6 months	24/1,365	1.8
Unknown	7/335	2.1
Previous HIV test		
No	67/4,868	1.4
Yes, positive	312/4,721	6.6
Yes, negative	664/33,851	2.0
Yes, result unknown	0/53	0.0
Unknown	2/175	1.1

* Low/medium level of education: no education, elementary school, lbo, mavo, vmbo, mbo; high level of education: havo, vwo, university of applied sciences, university.

** Numbers are reported for men who had sex with both men and women (N=6,701). Men who had sex with men only are excluded.

Table 5.4 Concurrent STI by gender and type of sexual contact among persons diagnosed with infectious syphilis, 2018

Concurrent infection	Women (N=2) n (%)	Heterosexual men (N=4) n (%)	MSM (N=411) n (%)
Chlamydia	2 (11.8)	4 (19.1)	199 (19.0)
Gonorrhoea	0 (0.0)	0 (0.0)	169 (16.2)
HIV newly diagnosed	0 (0.0)	0 (0.0)	17 (1.6)
Genital herpes	0 (0.0)	0 (0.0)	11 (1.1)
Genital warts	0 (0.0)	0 (0.0)	8 (0.8)
Hepatitis B, infectious	0 (0.0)	0 (0.0)	3 (0.3)
Hepatitis C	0 (0.0)	0 (0.0)	4 (0.4)

Footnote: SHC check for genital herpes and genital warts on indication only. In addition, clients are not routinely tested on hepatitis C.

5.3 Antenatal screening

Table 5.5 Syphilis prevalence estimates in pregnant women, based on test results of antenatal screening, 2013-2017

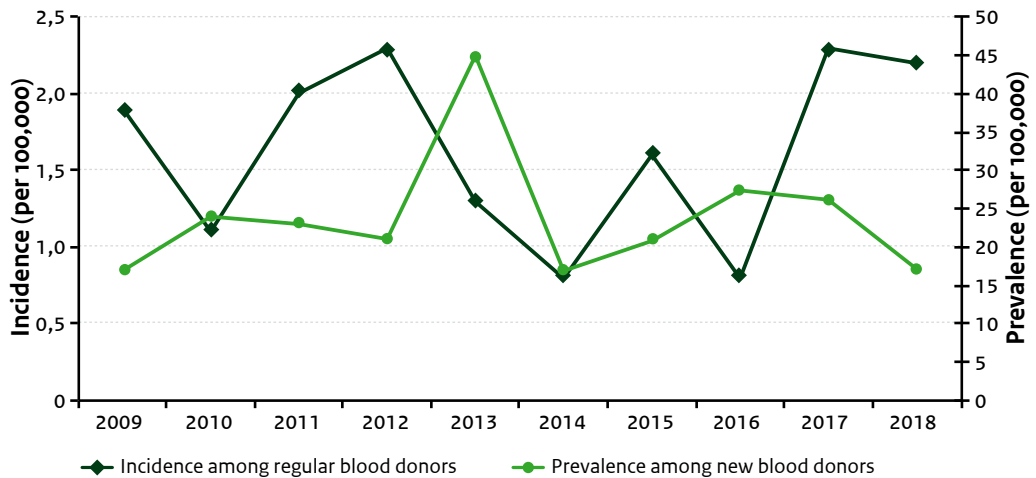
Year	No. of women screened	Confirmed positive test results	Prevalence estimate
2013	176,070	135	0.08
2014	174,610	97	0.06
2015	176,219	98	0.06
2016	172,785	36	0.02
2017	170,453	25	0.01

Sources: C.P.B. van der Ploeg (TNO), P. Oomen (RIVM), K. Vos (RIMV). Prenatale Screening Infectieziekten en Erytrocytenimmunisatie (PSIE). Procesmonitor 2017. TNO/RIVM 2019; and earlier monitors.

Footnote: Stricter classification of confirmed positive test results in 2016 and 2017 resulted in less confirmed positive test results as compared to previous years.

5.4 Blood donors

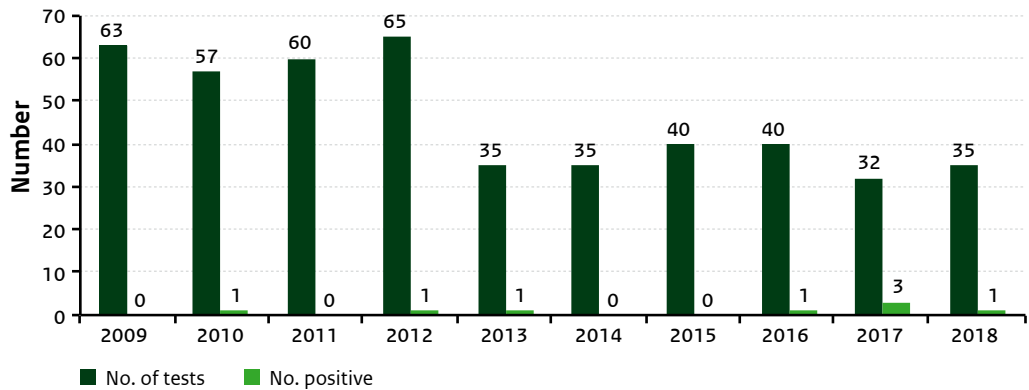
Figure 5.5 Syphilis incidence and prevalence (per 100,000) among regular and new blood donors in the Netherlands, 2009-2018



Source: Sanquin

5.5 Congenital syphilis

Figure 5.6 Number of tests among neonates and young infants (<1 year) suspected of being infected with congenital syphilis and the number of IgM positives. 2009-2018



Source: RIVM/Cib/IDS

VIRAL STI

6 HIV and AIDS

6.1 Key points

6.1.1 Sexual Health Centres

- In 2018, 249 individuals were newly diagnosed with HIV at SHC in the Netherlands (90% MSM). Among MSM, 224 HIV infections were diagnosed; a decrease compared to the number of HIV infections in 2017 (256) and 2016 (264).
- Of all diagnoses, 25 (10.0%) were not registered in the national database. The following key points are based on registered consultations only.
- Among heterosexual men and women, 21 of the 23 (91%) persons newly diagnosed with HIV originated from an STI/HIV endemic country.
- The positivity rate among MSM has been decreasing for years; from 2.4% in 2009 to 0.5% in 2018.
- The highest positivity rates were found among MSM notified for HIV (5.6%). In addition, higher rates were found among first generation non-Western immigrants MSM (1.5%) – in particular among MSM originating from Latin America (2.2%).

6.1.2 HIV treatment centres

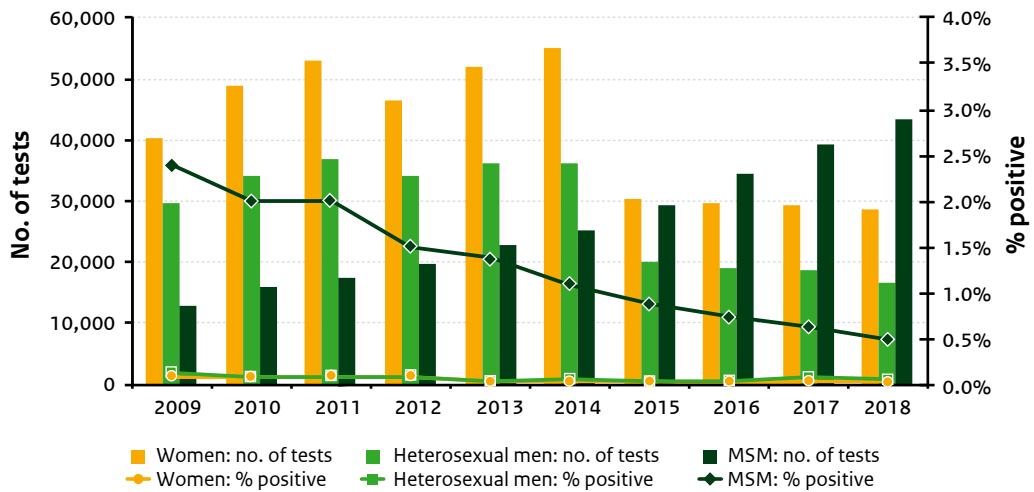
- In total, 20,181 HIV patients were reported in clinical care as of December 2018.
- In 2018, 909 new HIV patients were reported in care (1,037 in 2017). Of newly registered patients, 527 were diagnosed in 2018 (incomplete due to reporting delay). The proportion of MSM (69%) was comparable to 2017 (68%). The proportion of heterosexuals (males and females) was 21 % in 2018 (25% in 2017).
- Of HIV-positive MSM entering care and diagnosed in 2018, 42% were diagnosed at SHC, 35% at GPs, and 17% in hospitals. Of heterosexual males, 46% were diagnosed in hospitals, 44% by GPs, and 9% at SHC. Of heterosexual women, 35% were diagnosed in hospitals, 33% by GPs, 13% through pregnancy screening, and 13% at SHC.
- Of patients diagnosed in 2018, 25% had a newly acquired HIV infection (<6 months). This proportion was 28% for MSM and 5% for heterosexual men and women.
- Of patients diagnosed in 2018, 48% presented late (CD4<350/mm³, or AIDS-defining event regardless of CD4 count). This proportion was lower for MSM (44%) than for women (59%) and heterosexual men (68%).
- In 2017, approximately 90% of people infected with HIV were estimated to have been diagnosed and linked to care. Of these people, 93% had started combination antiretroviral therapy (cART) and 95% had a suppressed viral load. Among MSM, these were 91%, 95%, and 96% respectively.

6.1.3 General practice

- At GPs, an estimated number of 17,798 prevalent HIV cases were reported in 2017; a reporting rate of 1.4 per 1,000 population. Reporting rates were higher in men than in women (2.1 versus 0.6/1,000).

6.2 Sexual Health Centres: characteristics, risk groups and trends

Figure 6.1 Total number of tests and positivity rate of new HIV cases by gender and type of sexual contact, 2009-2018



Footnote: Aggregated data of non-registered consultations included.

Table 6.1 Number of positive tests and persons tested for HIV by age, gender and type of sexual contact, 2018

Age (years)	Women		Heterosexual men		MSM	
	n positive/N	%	n positive/N	%	n positive/N	%
≤19	0/1,638	0.00	0/466	0.00	6/908	0.66
20-24	4/8,746	0.05	1/4,664	0.02	24/5,940	0.40
25-29	2/7,125	0.03	3/4,960	0.06	44/7,719	0.57
30-34	1/2,832	0.04	0/2,173	0.00	39/5,745	0.68
35-39	2/1,495	0.13	2/958	0.21	14/4,101	0.34
40-44	3/939	0.32	2/460	0.43	24/3,520	0.68
45-49	0/927	0.00	0/362	0.00	19/3,282	0.58
50-54	1/749	0.13	0/241	0.00	14/2,987	0.47
≥ 55	0/551	0.00	2/295	0.68	17/4,506	0.38
Total	13/25,002	0.05	10/14,579	0.07	201/38,708	0.52

Footnote: In addition, 6 transgender persons were newly diagnosed with HIV. Age was unknown for 1 MSM.

Table 6.2a Number of positive tests and persons tested for HIV by migration background, gender and type of sexual contact, 2018

Migration background	Women		Heterosexual men		MSM	
	n positive/N	%	n positive/N	%	n positive/N	%
Ethnic Dutch	2/13,774	0.01	0/6,797	0.00	103/26,449	0.39
Western migrants	0/4,308	0.00	0/1,734	0.00	25/5,723	0.44
First generation non-Western migrants	9/3,354	0.27	8/2,844	0.28	64/4,190	1.53
Second generation non-Western migrants	2/3,521	0.06	2/3,181	0.06	9/2,324	0.39
Non-Western, generation unknown	0/45	0.00	0/23	0.00	0/3	0.00
Unknown	0/0	0.00	0/0	0.00	0/20	0.00
Total	13/25,002	0.05	10/14,579	0.07	201/38,709	0.52

Table 6.2b Number of positive tests and MSM tested for HIV among first and second generation migrants from an STI/HIV endemic area by region of origin, 2018

Region of origin	MSM	
	n positive/N	%
Turkey	3/677	0.44
North Africa/Morocco	6/583	1.03
Suriname	14/1,033	1.36
Netherlands Antilles/Aruba	9/808	1.11
Eastern Europe	13/982	1.32
Sub-Saharan Africa	6/481	1.25
Latin America	25/1,135	2.20
Asia	13/2,689	0.48
Total	89/8,388	1.06

Table 6.3a Number of positive tests and persons tested for HIV among MSM by triage indication, 2018

	MSM	
	n positive/N	%
Notified		
Not notified	129/32,058	0.4
Notified for syphilis	25/447	5.6
Notified for other STI/HIV	43/5,785	0.7
Unknown	4/419	1.0
Symptoms		
No	144/32,185	0.4
Yes	57/6,475	0.9
Unknown	0/49	0.0
STI/HIV endemic area		
No	112/30,321	0.4
Yes	89/8,388	1.1
Age <25 years		
No	171/31,861	0.5
Yes	30/6,848	0.4

Table 6.3a (continued) Number of positive tests and persons tested for HIV among MSM by triage indication, 2018

	MSM	
	n positive/N	%
Partner in risk group*		
No	92/24,608	0.4
Yes	105/13,439	0.8
Unknown	4/662	0.6
Sex worker		
No	197/37,773	0.5
Yes, in past 6 months	1/674	0.1
Unknown	3/262	1.1
Gonorrhoea/chlamydia/syphilis in past year		
Not tested	101/12,473	0.8
Tested, negative	57/15,776	0.4
Tested, positive	35/8,843	0.4
Tested, unknown	1/227	0.4
Unknown	7/1,390	0.5

* Partner originating from a high STI/HIV endemic country.

Table 6.3b Number of positive tests and persons tested for HIV among MSM by demographics and (sexual) behavioural characteristics, 2018

	MSM	
	n positive/N	%
Socioeconomic status		
High	57/11,807	0.5
Medium	52/9,492	0.5
Low	75/16,062	0.5
Unknown	17/1,348	1.3
Educational level*		
High	105/25,679	0.4
Low/medium	66/10,328	0.6
Unknown	30/2,702	1.1

Table 6.3b (continued) Number of positive tests and persons tested for HIV among MSM by demographics and (sexual) behavioural characteristics, 2018

	MSM	
	n positive/N	%
Number of partners in past 6 months		
0 partners	5/328	1.5
1 partner	23/3,066	0.8
2 partners	30/3,974	0.8
3 or more partners	141/30,753	0.5
Unknown	2/588	0.3
Receptive anal sex, in past 6 months		
No receptive anal sex	19/10,618	0.2
Yes, consistently with a condom	26/7,189	0.4
Yes, not consistently with a condom	148/19,208	0.8
Unknown	8/1,681	0.5
Insertive anal sex, in past 6 months		
No insertive anal sex	27/7,340	0.4
Yes, consistently with a condom	20/8,071	0.2
Yes, not consistently with a condom	146/21,660	0.7
Unknown	8/1,625	0.5
Vaginal sex, in past 6 months**		
No vaginal sex	6/706	0.8
Yes, consistently with a condom	9/892	1.0
Yes, not consistently with a condom	13/4,068	0.3
Unknown	1/826	0.1
Receptive oral sex, in past 6 months		
No receptive oral sex	12/1,912	0.6
Yes, consistently with a condom	1/409	0.2
Yes, not consistently with a condom	182/34,115	0.5
Unknown	6/2,260	0.3
Client of sex worker		
No	191/37,162	0.5
Yes, in past 6 months	5/1,265	0.4
Unknown	5/282	1.8

Table 6.3b (continued) Number of positive tests and persons tested for HIV among MSM by demographics and (sexual) behavioural characteristics, 2018

	MSM	
	n positive/N	%
Previous HIV test		
No	26/4,838	0.5
Yes, positive	NA	NA
Yes, negative	170/33,643	0.5
Yes, result unknown	3/46	6.5
Unknown	2/174	1.1

NA: not applicable

* Low/medium level of education: no education, elementary school, lbo, mavo, vmbo, mbo; high level of education: havo, vwo, university of applied sciences, university.

** Numbers are shown for men who had sex with both men and women (N=6,448).

Table 6.4 Concurrent STI by gender and type of sexual contact among persons newly diagnosed with HIV at the Sexual Health Centres, 2018

Concurrent infection	Women (N=13) n (%)	Heterosexual men (N=10) n (%)	MSM (N=201) n (%)
Chlamydia	2 (15.4)	1 (10.0)	52 (25.9)
Gonorrhoea	0 (0.0)	2 (20.0)	46 (22.9)
Syphilis, infectious	0 (0.0)	0 (0.0)	17 (8.5)
Genital herpes	1 (7.7)	0 (0.0)	2 (1.0)
Genital warts	0 (0.0)	0 (0.0)	0 (0.0)
Hepatitis B, infectious	0 (0.0)	0 (0.0)	5 (2.5)
Hepatitis C	0 (0.0)	0 (0.0)	2 (1.0)

Footnote: SHC check for genital herpes and genital warts on indication only. In addition, clients are not routinely tested on hepatitis C.

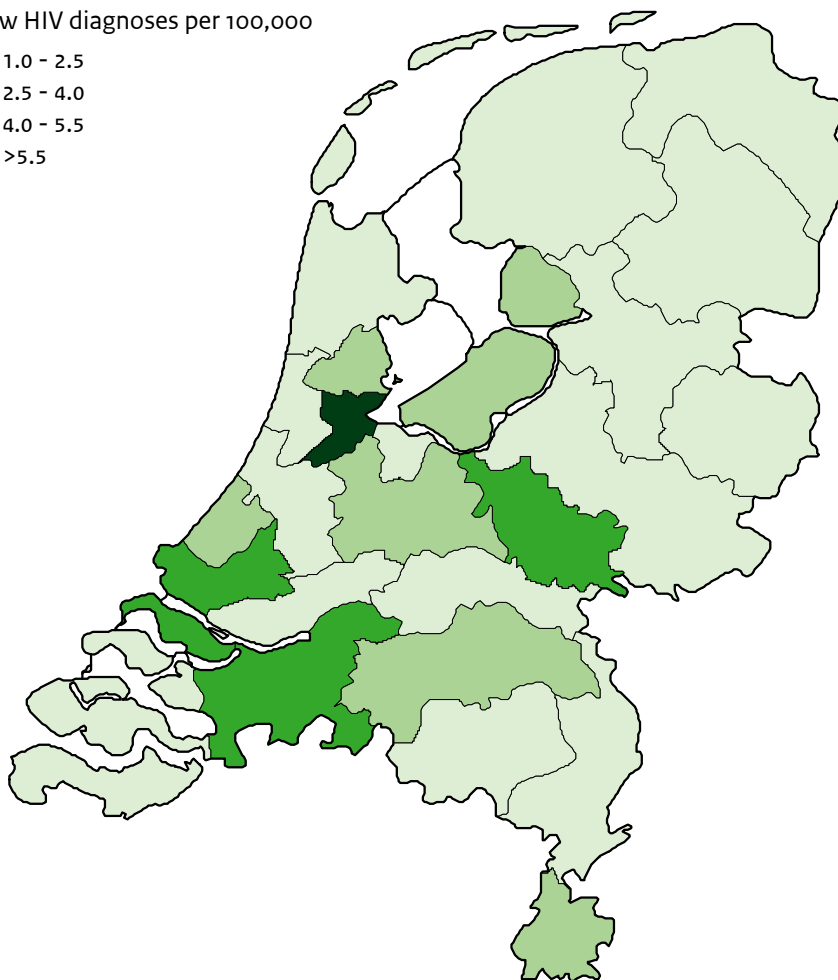
6.3 HIV treatment centres

6.3.1 Newly diagnosed HIV cases in care in 2018

Figure 6.2 Number of new HIV diagnoses per 100,000 inhabitants by region, the Netherlands, 2018

New HIV diagnoses per 100,000

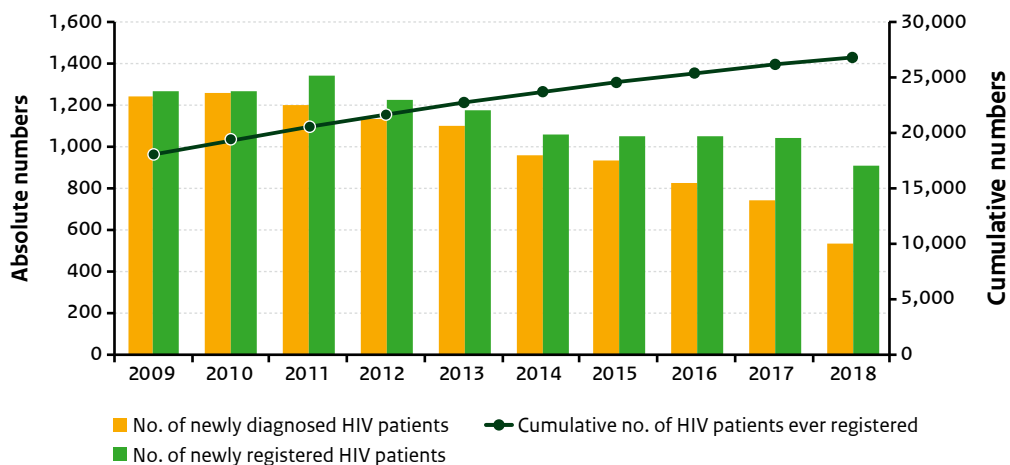
- 1.0 - 2.5
- 2.5 - 4.0
- 4.0 - 5.5
- >5.5



Sources: Stichting HIV Monitoring, CBS

Footnote: GGD Amsterdam = 12.5 per 100,000 inhabitants

Figure 6.3 Number of newly diagnosed HIV cases and newly registered HIV patients by year, 2007-2018



Source: Stichting HIV Monitoring, 2018 incomplete

Table 6.5a Number of HIV patients diagnosed in 2018 by age and main transmission category, as of December 31, 2018

Age (years)	Women (%)	Heterosexual men (%)	MSM (%)	Other/unknown*
0-14	0 (0.0)	0 (0.0)	0 (0.0)	1 (1.8)
15-19	4 (7.3)	0 (0.0)	3 (0.8)	3 (5.5)
20-24	5 (9.1)	2 (3.7)	29 (8.0)	0 (0.0)
25-29	12 (21.8)	7 (13.0)	59 (16.3)	10 (18.2)
30-39	16 (29.1)	15 (27.8)	92 (25.3)	8 (14.5)
40-49	10 (18.2)	14 (25.9)	92 (25.3)	16 (29.1)
50-59	5 (9.1)	11 (20.4)	67 (18.5)	5 (9.1)
60-69	3 (5.5)	4 (7.4)	18 (5.0)	7 (12.7)
70-79	0 (0.0)	1 (1.9)	3 (0.8)	5 (9.1)
≥ 80	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Total	55	54	363	55

* Injecting drug use, blood and blood contacts, mother-to-child transmission, other, unknown.

Table 6.5b Number of HIV patients in care, by age at diagnosis and main transmission category, as of December 31, 2018

Age (years)	Women (%)	Heterosexual men (%)	MSM (%)	Other/unknown*
0-14	3 (0.1)	0 (0.0)	7 (0.1)	335 (19.4)
15-19	151 (4.6)	32 (1.3)	212 (1.7)	43 (2.5)
20-24	460 (14.1)	162 (6.6)	1,094 (8.6)	137 (7.9)
25-29	710 (21.7)	289 (11.7)	1,973 (15.5)	218 (12.6)
30-39	1,109 (33.9)	852 (34.5)	4,403 (34.6)	449 (25.9)
40-49	480 (14.7)	663 (26.8)	3,252 (25.5)	289 (16.7)
50-59	253 (7.7)	337 (13.6)	1,380 (10.8)	146 (8.4)
60-69	69 (2.1)	115 (4.7)	350 (2.7)	58 (3.4)
70-79	16 (0.5)	14 (0.6)	44 (0.3)	15 (0.9)
≥ 80	0 (0.0)	1 (0.0)	1 (0.0)	0 (0.0)
Unknown	23 (0.7)	8 (0.3)	21 (0.2)	41 (2.4)
Total	3,274	2,473	12,737	1,731

* Injecting drug use, blood and blood contacts, mother-to-child transmission, other, unknown.

Table 6.6 Number of HIV cases diagnosed in 2018 and number of HIV patients in care by gender and main reported transmission risk group, as of December 31, 2018

Transmission risk group	Women		Men		Total	
	2018 (%)	Total in care (%)	2018 (%)	Total in care (%)	2018 (%)	Total in care (%)
MSM	-	-	363 (78.4)	12,737 (77.5)	363 (68.9)	12,737 (63.1)
Heterosexual contact	55 (85.9)	3,274 (87.5)	54 (11.7)	2,473 (15.0)	109 (20.7)	5,747 (28.5)
Injecting drug use	1 (1.6)	81 (2.2)	1 (0.2)	206 (1.3)	2 (0.4)	287 (1.4)
Blood or blood products	4 (6.3)	92 (2.5)	6 (1.3)	161 (1.0)	10 (1.9)	253 (1.3)
Mother to child	0 (0.0)	160 (4.3)	2 (0.4)	150 (0.9)	2 (0.4)	310 (1.5)
Other/unknown	4 (6.3)	133 (3.6)	37 (8.0)	714 (4.3)	41 (7.8)	847 (4.2)
Total	64	3,740	463	16,441	527	20,181

Table 6.7a Number of HIV cases diagnosed in 2018 by region of origin and main transmission category, as of December 31, 2018

Region of origin	Women n (%)	Heterosexual men n (%)	MSM n (%)	Other/unknown* n (%)
The Netherlands	23 (41.8)	35 (64.8)	217 (59.8)	28 (50.9)
Europe, other	5 (9.1)	4 (7.4)	42 (11.6)	7 (12.7)
Caribbean & Latin America	9 (16.4)	6 (11.1)	51 (14.0)	9 (16.4)
Sub-Saharan Africa	16 (29.1)	6 (11.1)	14 (3.9)	7 (12.7)
Other	2 (3.6)	2 (3.7)	35 (9.6)	4 (7.3)
Unknown	0 (0.0)	1 (1.9)	4 (1.1)	0 (0.0)
Total	55	54	363	55

* Injecting drug use, blood and blood contacts, mother-to-child transmission, other, unknown.

Table 6.7b Number of HIV patients in care by region of origin and main transmission group, as of December 31, 2018

Region of origin	Women n (%)	Heterosexual men n (%)	MSM n (%)	Other/unknown* n (%)
The Netherlands	973 (29.7)	1,170 (47.3)	9,049 (71.0)	792 (46.7)
Europe, other	156 (4.8)	168 (6.8)	1,229 (9.6)	216 (12.7)
Caribbean & Latin America	492 (15.0)	346 (14.0)	1,367 (10.7)	131 (7.7)
Sub-Saharan Africa	1,373 (41.9)	662 (26.8)	176 (1.4)	411 (24.2)
Other	271 (8.3)	120 (4.9)	862 (6.8)	144 (8.5)
Unknown	9 (0.3)	7 (0.3)	54 (0.4)	3 (0.2)
Total	3,274	2,473	12,737	1,697

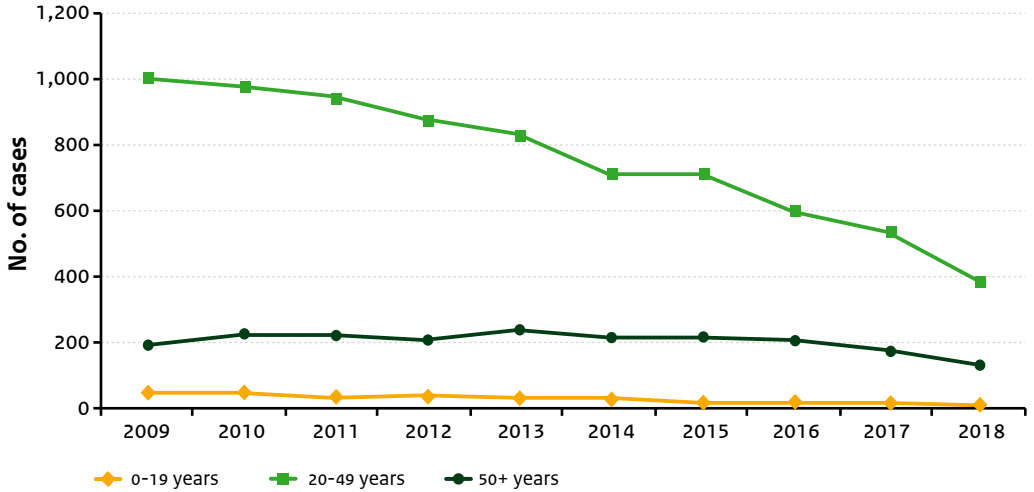
* Injecting drug use, blood and blood contacts, mother-to-child transmission, other, unknown.

Table 6.8 Number of HIV cases diagnosed in 2018 by test location and main transmission category, as of December 31, 2018

Test location	Women n (%)	Heterosexual men n (%)	MSM n (%)	Other/unknown* n (%)
PHS/SHC	7 (12.7)	5 (9.3)	151 (41.6)	4 (7.3)
Hospital	19 (34.5)	25 (46.3)	60 (16.5)	30 (54.5)
General practitioner	18 (32.7)	24 (44.4)	126 (34.7)	19 (34.5)
Pregnancy screening	7 (12.7)	0 (0.0)	0 (0.0)	1 (1.8)
Other/unknown	4 (7.3)	0 (0.0)	26 (7.2)	1 (1.8)
Total	55	54	363	55

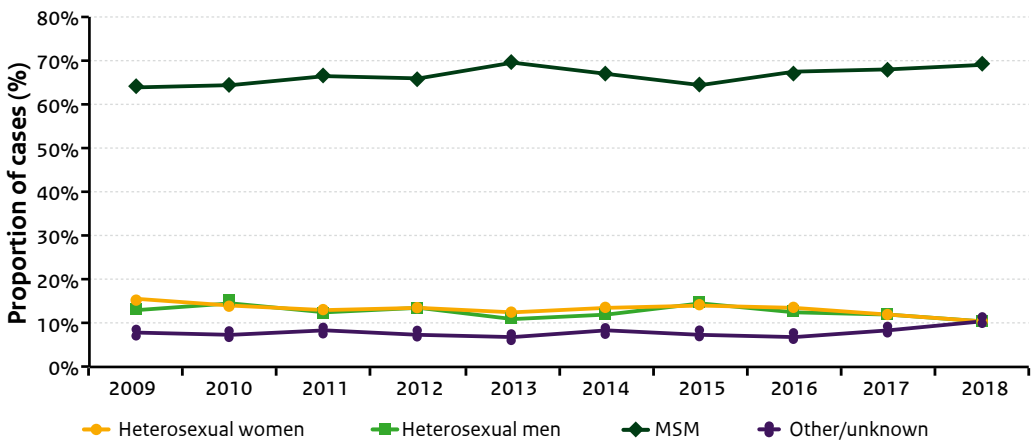
* Injecting drug use, blood and blood contacts, mother-to-child transmission, other, unknown.

Figure 6.4 Number of newly diagnosed HIV cases by age group and year of diagnosis, 2009-2018



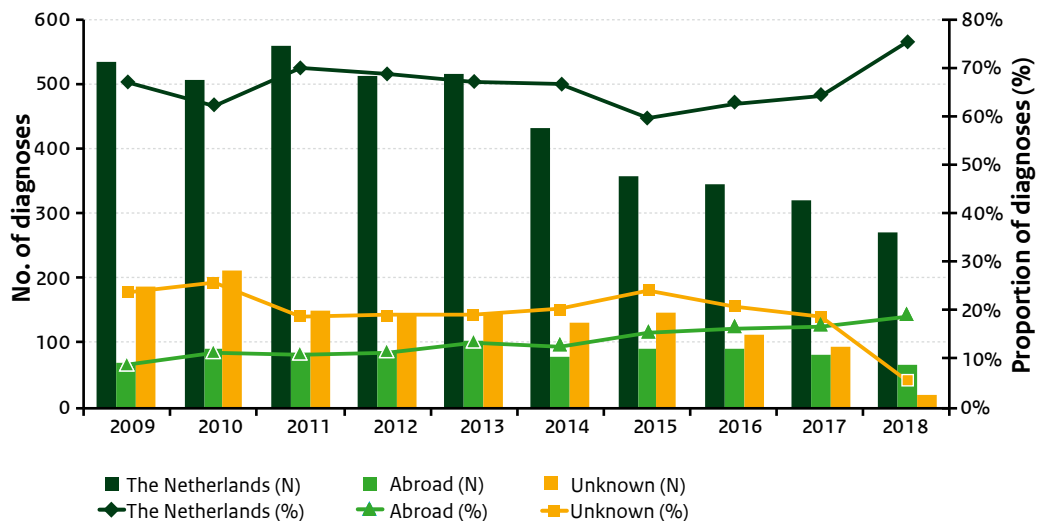
Source: Stichting HIV Monitoring, 2018 incomplete

Figure 6.5 Proportion of newly diagnosed HIV cases, by main transmission group and year of diagnosis, 2009-2018



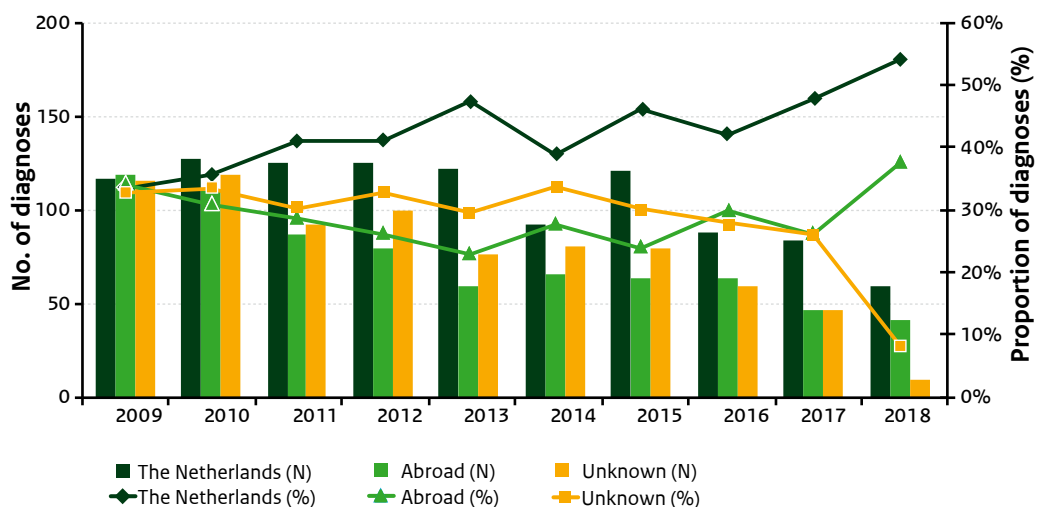
Source: Stichting HIV Monitoring, 2018 incomplete

Figure 6.6a Reported country of HIV infection of newly diagnosed MSM by year of diagnosis, 2009-2018



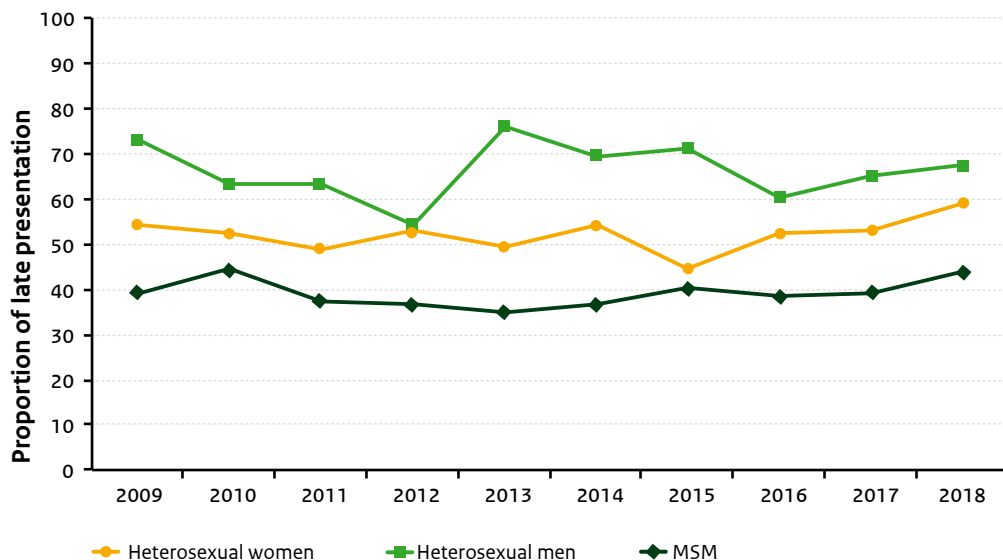
Source: Stichting HIV Monitoring, 2018 incomplete

Figure 6.6b Reported country of newly diagnosed HIV-positive heterosexuals by year of diagnosis, 2009-2018



Source: Stichting HIV Monitoring, 2018 incomplete

Figure 6.7 Proportion of late presentation (CD4 count <350/mm³ or AIDS at diagnosis) by transmission risk group, 2009-2018



Source: Stichting HIV Monitoring, 2018 incomplete

6.3.2 AIDS cases and deaths among HIV patients

Table 6.9 Number of AIDS patients by year of AIDS diagnosis and transmission risk group, 2009-2018

Year of diagnosis	Women n (%)	Heterosexual men n (%)	MSM n (%)	Other/unknown* n (%)
2009	44 (14.3)	73 (23.7)	153 (49.7)	38 (12.3)
2010	63 (19.7)	68 (21.3)	145 (45.5)	43 (13.5)
2011	47 (17.7)	43 (16.2)	131 (49.4)	44 (16.6)
2012	51 (17.2)	58 (19.6)	148 (50.0)	39 (13.2)
2013	38 (14.4)	49 (18.6)	138 (52.5)	38 (14.4)
2014	30 (14.0)	47 (21.9)	104 (48.4)	34 (15.8)
2015	33 (13.6)	50 (20.7)	118 (48.8)	41 (16.9)
2016	38 (18.5)	41 (20.0)	95 (46.3)	31 (15.1)
2017	30 (19.6)	31 (20.3)	65 (42.5)	27 (17.6)
2018	9 (10.2)	13 (14.8)	49 (55.7)	17 (19.3)

Source: Stichting HIV Monitoring, 2018 incomplete

* injecting drug use, blood and blood contacts, mother-to-child transmission, other, unknown.

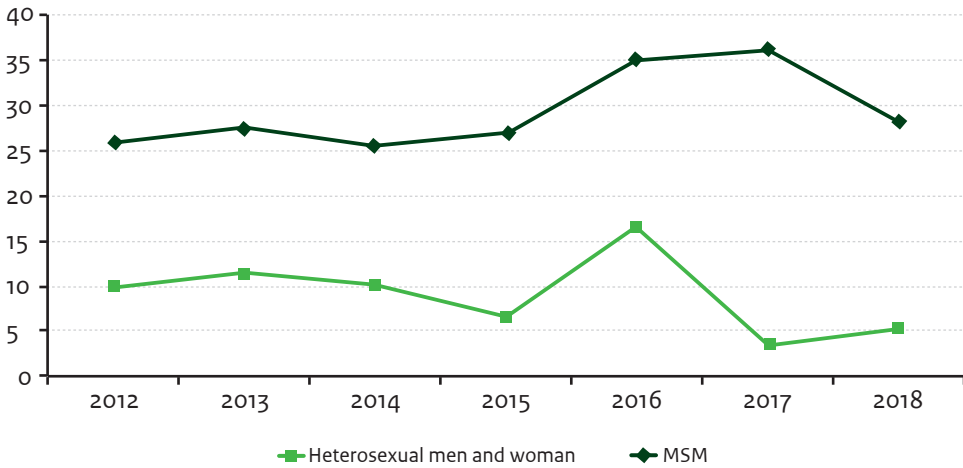
Erratum

Report 2019-0007

Sexually transmitted infections in the Netherlands in 2018

Figure 6.7a is shown below (Chapter 6 HIV and AIDS); this figure is missing in the printed version of the report.

Figure 6.7a Proportion of newly acquired HIV infections (< 6 months) by transmission risk group, 2012-2018

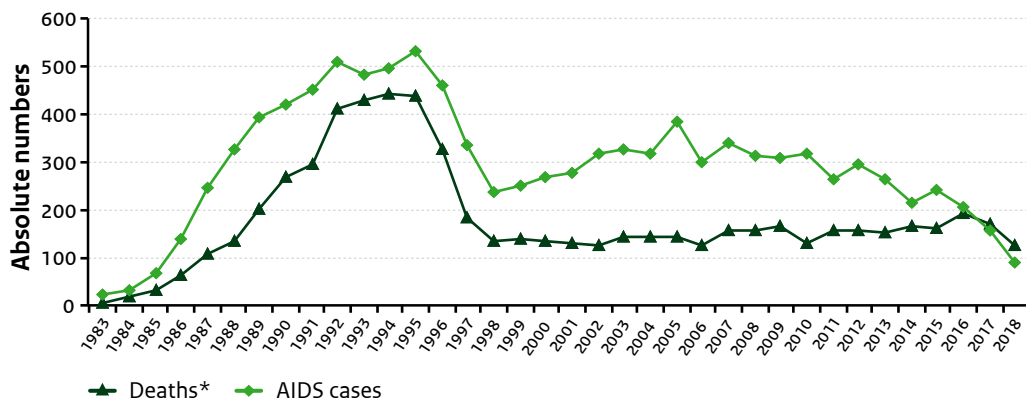


Source: Stichting HIV Monitoring, 2018 incomplete

For approval, 14-06-2019

Birgit van Benthem
Head STI department

Figure 6.8 Number of AIDS cases and deaths among HIV patients, 1983-2018



Sources: AIDS cases < 1999: AIDS registration Health Inspectorate, ≥ 1999: Stichting HIV Monitoring.
 Deaths < 2002: CBS, ≥ 2002: Stichting HIV Monitoring, 2018 incomplete.
 * Total deaths among HIV patients, not only caused by HIV/AIDS.

Table 6.10 Number of deaths among people with HIV/AIDS by year of death and transmission risk group, 2009-2018

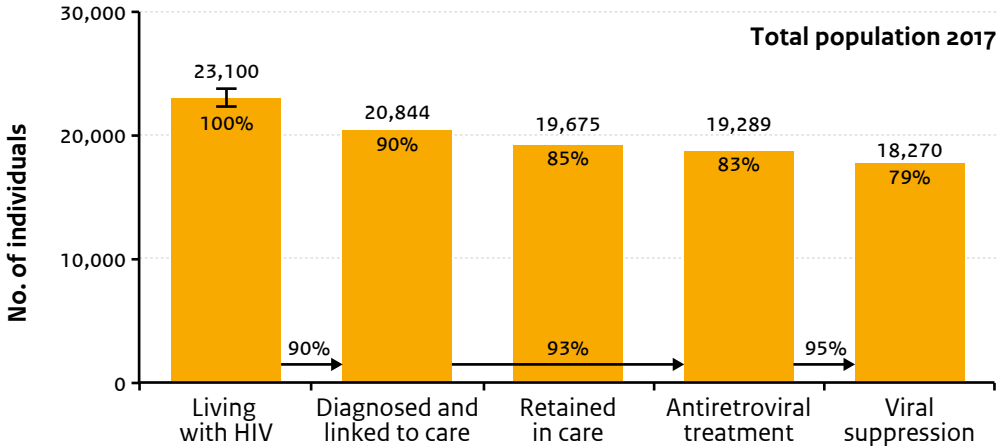
Year of death	Women n (%)	Heterosexual men n (%)	MSM n (%)	Other/unknown* n (%)
2009	13 (7.9)	27 (16.5)	83 (50.6)	41 (25.0)
2010	16 (12.2)	16 (12.2)	64 (48.9)	35 (26.7)
2011	13 (8.4)	32 (20.8)	77 (50.0)	32 (20.8)
2012	9 (5.7)	27 (17.1)	88 (55.7)	34 (21.5)
2013	12 (8.0)	31 (20.7)	80 (53.3)	27 (18.0)
2014	19 (11.5)	26 (15.8)	88 (53.3)	32 (19.4)
2015	20 (12.4)	38 (23.6)	76 (47.2)	27 (16.8)
2016	20 (10.5)	35 (18.4)	96 (50.5)	39 (20.5)
2017	9 (5.3)	33 (19.4)	91 (53.5)	37 (21.8)
2018	7 (5.6)	15 (12.0)	82 (65.6)	21 (16.8)

Source: Stichting HIV Monitoring, 2018 incomplete

* Injecting drug use, blood and blood contacts, mother-to-child transmission, other, unknown.

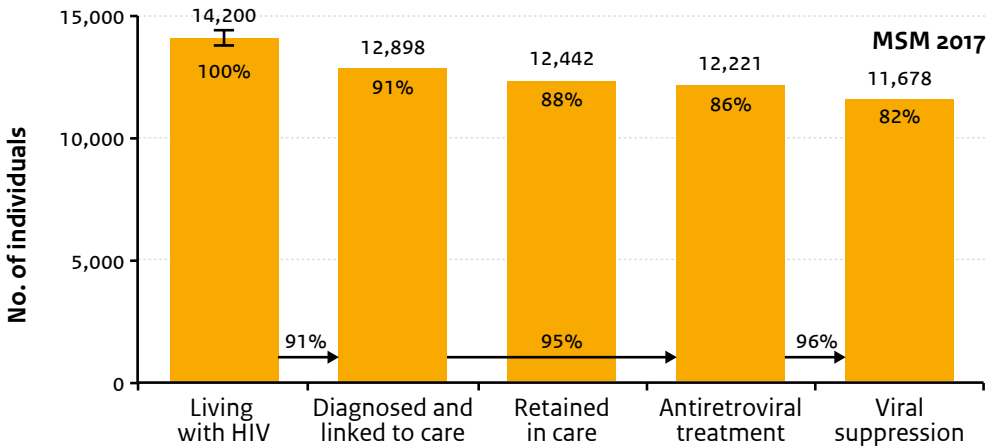
Footnote: Deaths, not only caused by HIV/AIDS

Figure 6.9a Continuum of care for HIV in 2017, total population, Stichting HIV Monitoring



Source: Stichting HIV Monitoring, Monitoring Report 2018 SHM: Monitoring of Human Immunodeficiency Virus (HIV) Infection in the Netherlands. See for details: www.hiv-monitoring.nl

Figure 6.9b Continuum of care for HIV in 2017, MSM, Stichting HIV Monitoring



Source: Stichting HIV Monitoring, Monitoring Report 2018 SHM: Monitoring of Human Immunodeficiency Virus (HIV) Infection in the Netherlands. See for details: www.hiv-monitoring.nl

6.4 Other sources

6.4.1 Antenatal screening

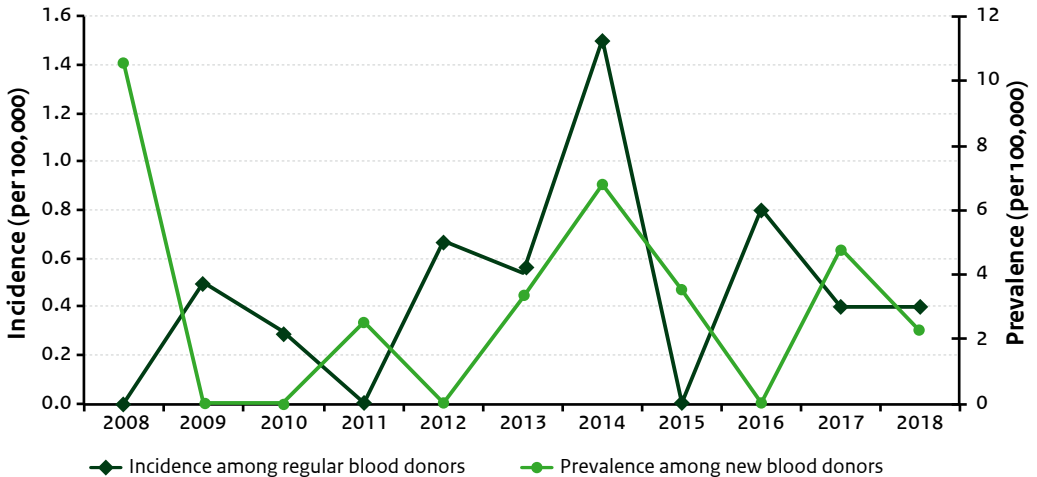
Table 6.11 HIV prevalence estimates in pregnant women, based on test results of antenatal screening, 2013-2017

Year	No. of women screened	Confirmed positive test results	Prevalence estimate
2013	176,008	99	0.06
2014	174,566	100	0.06
2015	176,103	105	0.06
2016	172,694	88	0.05
2017	170,390	112	0.07

Sources: C.P.B. van der Ploeg (TNO), P. Oomen (RIVM), K. Vos (RIMV). Prenatale Screening Infectieziekten en Erytrocytenimmunisatie (PSIE). Procesmonitor 2017. TNO/RIVM 2019; and earlier monitors.

6.4.2 Blood donors

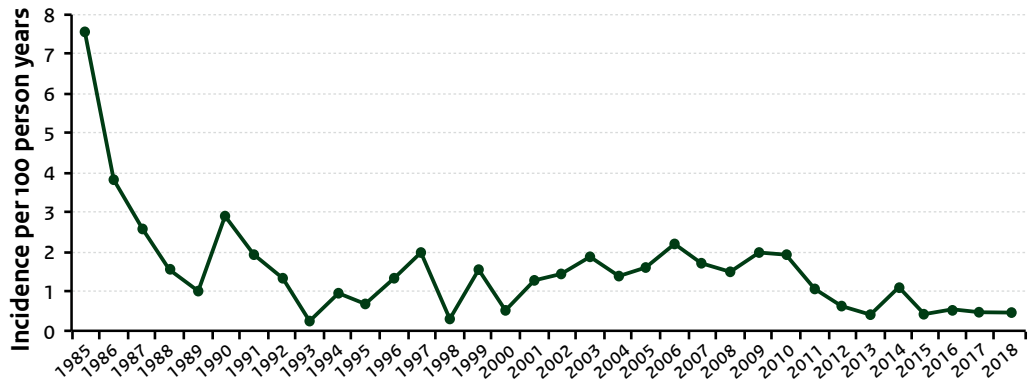
Figure 6.10 HIV incidence and prevalence (per 100,000) among regular blood donors in the Netherlands, 2008-2018



Source: Sanquin

6.4.3 Amsterdam Cohort Studies

Figure 6.11 Yearly HIV incidence among MSM in Amsterdam Cohort Studies, 1985-2018



6.5 General practice

Figure 6.12 Estimated number of prevalent HIV-cases at GPs by gender, based on extrapolation from GP practices in Nivel-Primary Care Database, 2009-2017

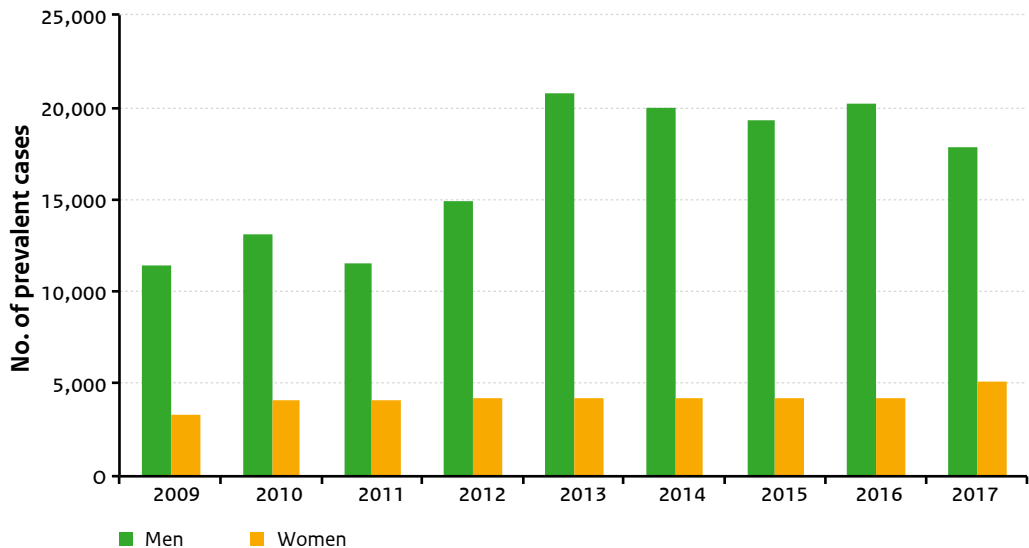


Table 6.12 Estimated prevalence of HIV (rate per 1,000 population) at GPs in the Netherlands by gender, based on GP practices in Nivel-PCD, 2009-2017

	Women n/1,000	Men n/1,000	Total n/1,000
2009	0.4	1.4	0.9
2010	0.5	1.6	1.0
2011	0.5	1.4	0.9
2012	0.5	1.8	1.1
2013	0.5	2.5	1.5
2014	0.5	2.5	1.5
2015	0.5	2.3	1.4
2016	0.5	2.4	1.4
2017	0.6	2.1	1.3

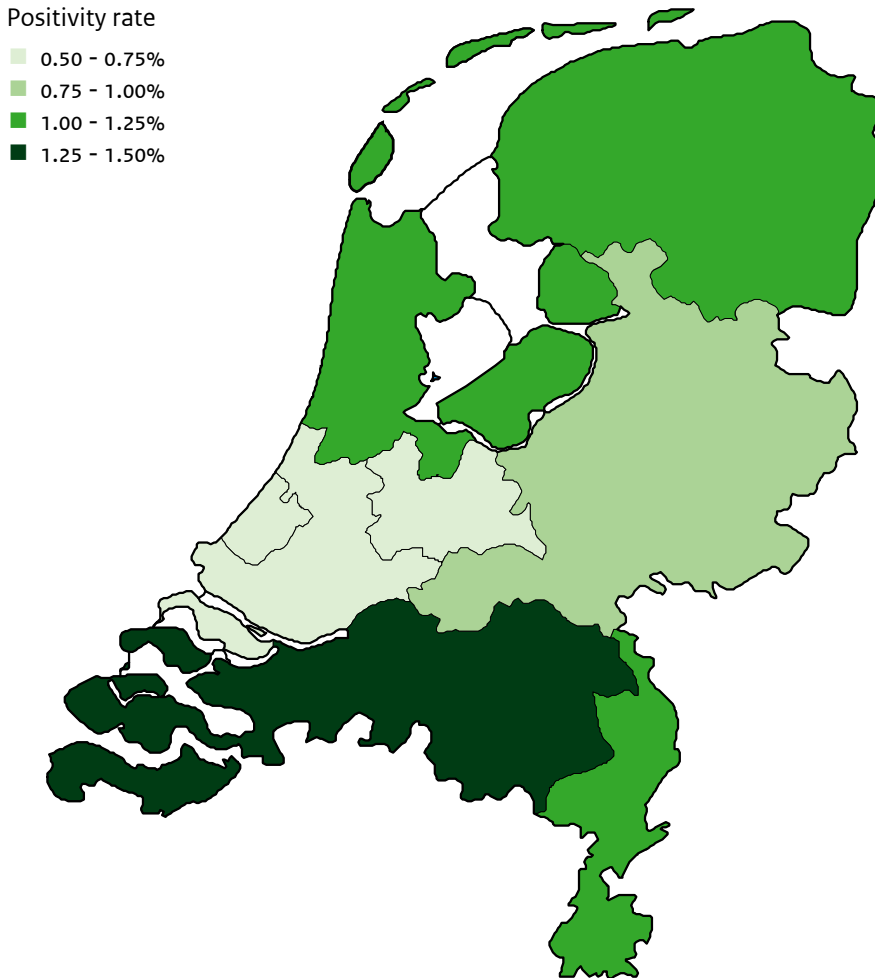
7 Genital warts

7.1 Key points

- In 2018, the number of genital warts diagnoses at SHC was 1,314 among the registered consultations in the national database; 33.3% in women, 44.4% in heterosexual men, and 22.4% in MSM.
- The positivity rate in 2018 was higher among heterosexual men (2.0%) than among women and MSM (both 0.7%).
- Among women and MSM, the positivity rate has declined since 2009. Among heterosexual men, the positivity rate has been relatively stable since 2013.
- At GPs, the number of genital warts episodes, estimated from the Nivel-PCD, was 42,000 in 2017, with a reporting rate of 2.5 per 1,000 population (in 2016: 2.3 per 1,000 population). The reporting rate was higher for men than for women (2.9 versus 2.0/1,000). Among men, the reporting rate was higher in the ≥ 25 age group (3.3/1,000) compared to the < 25 age group (1.8/1,000).

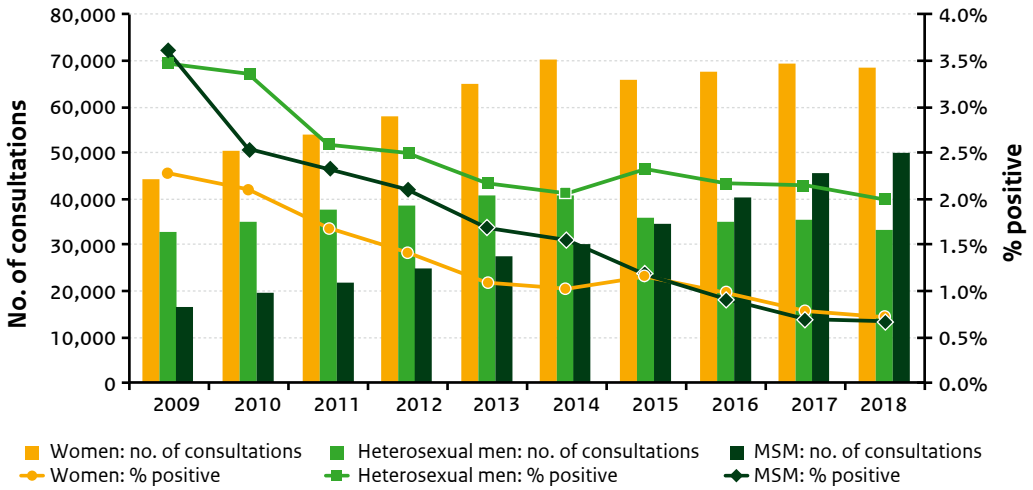
7.2 Sexual Health Centres: characteristics, risk groups and trends

Figure 7.1 Positivity rates of genital warts by region, the Netherlands, 2018



Footnote: SHC check for genital warts on indication only. Positivity rate was estimated by dividing the number of genital warts diagnoses by the total number of registered consultations.

Figure 7.2 Total number of STI consultations and positivity rate of genital warts by gender and type of sexual contact, 2009-2018



Footnote: SHC check for genital warts on indication only. Number of consultations based on registered consultations and aggregated data of non-registered consultations. The positivity rate was estimated by dividing the number of genital warts diagnoses by the total number of registered consultations.

Table 7.1 Number of people diagnosed with genital warts and number of STI consultations by age, gender and type of sexual contact, 2018

Age (years)	Women		Heterosexual men		MSM	
	n positive/N	%	n positive/N	%	n positive/N	%
≤24	340/43,240	0.8	334/18,200	1.8	64/7,081	0.9
≥ 25	97/17,880	0.5	249/11,254	2.2	230/36,929	0.6
Total	437/61,120	0.7	583/29,454	2.0	294/44,012	0.7

Footnote: SHC check for genital warts on indication only. Positivity rate was estimated by dividing the number of genital warts diagnoses by the total number of registered consultations.

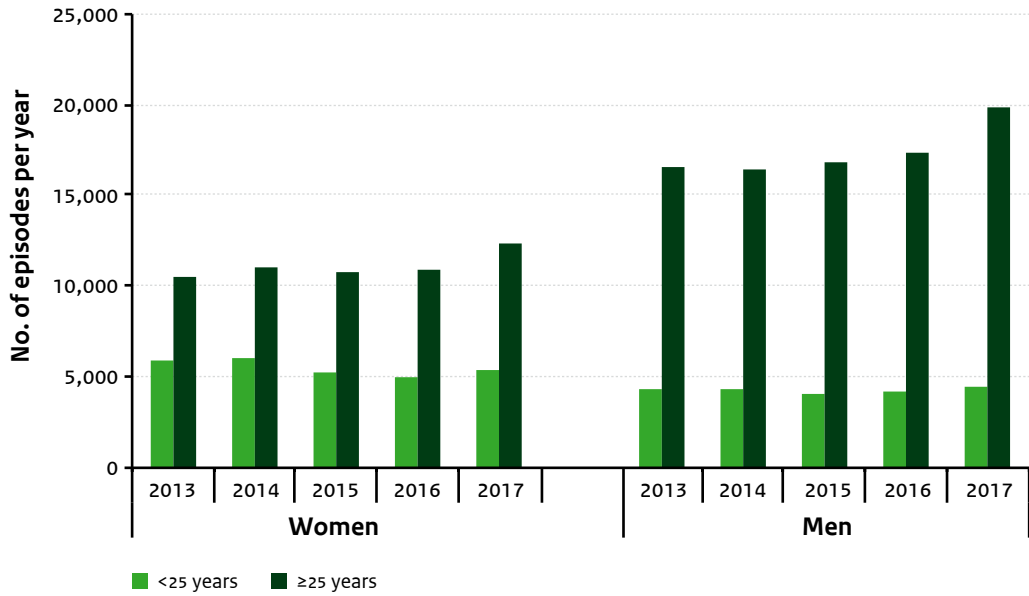
Table 7.2 Number of people diagnosed with genital warts and number of STI consultations by migration background, gender and type of sexual contact, 2018

Migration background	Women		Heterosexual men		MSM	
	n positive/N	%	n positive/N	%	n positive/N	%
Ethnic Dutch	343/44,110	0.8	373/18,414	2.0	186/29,662	0.6
Western migrants	37/6,867	0.5	52/2,722	1.9	53/6,652	0.8
First generation non-Western migrants	19/3,670	0.5	50/3,074	1.6	35/5,111	0.7
Second generation non-Western migrants	37/6,425	0.6	108/5,219	2.1	20/2,555	0.8
Total	437/61,120	0.7	583/29,454	2.0	294/44,012	0.7

Footnote: SHC check for genital warts on indication only. Positivity rate was estimated by dividing the number of genital warts diagnoses by the total number of registered consultations.

7.3 General practice

Figure 7.3 Estimated annual number of episodes of genital warts at GPs by gender and age group, based on extrapolation from GP practices in Nivel-PCD, 2013-2017



Footnote: About 70% of the total Dutch population consists of persons aged ≥ 25 years and about 30% consists of persons aged < 25 years.

Table 7.3 Annual reporting rate (number of episodes per 1,000 population) of genital warts at GPs in the Netherlands by gender and age group, based on GP practices in Nivel-PCD, 2013-2017

	Women n/1,000			Men n/1,000			Total n/1,000		
	All	<25	≥ 25	All	<25	≥ 25	All	<25	≥ 25
2013	1.9	2.4	1.7	2.5	1.7	2.9	2.2	2.1	2.3
2014	2.0	2.5	1.8	2.5	1.7	2.8	2.3	2.1	2.3
2015	1.9	2.2	1.8	2.5	1.6	2.9	2.2	1.9	2.3
2016	1.9	2.1	1.8	2.6	1.7	2.9	2.3	1.9	2.4
2017	2.0	2.2	2.0	2.9	1.8	3.3	2.5	2.0	2.7

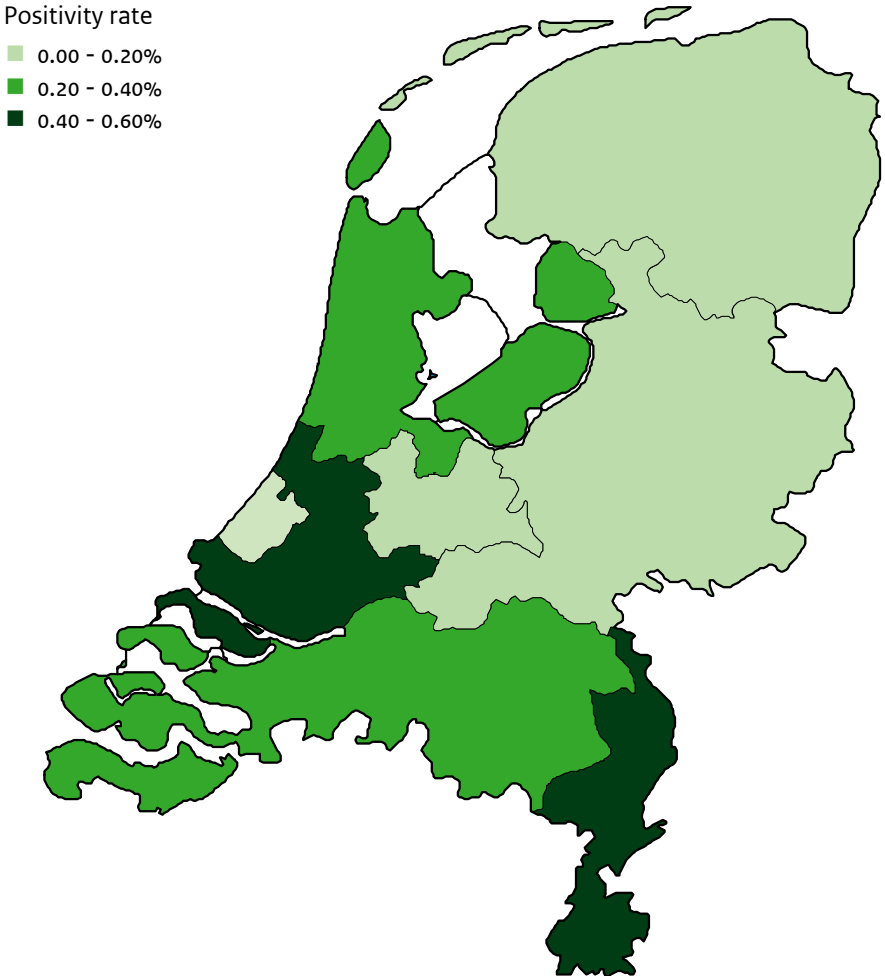
8 Genital herpes

8.1 Key points

- In 2018, the number of genital herpes diagnoses at the SHC was 426 among the registered consultations in the national database (42.3% in women, 27.2 % in heterosexual men and 30.5% in MSM).
- The positivity rate of genital herpes in 2018 was 0.3% for women and MSM and 0.4% for heterosexual men.
- Among heterosexual men and MSM, Herpes Simplex Virus 2 (HSV2) primary infection was more common than HSV1 primary infection. Among women, HSV1 primary infection was slightly more common.
- At GPs, the number of genital herpes episodes estimated from Nivel-PCD data was 25,800 in 2017, with a reporting rate of 1.5 per 1,000 population (1.3 per 1,000 population in 2016). The reporting rate was higher for women than for men (2.2 versus 0.8/1,000). Among men, the reporting rate was higher in the ≥ 25 age group (1.0/1,000) compared to the < 25 age group (0.3/1,000), whereas in women, rates were more or less similar across both age ranges.

8.2 Sexual Health Centres: characteristics, risk groups and trends

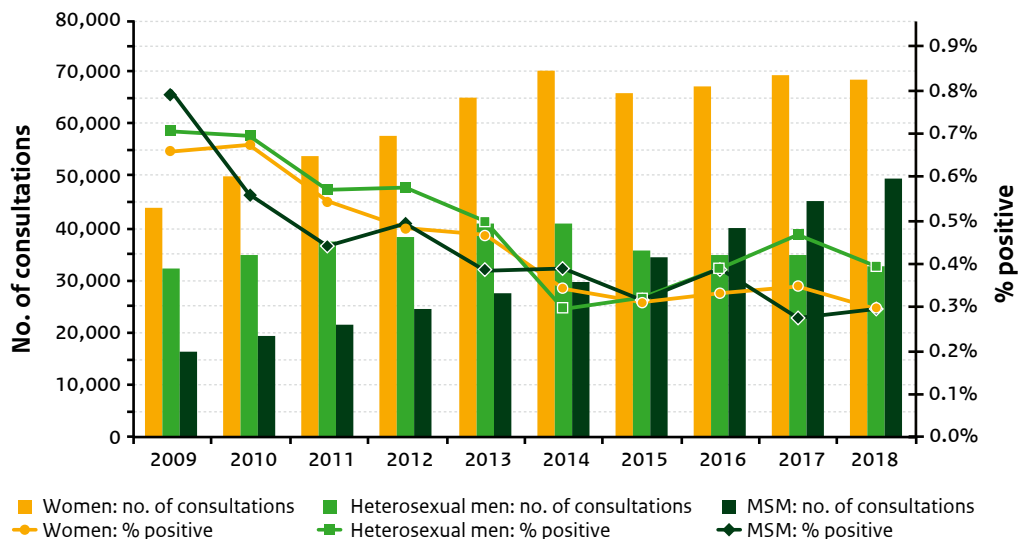
Figure 8.1 Positivity rates of genital herpes by region, the Netherlands, 2018



Footnote 1: SHC check for genital herpes on indication only. Positivity rate was estimated by dividing the number of genital herpes diagnoses by the total number of registered consultations.

Footnote 2: All genital herpes diagnoses at the SHC are included, both lab confirmed and not lab confirmed.

Figure 8.2 Total number of STI consultations and positivity rate of genital herpes by gender and type of sexual contact, 2009-2018



Footnote 1: SHC test for genital herpes on indication only. Number of consultations based on registered consultations and aggregated data of non-registered consultations. Positivity rate was estimated by dividing the number of genital herpes diagnoses by the total number of registered consultations.

Footnote 2: All genital herpes diagnoses at the SHC are included, both lab confirmed and not lab confirmed.

Table 8.1 Number of people diagnosed with genital herpes and number of consultations by age, gender and type of sexual contact, 2018

Age (years)	Women		Heterosexual men		MSM	
	n positive/N	%	n positive/N	%	n positive/N	%
≤24	109/43,240	0.3	49/18,200	0.3	22/7,081	0.3
≥ 25	71/17,880	0.4	67/11,254	0.6	108/36,929	0.3
Total	180/61,120	0.3	116/29,454	0.4	130/44,012	0.3

Footnote 1: SHC test for genital herpes on indication only. Positivity rate was estimated by dividing the number of genital herpes diagnoses by the total number of registered consultations.

Footnote 2: All genital herpes diagnoses at the SHC are included, both lab confirmed and not lab confirmed.

Table 8.2 Number of people diagnosed with genital herpes and number of consultations by migration background, gender and type of sexual contact, 2018

Migration background	Women		Heterosexual men		MSM	
	n positive/N	%	n positive/N	%	n positive/N	%
Ethnic Dutch	114/44,110	0.3	65/18,414	0.4	85/29,662	0.3
Western migrants	17/6,867	0.2	8/2,722	0.3	18/6,652	0.3
First generation non-Western migrants	16/3,670	0.4	18/3,074	0.6	18/5,111	0.4
Second generation non-Western migrants	33/6,425	0.5	25/5,219	0.5	8/2,555	0.3
Total	180/61,120	0.3	116/29,454	0.4	130/44,012	0.3

Footnote 1: SHC test for genital herpes on indication only. Positivity rate was estimated by dividing the number of genital herpes diagnoses by the total number of registered consultations.

Footnote 2: All genital herpes diagnoses at the SHC are included, both lab confirmed and not lab confirmed.

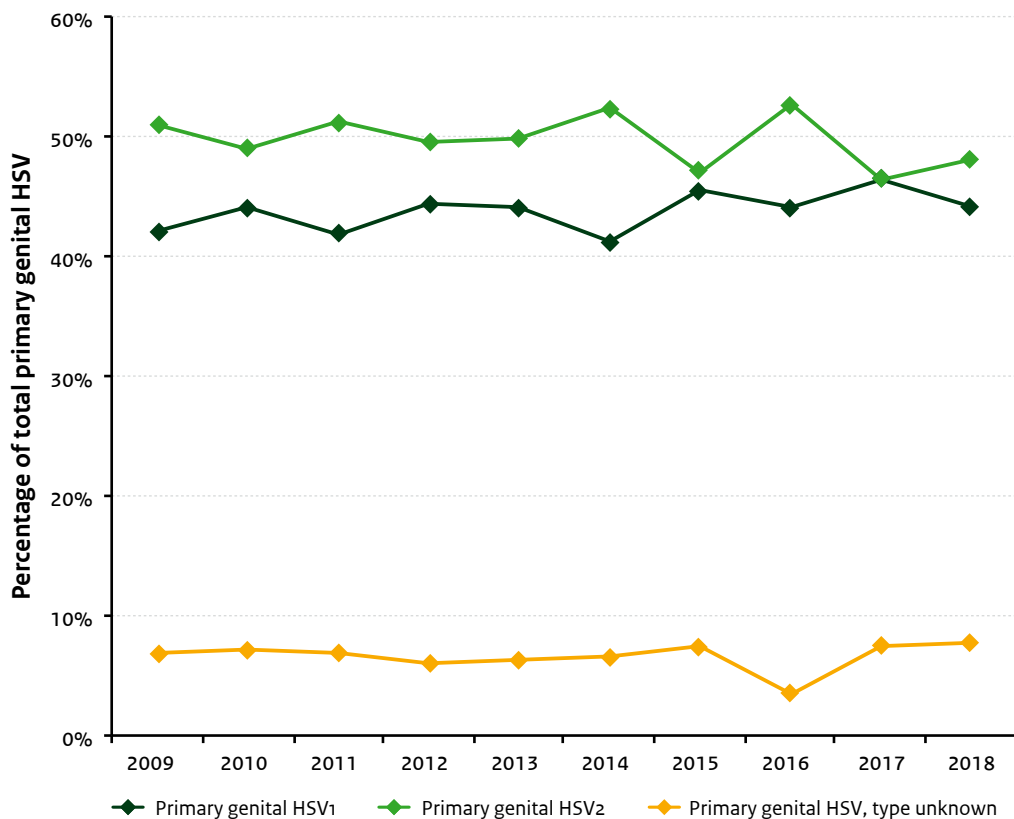
Table 8.3 Number and percentage of genital herpes types by gender and type of sexual contact, 2018

	Women		Heterosexual men		MSM	
	N	%	N	%	N	%
Primary HSV1	79	43.9	48	41.4	53	40.8
Primary HSV2	72	40.0	57	49.1	68	52.3
Primary HSV, type unknown*	21	11.7	8	6.9	3	2.3
Recurrent HSV	8	4.4	3	2.6	6	4.6
Total HSV	180		116		130	

* HSV type is unknown in the absence of a herpes test, or in case of a negative herpes test but with clinical symptoms strongly suggestive of herpes.

Footnote: People can be diagnosed with both HSV1 and HSV2.

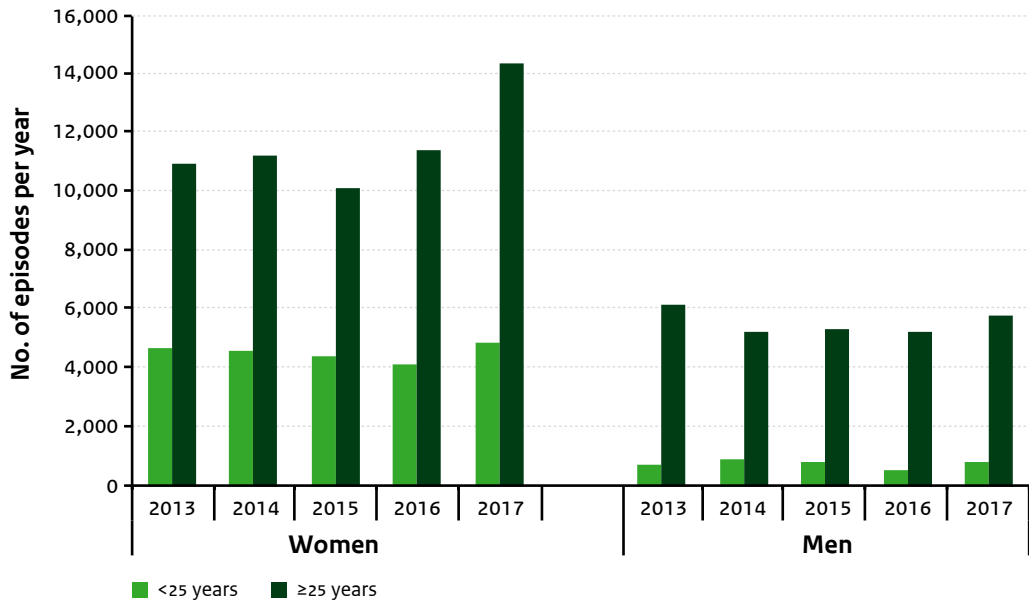
Figure 8.3 Percentage of HSV1, HSV2 and HSV type unknown of all primary genital herpes diagnoses, 2009-2018



Footnote: HSV type is unknown in the absence of a herpes test, or in case of a negative herpes test but with clinical symptoms strongly suggestive of herpes.

8.3 General practice

Figure 8.4 Estimated annual number of episodes of genital herpes at GPs by gender and age group, based on extrapolation from GP practices in Nivel-PCD, 2013-2017



Footnote: About 70% of the total Dutch population consists of persons aged ≥25 years and about 30% consists of persons aged <25 years.

Table 8.4 Annual reporting rate (number of episodes per 1,000 population) of genital herpes at GPs in the Netherlands by gender and age group, based on GP practices in Nivel-PCD, 2013-2017

	Women n/1,000			Men n/1,000			Total n/1,000		
	All	<25	≥25	All	<25	≥25	All	<25	≥25
2013	1.9	2.0	1.8	0.8	0.3	1.1	1.4	1.1	1.4
2014	1.9	1.9	1.8	0.7	0.4	0.9	1.3	1.1	1.4
2015	1.7	1.8	1.7	0.7	0.3	0.9	1.2	1.1	1.3
2016	1.8	1.8	1.9	0.8	0.2	1.1	1.3	1.0	1.5
2017	2.2	2.1	2.3	0.8	0.3	1.0	1.5	1.2	1.6

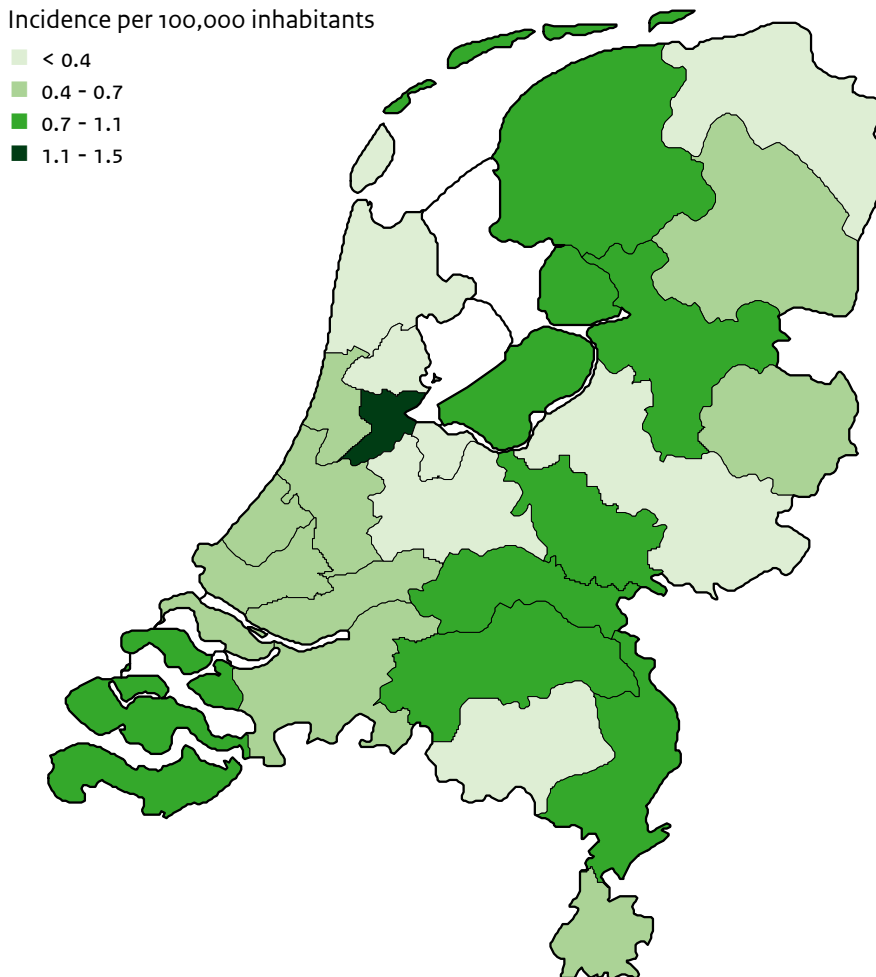
9 Hepatitis B

9.1 Key points

- In 2018, there were 101 notified cases of acute hepatitis B, fewer than in 2017 (115).
- The incidence of acute hepatitis B in 2018 was 0.6 per 100,000 inhabitants, and was higher in men (0.9 per 100,000) than in women (0.3 per 100,000).
- Among the notified cases, sexual contact remained the most common transmission route for acute hepatitis B (59.4%).
- At the SHC, 74 cases of infectious hepatitis B (both acute and chronic) were diagnosed in 2018 among the registered consultations in the national database, a decline from 2017 (93 cases).
- At the SHC, 54% of cases in 2018 were heterosexual men, 42% MSM and 30% women. Most of these (66.2%) were first-generation non-western migrants.
- In 2018, 4,248 MSM and 910 sex workers entered the hepatitis B vaccination programme for risk groups. Cumulatively, 62,923 MSM and 23,010 sex workers have entered the vaccination programme since its launch in 2002.

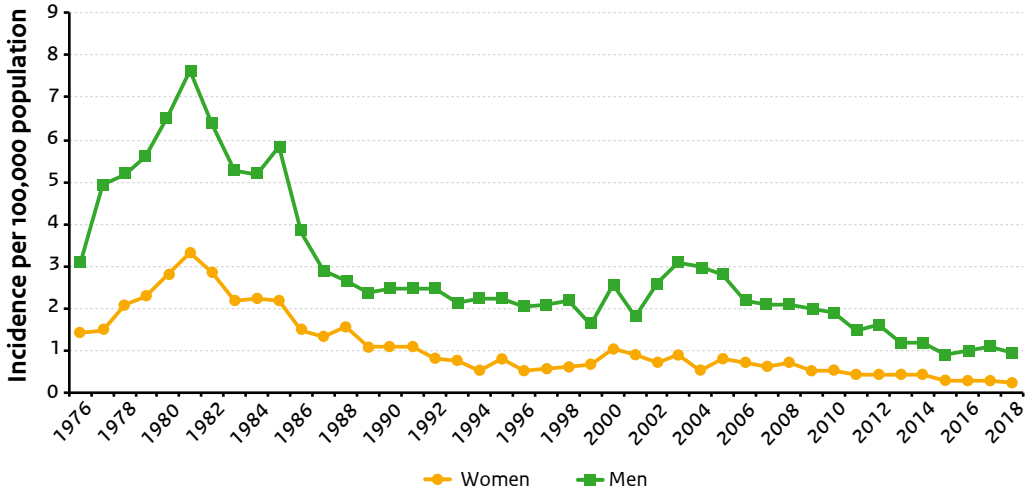
9.2 Notification data: characteristics, risk groups and trends

Figure 9.1 Incidence of acute hepatitis B per 100,000 inhabitants by region, the Netherlands, 2018



Source: RIVM-OSIRIS, notification data

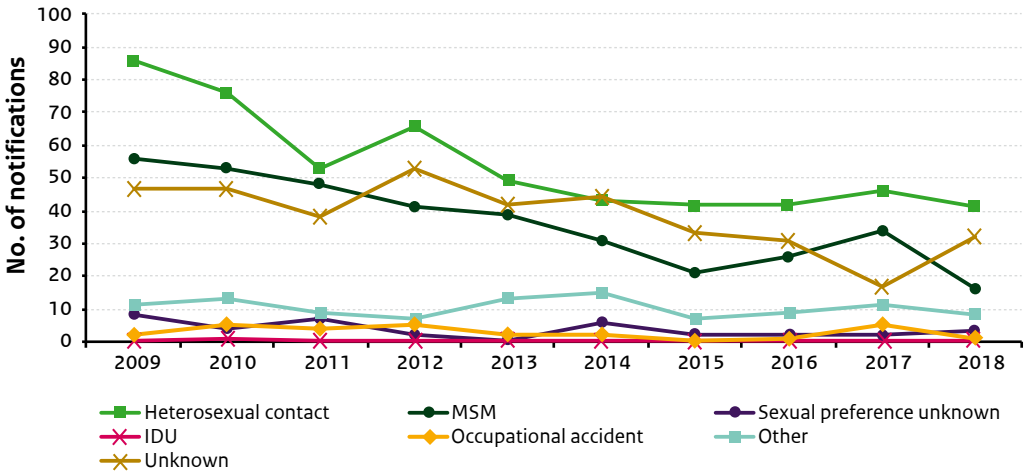
Figure 9.2 Incidence of acute hepatitis B by gender, 1976-2018



Source: RIVM-OSIRIS, notification data

Footnote: Data of 2018 might be incomplete, because of reporting delay (data were collected on 11 March 2019)

Figure 9.3 Number of acute hepatitis B infections by route of transmission, 2009-2018



Source: RIVM-OSIRIS, notification data

Footnote: Data of 2018 might be incomplete, because of reporting delay (data were collected on 11 March 2019)

Table 9.1 Proportion of acute hepatitis B cases by most common route of transmission, the Netherlands, 2018

	Heterosexual contact (N=44) n (%)*	MSM (N=16) n (%)*	Other (N=41) n (%)*
Infected abroad	6 (13.6)	2 (12.5)	8 (19.5)
Born abroad	10 (22.7)	3 (18.8)	11 (26.8)
Infected by casual partner	31 (70.5)	13 (81.3)	0 (0.0)
Median age (range)	39.5 (20-60)	49 (20-74)	48 (18-78)

Source: RIVM-OSIRIS, notification data

* Percentages do not add up to 100%, as proportions per category can overlap.

Footnote: Data of 2018 might be incomplete, because of reporting delay (data were collected on 11 March 2019)

9.3 Infectious hepatitis B diagnoses at the Sexual Health Centres

Table 9.2 Number of positive tests and persons tested for hepatitis B by age, gender and type of sexual contact, 2018

Age (years)	Women		Heterosexual men		MSM	
	n positive/N	%	n positive/N	%	n positive/N	%
≤19	2/659	0.3	1/219	0.5	1/511	0.2
20-24	1/2,620	0.0	8/1,596	0.5	3/2,057	0.1
25-29	3/1,641	0.2	5/1,216	0.4	4/2,137	0.2
30-34	3/733	0.4	9/623	1.4	4/1,427	0.3
35-39	6/397	1.5	3/327	0.9	5/838	0.6
40-44	3/280	1.1	1/165	0.6	3/607	0.5
45-49	2/211	0.9	1/133	0.8	3/572	0.5
50-54	1/128	0.8	0/95	0.0	0/529	0.0
≥ 55	1/93	1.1	0/107	0.0	1/691	0.1
Total	22/6,762	0.3	28/4,481	0.6	24/9,369	0.3

Footnote: Hepatitis B includes both acute and chronic cases.

Table 9.3 Number of positive tests and persons tested for hepatitis B by migration background, gender and type of sexual contact, 2018

Migration background	Women		Heterosexual men		MSM	
	n positive/N	%	n positive/N	%	n positive/N	%
Ethnic Dutch	1/2,558	0.0	0/1,264	0.0	3/5,348	0.1
Western migrants	8/1,503	0.5	2/547	0.4	7/1,968	0.4
First generation non-Western migrants	12/1,919	0.6	25/2,015	1.2	12/1,380	0.9
Second generation non-Western migrants	1/757	0.1	1/639	0.2	1/660	0.2
Non-Western, unknown generation	0/25	0.0	0/16	0.0	1/14	7.1
Total	22/6,762	0.3	28/4,481	0.6	24/9,370	0.3

Footnote: Hepatitis B includes both acute and chronic cases.

Table 9.4 Concurrent STI by gender and type of sexual contact among persons diagnosed with hepatitis B, 2018

Concurrent infection	Women	Heterosexual men	MSM
	(N=22) n (%)	(N=28) n (%)	(N=24) n (%)
Chlamydia	0 (0.0)	7 (25.0)	3 (12.5)
Gonorrhoea	0 (0.0)	1 (3.6)	2 (8.3)
Syphilis, infectious	0 (0.0)	0 (0.0)	3 (12.5)
HIV newly diagnosed	0 (0.0)	0 (0.0)	5 (20.8)
Genital herpes	0 (0.0)	0 (0.0)	0 (0.0)
Genital warts	0 (0.0)	0 (0.0)	2 (8.3)
Hepatitis C	0 (0.0)	0 (0.0)	0 (0.0)

Footnote 1: Hepatitis B includes both acute and chronic cases.

Footnote 2: SHC check for genital herpes and genital warts on indication only. In addition, clients are not routinely tested on hepatitis C.

9.4 Antenatal screening

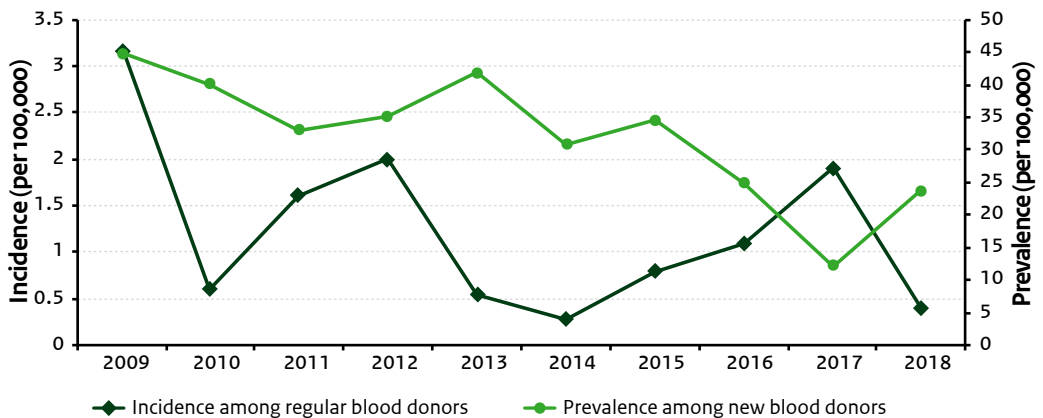
Table 9.5 Hepatitis B prevalence estimates in pregnant women, based on test results of antenatal screening, 2013-2017

Period	No. of women screened	Confirmed positive test results	Prevalence estimate
2013	176,086	529	0.30
2014	174,646	559	0.32
2015	176,238	506	0.29
2016	172,799	507	0.29
2017	170,461	480	0.28

Sources: C.P.B. van der Ploeg (TNO), P. Oomen (RIVM), K. Vos (RIMV). Prenatale Screening Infectieziekten en Erytrocytenimmunisatie (PSIE). Procesmonitor 2017. TNO/RIVM 2019; and earlier monitors.

9.5 Blood donors

Figure 9.4 Hepatitis B incidence and prevalence (per 100,000) among regular and new blood donors in the Netherlands, 2009-2018



Source: Sanquin

9.6 Hepatitis B vaccination programme for risk groups

Figure 9.5 Number of persons entering the hepatitis B vaccination programme, 2002-2018

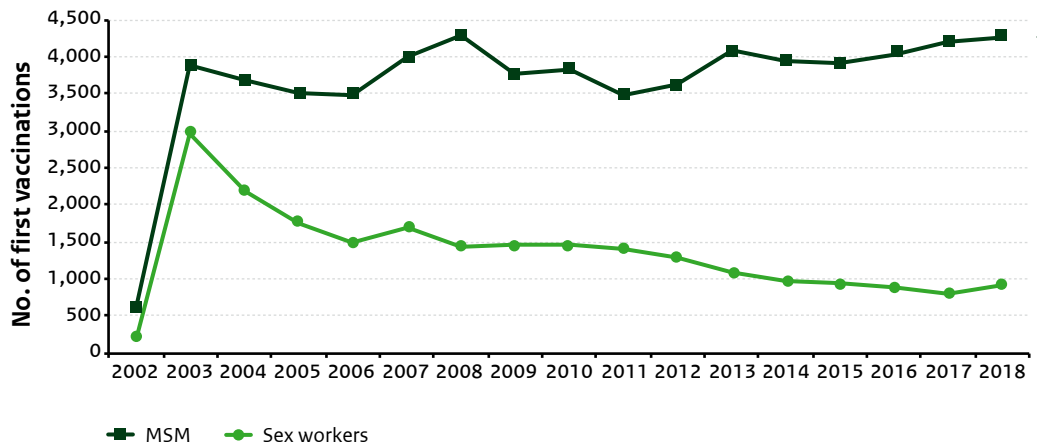


Table 9.6 Number of first, second and third time vaccinated participants of the hepatitis B vaccination programme, 2002-2018

	Sex workers	MSM
First vaccination	23,010	62,923
Second vaccination	14,993	49,683
Third vaccination	10,563	41,829

Figure 9.6 Percentage of hepatitis B chronically infected and immune participants of the hepatitis B vaccination programme, 2009-2018

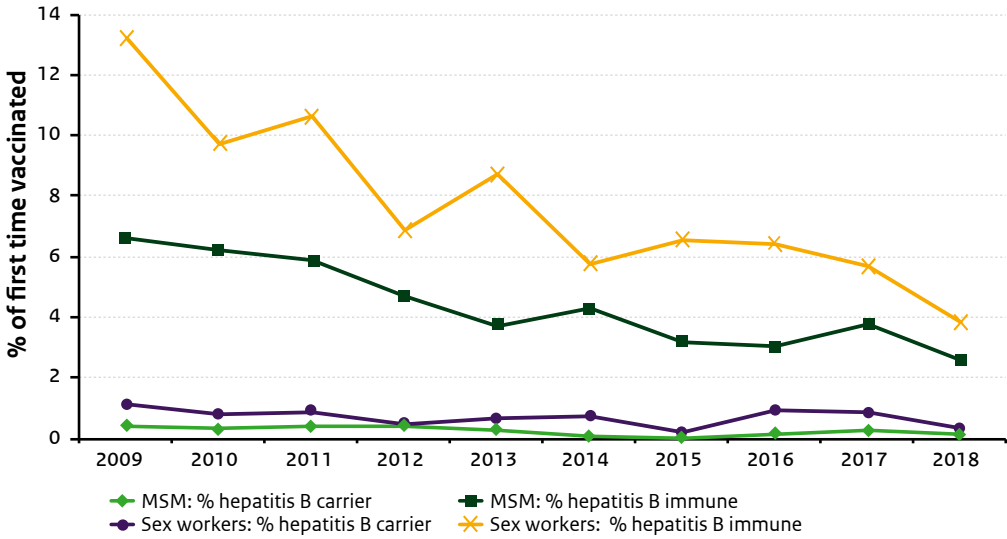
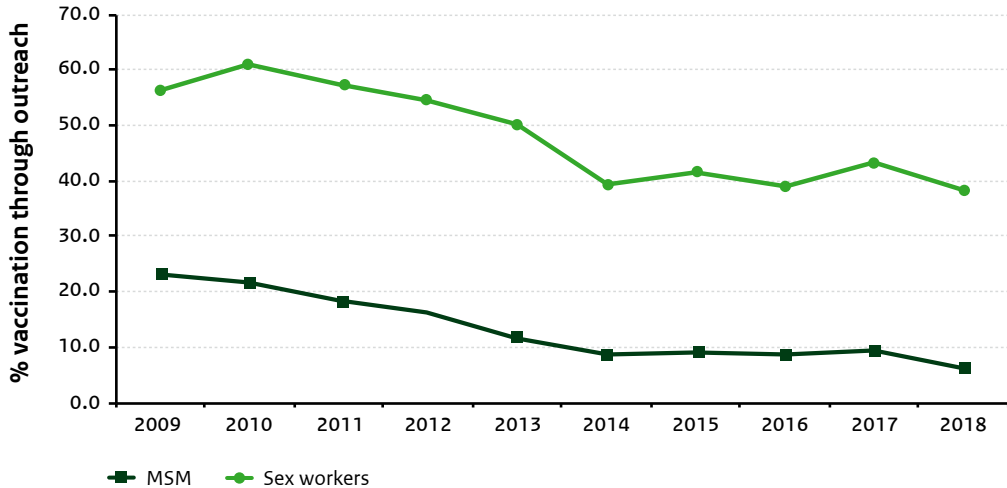


Figure 9.7 Percentage of first hepatitis B vaccinations given at outreach locations* by risk group, 2009-2018



* Outreach locations include penitentiary institutes, MSM locations, drug locations or sex worker locations. Non-outreach locations are SHC and PHS locations.

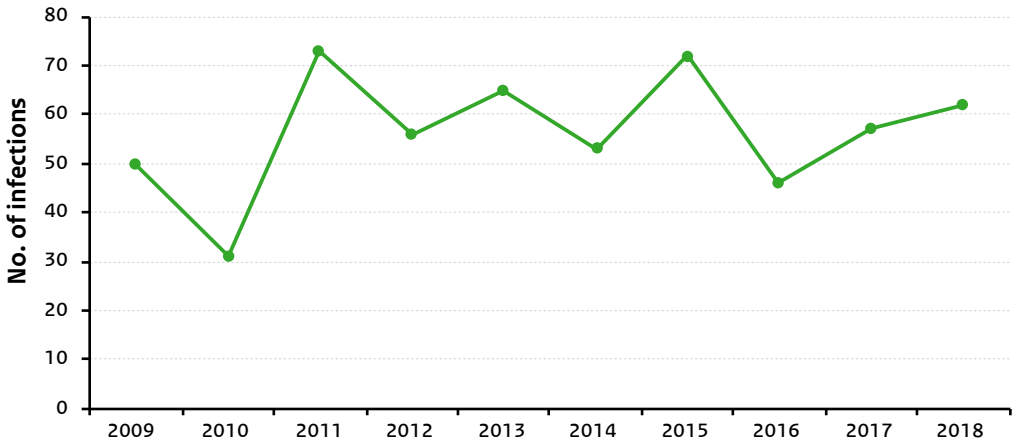
10 Hepatitis C

10.1 Key points

- In 2018, the total number of acute hepatitis C infections (62) was similar to that in 2017 (57).
- Unprotected sexual contact between men remained the most commonly reported transmission route for acute hepatitis C (61%).
- Of all notified hepatitis C infections in MSM in 2018 (38), 30 were HIV-positive (79%).
- At the SHC, 4,039 persons were tested for hepatitis C among the registered consultations in the national database, of whom 3,965 were MSM. 38 hepatitis C infections were diagnosed; 37 in MSM and 1 in a woman.

10.2 Notification data: characteristics, risk groups and trends

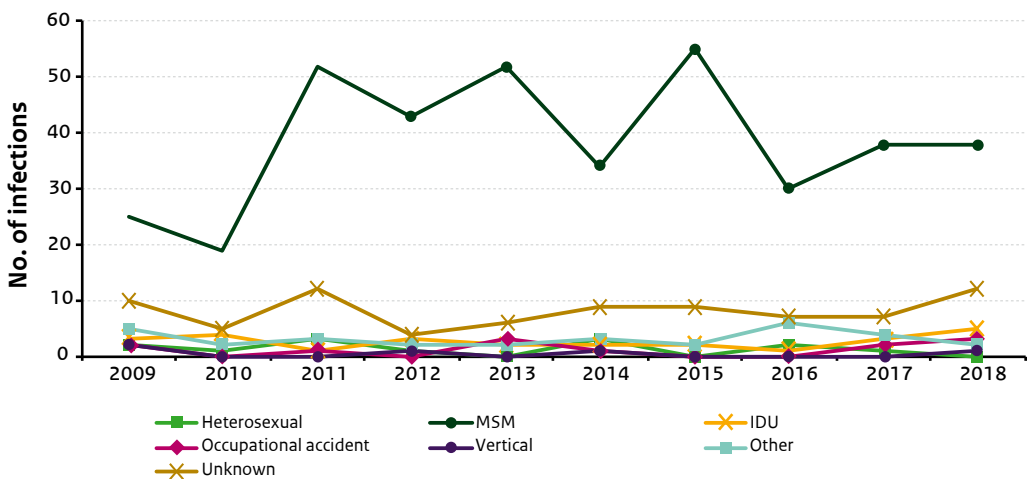
Figure 10.1 Number of acute hepatitis C infections, 2009-2018



Source: RIVM-OSIRIS, notification data

Footnote: Data of 2018 might be incomplete, because of reporting delay (data were collected on 20 March 2019).

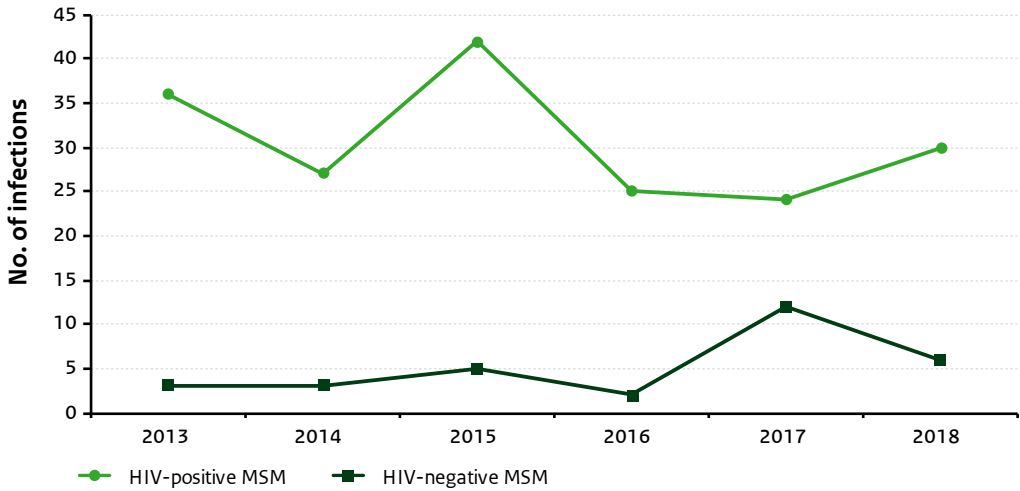
Figure 10.2 Number of acute hepatitis C infections by route of transmission, 2009-2018



Source: RIVM-OSIRIS, notification data

Footnote: Data of 2018 might be incomplete, because of reporting delay (data were collected on 20 March 2019).

Figure 10.3 Number of acute hepatitis C infections in MSM by HIV status, 2013-2018

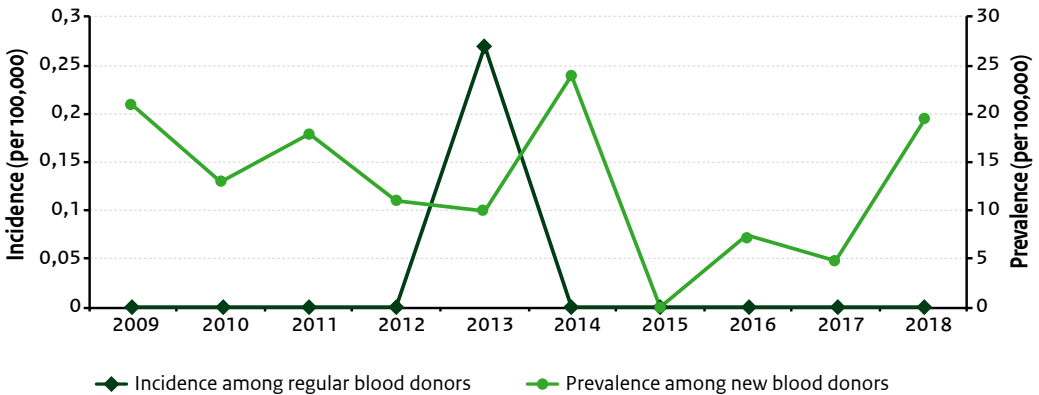


Source: RIVM-OSIRIS, notification data

Footnote: Data of 2018 might be incomplete, because of reporting delay (data were collected on 20 March 2019).

10.3 Blood donors

Figure 10.4 Hepatitis C incidence and prevalence among regular and new blood donors in the Netherlands, 2009-2018



Source: Sanquin

11 Conclusions and recommendations

Both the total number of consultations (152,217) and the percentage of people with a positive STI test at SHC (18.2%) remained fairly stable in 2018 compared to 2017 (150,593 and 18.4% respectively). The number of consultations among MSM increased, whereas it decreased among women and heterosexual men. Following the implementation of the GDPR in May 2018, 11% of the clients did not consent to share data with the RIVM for national surveillance purposes. Aggregated anonymous data (numbers of STI tests and diagnoses by gender and sexual contact) were obtained for non-consenting clients to avoid breaks in the overall STI trends. Numbers and trends by risk factors were based on registered consultations only (135,029 consultations). The representativeness of consenting clients is unknown, therefore these missing consultations might affect the interpretability of results based on consenting clients only. However, excluding aggregated data did not lead to a change in overall STI trends.

The total number of STI-related episodes recorded at GPs is twice that reported at SHC, with an estimated 307,400 episodes in 2017, an increase compared to 2016 (281,300 episodes). This increase was observed mainly among women and people aged 25 and older. Unfortunately, there are no data sources available for an estimation on the number of tests purchased online with corresponding numbers of STI diagnoses. Data from the Health Survey showed that in 2017, 13% of women aged 16-29, 9% of heterosexual men aged 16-29, and 22% of MSM aged 16-44 reported STI testing in the past year¹⁶. These figures are comparable to previous years. Repeated national prevalence surveys are needed to analyse trends in STI prevalence, to place current surveillance of STIs (general practice, hospitals and laboratories) in perspective and to evaluate control policies¹⁷.

Consultation rates and STI positivity rates differed strongly between the PHS regions in the Netherlands, which can (at least partially) be explained by differences in SHC attendee characteristics including education level, age, and the percentage of attendees who were notified or had STI symptoms. Groups that were at high risk of STI, as reflected in their high positivity rates, were those who reported being notified for an STI, having STI related symptoms, or people who were previously or newly diagnosed with HIV. Risk behaviours among MSM corresponding with high STI positivity rates were group sex, sex with HIV-positive partners and drug use in relation to sex. The use of PrEP was reported by 4% of MSM, among whom 73% obtained PrEP from a Dutch health care provider. The STI positivity rate was 29% in MSM

¹⁶ Health Survey/Lifestyle Monitor, Statistics Netherlands (CBS) in collaboration with National Institute for Public Health and the Environment (RIVM), Rutgers and Soa Aids Nederland, 2017.

¹⁷ Heijne JCM, van Aar F, Meijer S, de Graaf H, van Benthem BHB. Placing sexually transmitted infections surveillance data in perspective by using national probability sample surveys. Submitted for publication.

reporting PrEP use compared to 18% in MSM who did not report PrEP use. Surveillance of PrEP use and its effects on the occurrence of HIV, STI and changes in sexual behaviour is important and will be implemented in the SHC from July 2019 onwards.

Only 25% of MSM reported consistent condom use during anal sex. Among women and heterosexual men, consistent condom use during vaginal sex was even lower (7%). While this indicates that those at highest risk do find the SHC, it also indicates that high-risk behaviour is ongoing. Low risk perception in combination with high-risk behaviour plays an important role in the acquisition of STI¹⁸. Sexual risk behaviours combined with psychological factors are defining factors in STI risk and tailoring preventive messages to these factors during STI consultations is encouraged^{18,19}. Further efforts, such as promotion of condom use, repeated testing and more effective (timely and complete) partner notification are needed to ensure that people in high-risk groups effectively improve their sexual health and that of their partners. At the same time, testing and treatment strategies need to be optimised to maximise the effect of control efforts and to reach those most in need of care.

Chlamydia remains the most commonly diagnosed bacterial STI, both at the SHC and at GPs. In SHC, the positivity rate of chlamydia increased until 2016 but remained stable in women, MSM, and heterosexual men in 2018 compared to 2017. This increase in the earlier years could be explained by stricter prioritizing clients based on risk behaviour. At GPs, the estimated number of chlamydia episodes increased compared to the previous years. Surveillance of chlamydia at GPs is hampered by the lack of a specific ICPC main code for chlamydia. As chlamydia rates did not change, one should consider focusing on disease management (i.e. prevention of long-term complications of chlamydia) instead of finding all chlamydia infections by extensive testing²⁰. Surveillance of long-term complications is needed, including the identification of those with the highest risk of complications based on, amongst others, genetic markers. In the Netherlands Chlamydia Cohort Study (NECCST), it was estimated that women with a chlamydia history had a higher risk of pelvic inflammatory disease and tubal factor infertility²¹. Lymphogranuloma venereum (LGV, the L2 strain of chlamydia leading to serious symptoms and complications) among MSM remains uncommon, but the number of cases increased again at SHC in 2018, whereas the positivity rate remained stable compared

¹⁸ van Wees DA, den Daas C, Kretzschmar MEE, Heijne JCM. Double trouble: modelling the impact of low risk perception and high-risk sexual behaviour on chlamydia transmission. *J R Soc Interface*. 2018 Apr;15(141). pii: 20170847. doi: 10.1098/rsif.2017.0847.

¹⁹ Slurink IAL, van Benthem BHB, van Rooijen MS, Achterbergh RCA, van Aar F. Latent classes of sexual risk and corresponding STI and HIV positivity among MSM attending centres for sexual health in the Netherlands. Submitted for publication.

²⁰ Heijne JCM, van den Broek IVF, Bruisten SM, van Bergen JEA, de Graaf H, van Benthem BHB. National prevalence estimates of chlamydia and gonorrhoea in the Netherlands. *Sex Transm Infect*. 2019 Feb;95(1):53-59. doi: 10.1136/sextrans-2017-053478. Epub 2018 Jun 20.

²¹ Hoenderboom BM, van Benthem BHB, van Bergen JEAM, Dukers-Muijers NHTM, Götz HM, Hoebe CJP, Hogewoning AA, Land JA, van der Sande MAB, Morré SA, van den Broek IVF. Relation between *Chlamydia trachomatis* infection and pelvic inflammatory disease, ectopic pregnancy and tubal factor infertility in a Dutch cohort of women previously tested for chlamydia in a chlamydia screening trial. *Sex Transm Infect*. 2019 Jan 3. pii: sextrans-2018-053778. doi: 10.1136/sextrans-2018-053778

to 2017. Half of all LGV cases were among HIV-negative MSM. This is an increase compared to earlier years. In addition, the proportion of LGV cases without STI symptoms has increased over time. These results confirm the importance of testing all MSM for rectal chlamydia and all positives for LGV, regardless of HIV status or symptoms. Rectal chlamydia infections in MSM are also an indication for LGV testing at GPs. However, the percentage of anal testing in GPs is very low, consequently LGV infections may be missed.

Infections with gonorrhoea mainly occur in MSM. At SHC, the positivity rate remained stable in MSM in 2018 compared to the two previous years, and was higher than the positivity rate for chlamydia among MSM. The incidence rate of gonorrhoea among men and women in GP surveillance increased again compared to previous years, mainly among women aged 25 and older. Close surveillance of gonorrhoea trends is of particular importance, as treatment failures with the only available treatment option (third-generation cephalosporins) have been reported in European patients. So far, resistance to ceftriaxone, a third-generation cephalosporin that has been the first-choice medication in the Netherlands since 2006, has not been found at SHC in the Netherlands. Of concern is the increasing resistance to azithromycin, to 11% in 2018, based on GRAS surveillance data and using the new EUCAST 2019 breakpoints²². The increasing trend is visible nationwide but differs between regions. Laboratory research is ongoing concerning these regional differences.

For syphilis, the number of diagnoses has stabilised and positivity rates have slightly decreased since 2017, mainly due to a decreasing rate among HIV-positive men. This finding may be explained by enhanced partner notification, increased repeat testing, and/or decreased exposure in HIV-positive men, both of which may have led to earlier diagnosis and treatment of syphilis and consequently, to decreased transmission. Low rates of syphilis infections among women are important considering the potentially devastating consequences of syphilis in pregnancy. A number of countries in and outside of Europe have reported recent increases in syphilis rates among women and in congenital syphilis cases. It is therefore important to carefully monitor these increases while at the same time ensuring that syphilis screening programmes are implemented effectively, as is the case in the Netherlands^{23,24}.

²² The European Committee on Antimicrobial Susceptibility Testing. Breakpoint tables for interpretation of MICs and zone diameters. Version 9.0, 2019. Available from http://www.eucast.org/clinical_breakpoints/

²³ European Centre for Disease Prevention and Control. Congenital syphilis. In: ECDC. Annual epidemiological report for 2017. Stockholm: ECDC; 2019.

²⁴ Visser M, van der Ploeg CPB, Smit C, Hukkelhoven CWPM, Abbink F, van Benthem BHB, Op de Coul ELM. Evaluating progress towards triple elimination of mother-to-child transmission of HIV, syphilis and hepatitis B in the Netherlands. *BMC Public Health*. 2019 Mar 29;19(1):353. doi: 10.1186/s12889-019-6668-6.

The HIV positivity rate at SHC has been declining for years. Two thirds of all new HIV diagnoses in the Netherlands occur among MSM. At SHC, the highest positivity rate was found among MSM who were notified for HIV. In addition, one in three MSM newly diagnosed with HIV were notified for STI exposure, which stresses the importance of partner notification in HIV control. Compared to MSM, heterosexuals are more often diagnosed late (CD4 < 350/mm³ or AIDS), especially heterosexual men (68% in 2018), and those diagnosed at GPs or in hospitals. Numbers of recently acquired HIV infections were also much lower among heterosexuals (5%) compared to MSM (28%). UNAIDS set the 90-90-90 goals (90% diagnosed, of whom 90% received antiretroviral therapy, of whom 90% have an undetectable viral load) by 2020. The Netherlands as a whole reached these 90-90-90 goals in 2017: 90% for the first goal, with 93% of patients who are retained in care on antiretroviral therapy, of whom 95% had an undetectable load. However, there were regional differences in achieving these goals. To increase the percentage of diagnosed HIV positives and to prevent new HIV infections, a multi-sectorial approach is needed, including innovative biomedical interventions such as PrEP (a national programme will be implemented in 2019) and interventions to increase HIV testing uptake. These may include (peer-led) community-based testing, pro-active testing by GPs, partner notification and primary prevention by behavioural interventions focusing on increased condom use (and other risk reduction strategies). Stigma reduction for all STI, and especially HIV, is still necessary.

The number of acute hepatitis B notifications was similar to 2017, and sexual contact was the most reported transmission route. In contrast, the number of acute hepatitis C notifications has fluctuated in recent years. In 2019, chronic hepatitis C infections became notifiable again. Similar to HIV, the WHO goals for HBV and HCV state that by 2030, 90% of all HBV- and HCV-infected people should be diagnosed, 90% of those eligible being treated, of whom 90% should have undetectable viral load. Currently, there are no estimations available to present the continuum of care for hepatitis B and C in the Netherlands. For that, SHM is piloting the registration of hepatitis C infections in several hospitals.

National real-time data from SHC, in addition to local alerts, can provide early warning of outbreaks of STI in certain high-risk groups or regions. In 2017, five local alerts were reported in the weekly infectious disease signal report: two on hepatitis A infections among MSM, one on a hepatitis B cluster among MSM, one on LGV infections among MSM and one on LGV in a heterosexual couple.

Online testing using home testing kits (direct result) or home sampling kits (tested at laboratories) is gaining popularity, and it is important to coordinate efforts to reach the groups making use of this form of testing and provide them with tailored information on sexual health, STI prevention and control, and information on reliable online tests. Incorporating online test use and online test results in STI surveillance via test providers or laboratory surveillance is challenging but necessary, since a substantial number of people use these online services.

In 2017, the national Action Plan on STIs, HIV, and Sexual Health for 2017-2022 was developed in cooperation with stakeholders working in the field of sexual health and accepted by the Ministry of Health, Welfare and Sport. The action plan presents an integrated approach that enables Dutch residents to make sensible choices about matters of sexual health, and it provides access to care if problems relating to their sexual health arise, including STIs and HIV. Surveillance of STIs, HIV and sexual health plus monitoring of the effects of interventions are essential for providing an evidence-based foundation for prevention, the measures taken and for policy-making. The goals for STIs and HIV focus on reducing the burden of disease from chlamydia, halving the numbers of diagnoses of syphilis, gonorrhoea and HIV (compared to 2016), and reducing the number of acute HBV and HCV infections to zero. The goal for HIV is that by 2022, 95% of people with HIV will know their HIV status, 95% of them will be receiving treatment, and 95% of them will have an undetectable viral load, with zero deaths in the Netherlands from AIDS. Based on the data presented in this annual report, these goals have not yet been reached. To be able to achieve these goals we provide the following recommendations:

- Maintain a strong, multi-sectoral basis for STI control to facilitate 1) easy access to care and testing, 2) rapid and reliable results, and 3) effective treatment and prevention.
- Maintain integrated surveillance of STIs and STI risks among high-risk groups as well as keeping track of the general population.
- Stimulate the systematic culturing of *Neisseria gonorrhoea* or innovative ways to measure resistance, to prevent the transmission of pan-drug resistant strains.
- Promote timely and complete partner notification, especially for gonorrhoea, syphilis, LGV and HIV, not only at SHC but also at GPs and HIV treatment centres.
- Stimulate the use of general practitioner guidelines for pro-active testing in high-risk groups on HIV and STI, and at the relevant anatomic locations.
- Support efforts to develop a national surveillance system for HBV and HCV to be able to estimate the burden of disease and to present the continuum of care for HBV and HCV.

APPENDICES

Appendix A List of abbreviations

ACS	Amsterdam Cohort Studies
AIDS	Acquired Immune Deficiency Syndrome
ATHENA	AIDS Therapy Evaluation in the Netherlands
AVG	Algemene Verordening Gegevensbescherming
CBS	Centraal Bureau voor de Statistiek, Statistics Netherlands
Cib	Centrum Infectieziektebestrijding, Centre for Infectious Disease Control
CSG	Centrum Seksuele Gezondheid
CvB	Centrum voor Bevolkingsonderzoek, Centre for Population Screening
EUCAST	European Committee on Antimicrobial Susceptibility Testing
ECDC	European Centre for Disease Prevention and Control
GDPR	General Data Protection Regulation
GP	General Practitioner
GRAS	Gonococcal Resistance to Antimicrobials Surveillance programme
HBV	Hepatitis B Virus
HCV	Hepatitis C Virus
HIV	Human Immunodeficiency Virus
HSV	Herpes Simplex Virus
ICPC	International Classification of Primary Care
IgM	Immunoglobulin M
IDS	Centrum Infectieziekteonderzoek, Diagnostiek en Laboratorium Surveillance, Centre for Infectious Diseases Research, Diagnostics and Laboratory Surveillance
LCI	Landelijke Coördinatie Infectieziektebestrijding, National Coordination Centre for Communicable Disease Control
LGV	<i>Lymphogranuloma venereum</i>
LSM	Leefstijl Monitor, Lifestyle Monitor
MIC	Minimum Inhibitory Concentration
MSM	Men who have Sex with Men
Nivel	Nederlands Instituut voor onderzoek van de Gezondheidszorg, Netherlands Institute for Health Services Research
Nivel-PCD	Nivel Primary Care Database
PHS	Public Health Service
PID	Pelvic Inflammatory Disease
PrEP	Pre-exposure prophylaxis
RIVM	Rijksinstituut voor Volksgezondheid en Milieu, National Institute for Public Health and the Environment
SANL	Soa Aids Nederland
SHC	Sexual Health Centre
SHM	Stichting HIV Monitoring, HIV Monitoring Foundation
SOA	Seksueel Overdraagbare Aandoeningen
SOAP	Online STI registration system
STI	Sexually Transmitted Infection

TNO	Nederlandse Organisatie voor toegepast-natuurwetenschappelijk onderzoek
UNAIDS	Joint United Nations Programme on HIV/AIDS
VPZ	Centrum Voeding, Preventie en Zorg, Centre for Nutrition, Prevention and Health Services
WHO	World Health Organisation

Appendix B STI case-definitions of Sexual Health Centres

Chlamydia trachomatis

Chlamydia diagnosis is based on positive nucleic acid amplification test (NAAT) on genital (vagina/urine) material or on indication extragenital (anus, oropharynx) material collected either by a professional or self-collected by patients. Chlamydia diagnosis in a person is defined by a combination of genital and extragenital testing.

Lymphogranuloma venereum

LGV is diagnosed based on a positive PCR for *Chlamydia trachomatis* species, followed by genotyping assessing Ct serotype L1, L2 or L3.

Gonorrhoea

Gonorrhoea diagnosis is based on positive nucleic acid amplification test (NAAT) on genital (vagina/urine) material or on indication extragenital (anus, oropharynx) material collected either by a professional or self-collected by patients. Gonorrhoea diagnosis in a person is defined by a combination of genital and extragenital testing.

Syphilis

Syphilis diagnosis is based on a serological screening by Treponemal tests (Treponemal tests: TPHA/TPPA or EIA) followed by IgG or IgM-westernblot. Activity of the infection is assessed by non treponemal tests like RPR/VDRL. NAAT is indicated in primary infection.

The stage of syphilis is defined by clinicians according to symptoms: Lues stage I, II, latens recens (infection acquired in the last 12 months). These three stages are defined as infectious syphilis. Lues stage unknown or lues latens tarda are non-infectious diagnoses.

HIV

HIV is diagnosed based on a positive 4th generation HIV combotest (anti-HIV and p24 Antigen), followed by an immunoblot on the same sample to confirm presence of antibodies and to distinguish between HIV-1 and HIV-2. On indication, HIV PCR is performed to confirm an infection.

Genital warts

Genital warts is a clinical diagnosis based on symptoms.

Genital herpes

Genital herpes diagnostic is primarily based on clinical symptoms, and confirmed by herpes NAAT from lesions to confirm the diagnosis and differentiate Herpes Simplex Virus 1 (HSV1) and HSV2.

Hepatitis B

Hepatitis B screening is performed by detection of Anti-HBcore antibodies. In case of positive screening-test, HBs-antigen is tested to diagnose infectious hepatitis B.

Hepatitis C

Hepatitis C is diagnosed based on several steps of a combination of serological and molecular methods, depending on possible/suspected time-point of exposure. If exposure is more than 3 months before consultation, diagnosis is based on an anti-HCV-test, and confirmed with HCV-immunoblot or HCV-RNA. If exposure is less than 3 months before consultation or when the patient immunity is suppressed, diagnosis is based on HCV-RNA

Appendix C National surveillance of Sexual Health Centres

Coordinating SHC

GGD Amsterdam	A.A. Hogewoning
GGD Haaglanden	M. Keizer
GGD Groningen	F. de Groot
GGD Hart voor Brabant	S. Van Bergen
GGD Gelderland-Zuid	M. Hoff
GGD Rotterdam-Rijnmond	K. Ridder
	A. Wielemaker
GGD Regio Utrecht	B. Boogmans
	V. Sigurdsson
GGD Zuid Limburg	C.J.P.A. Hoebe
	M. Steenbakkers

Regional SHC

GGD Brabant-Zuidoost
GGD Drenthe
GGD Flevoland
GGD Fryslân
GGD Noord- en Oost-Gelderland
GGD Gelderland-Midden
GGD Hollands-Midden
GGD Hollands Noorden
GGD Kennemerland
GGD Twente
GGD West-Brabant
GGD IJsselland
GGD Zaanstreek-Waterland
GGD Zeeland
GGD Zuid-Holland Zuid
GGD Zuid Limburg
Veiligheidsregio Limburg Noord

Laboratories

Maastricht Universitair Medisch Centrum (MUMC)
Albert Schweitzer Ziekenhuis Dordrecht
Amphia Ziekenhuis Breda
Centraal Bacteriologisch en Serologisch laboratorium Hilversum
CERTe Medische Diagnostiek & Advies Groningen
Deventer ziekenhuis
Diagnostiek voor U Eindhoven
Erasmus MC Rotterdam
Gelre Ziekenhuizen Apeldoorn
Groene Hart Ziekenhuis Gouda
Haaglanden Medisch Centrum
Isala klinieken Zwolle
Izore, Centrum Infectieziekten Friesland
Jeroen Bosch Ziekenhuis 's-Hertogenbosch
Laboratoria Pathologische Anatomie en Medische Microbiologie Veldhoven
Laboratorium Microbiologie Twente Achterhoek
Laboratorium voor Infectieziekten Groningen
Laboratorium voor medische microbiologie & immunologie Admiraal de Ruyter ziekenhuis Goes
Laboratorium voor Medische Microbiologie en Immunologie Tilburg, Elisabeth-TweeSteden Ziekenhuis
Leiden Universitair Medisch Centrum
Meander Medisch Centrum Amersfoort
Medisch Centrum Alkmaar
Slingeland Ziekenhuis Doetinchem
Streeklaboratorium voor de Volksgezondheid Amsterdam
Streeklaboratorium voor de Volksgezondheid Deventer
Streeklaboratorium voor de Volksgezondheid Haarlem
Radboud Universitair Medisch Centrum
Rijnstate Microbiologisch en Immunologisch Laboratorium (MIL)
Universitair Medisch Centrum Utrecht
Zaans Medisch Centrum Zaandam
Ziekenhuis Gelderse Vallei Ede
Ziekenhuis Rivierenland

Appendix D Stichting HIV Monitoring

The ATHENA cohort is managed by Stichting HIV Monitoring and supported by a grant from the Dutch Ministry of Health, Welfare and Sport through the Centre for Infectious Disease Control of the National Institute for Public Health and the Environment.

CLINICAL CENTRES

* denotes site coordinating physician

Amsterdam UMC, AMC site, Amsterdam:

HIV treating physicians: M. van der Valk*, S.E. Geerlings, A. Goorhuis, J.W. Hovius, B. Lempkes, F.J.B. Nellen, T. van der Poll, J.M. Prins, P. Reiss, M. van Vugt, W.J. Wiersinga, F.W.M.N. Wit.

HIV nurse consultants: M. van Duinen, J. van Eden, A. Hazenberg, A.M.H. van Hes, F.J.J. Pijnappel, S.Y. Smalhout, A.M. Weijnsfeld.

HIV clinical virologists/chemists: S. Jurriaans, N.K.T. Back, H.L. Zaaijer, B. Berkhout, M.T.E. Cornelissen, C.J. Schinkel, K.C. Wolthers.

Amsterdam UMC, VUmc site, Amsterdam:

HIV treating physicians: E.J.G. Peters*, M.A. van Agtmael, M. Bomers, K.C.E. Sigaloff.

HIV nurse consultants: M. Heitmuller, L.M. Laan.

HIV clinical virologists/chemists: C.W. Ang, R. van Houdt, M. Jonges, J. van Prehn.

Emma Kinderziekenhuis (Amsterdam UMC, AMC site):

HIV treating physicians: T.W. Kuijpers, D. Pajkrt H.J. Scherpbier.

HIV nurse consultants: C. de Boer, A. van der Plas, A.M. Weijnsfeld.

Admiraal De Ruyter Ziekenhuis, Goes:

HIV treating physicians: M. van den Berge*, A. Stegeman.

HIV nurse consultants: S. Baas, L. Hage de Looff.

HIV clinical virologists/chemists: B. Wintermans, J. Veenemans.

Catharina Ziekenhuis, Eindhoven:

HIV treating physicians: M.J.H. Pronk*, H.S.M. Ammerlaan.

HIV nurse consultants: E.S. de Munnik.

HIV clinical virologists/chemists: A.R. Jansz, J. Tjhie, M.C.A. Wegdam, B. Deiman, V. Scharnhorst.

DC Klinieken Lairese - Hiv Focus Centrum:

HIV treating physicians: A. van Eeden*, M. van der Valk.

HIV nurse consultants: W. Brokking, L.J.M. Elsenburg, H. Nobel.

HIV clinical virologists/chemists: M. Damen.

ETZ (Elisabeth-TweeSteden Ziekenhuis), Tilburg:

HIV treating physicians: M.E.E. van Kasteren*, M.A.H. Berrevoets, A.E. Brouwer.

HIV nurse consultants: A. Adams, B.A.F.M. de Kruijf-van de Wiel, S. Keelan-Pfaf, B. van de Ven.

Data collection: B.A.F.M. de Kruijf-van de Wiel, B. van der Ven.

HIV clinical virologists/chemists: A.G.M. Buiting, J.L. Murck, D. Versteeg.

Erasmus MC, Rotterdam:

HIV treating physicians: T.E.M.S. de Vries-Sluijs*, H.I. Bax, E.C.M. van Gorp, J.L. Nouwen, B.J.A. Rijnders, C.A.M. Schurink, A. Verbon, N.C. de Jong-Peltenburg.

HIV nurse consultants: N. Bassant, J.E.A. van Beek, M. Vriesde, L.M. van Zonneveld.

Data collection: H.J. van den Berg-Cameron, J. de Groot.

HIV clinical virologists/chemists: C.A.B. Boucher, M.P.G. Koopmans, J.J.A. van Kampen.

Erasmus MC–Sophia, Rotterdam:

HIV treating physicians: P.L.A. Fraaij, A.M.C. van Rossum, C.L. Vermont.

HIV nurse consultants: L.C. van der Knaap, E. Visser.

Flevoziekenhuis, Almere:

HIV treating physicians: J. Branger*, R.A. Douma.

HIV nurse consultant: C.J.H.M. Duijf-van de Ven.

HagaZiekenhuis, Den Haag:

HIV treating physicians: E.F. Schippers*, C. van Nieuwkoop.

HIV nurse consultants: J.M. van IJperen, J. Geilings.

Data collection: G. van der Hut.

HIV clinical virologist/chemist: N.D. van Burgel.

HMC (Haaglanden Medisch Centrum), Den Haag:

HIV treating physicians: E.M.S. Leyten*, L.B.S. Gelinck, F. Mollema.

HIV nurse consultants: S. Davids-Veldhuis, G.S. Wildenbeest.

HIV clinical virologists/chemists: E. Heikens.

Isala, Zwolle:

HIV treating physicians: P.H.P. Groeneveld*, J.W. Bouwhuis, A.J.J. Lammers.

HIV nurse consultants: S. Kraan, A.G.W. van Hulzen, M.S.M. Kruiper.

Data collection: G.L. van der Bliet, P.C.J. Bor.

HIV clinical virologists/chemists: P. Bloembergen, M.J.H.M. Wolfhagen, G.J.H.M. Ruijs.

Leids Universitair Medisch Centrum, Leiden:

HIV treating physicians: F.P. Kroon*, M.G.J. de Boer, H. Scheper, H. Jolink.

HIV nurse consultants: W. Dorama, N. van Holten.

HIV clinical virologists/chemists: E.C.J. Claas, E. Wessels.

Maasstad Ziekenhuis, Rotterdam:

HIV treating physicians: J.G. den Hollander*, K. Pogany, A. Roukens.

HIV nurse consultants: M. Kastelijns, J.V. Smit, E. Smit, D. Struik-Kalkman, C. Tearno.

Data collection: T. van Niekerk.

HIV clinical virologists/chemists: O. Pontesilli.

Maastricht UMC+, Maastricht:

HIV treating physicians: S.H. Lowe*, A.M.L. Oude Lashof, D. Posthouwer.

HIV nurse consultants: R.P. Ackens, K. Burgers, J. Schippers.

Data collection: B. Weijenberg-Maes.

HIV clinical virologists/chemists: I.H.M. van Loo, T.R.A. Havenith.

MC Zuiderzee, Lelystad:

HIV treating physicians: S. Weijer*, R. El Moussaoui. *HIV nurse consultant:* A.S. Bosma.

Medisch Centrum Leeuwarden, Leeuwarden:

HIV treating physicians: M.G.A.van Vonderen*, L.M. Kampschreur.

HIV nurse consultants: S. Faber, R. Steeman-Bouma.

HIV clinical virologists/chemists: J Weel.

Medisch Spectrum Twente, Enschede:

HIV treating physicians: G.J. Kootstra*, C.E. Delsing.

HIV nurse consultants: M. van der Burg-van de Plas, H. Heins.

Noordwest Ziekenhuisgroep, Alkmaar:

HIV treating physicians: W. Kortmann*, G. van Twillert*, R. Renckens.

HIV nurse consultant and data collection: D. Ruiter-Pronk, F.A. van Truijen-Oud.

HIV clinical virologists/chemists: J.W.T. Cohen Stuart, ER. Jansen, M. Hoogewerf, W. Rozemeijer, W. A. van der Reijden, J.C. Sinnige.

OLVG, Amsterdam:

HIV treating physicians: K. Brinkman*, G.E.L. van den Berk, W.L. Blok, P.H.J. Frissen, K.D. Lettinga, W.E.M. Schouten, J. Veenstra, S.M.E. Vrouwenraets.

HIV nurse consultants: C.J. Brouwer, G.F. Geerders, K. Hoeksema, M.J. Kleene, M. Knapen, I.B. van der Meché, E. Mulder-Seeleman, A.J.M. Toonen, S. Wijnands.

HIV clinical virologists: D. Kwa.

Radboudumc, Nijmegen:

HIV treating physicians: R. van Crevel*, K. van Aerde, A.S.M. Dofferhoff, S.S.V. Henriët, H.J.M. ter Hofstede, J. Hoogerwerf, M. Keuter, O. Richel.

HIV nurse consultants: M. Albers, K.J.T. Grintjes-Huisman, M. de Haan, M. Marneef, R. Strik-Albers.

HIV clinical virologists/chemists: J. Rahamat-Langendoen, F.F. Stelma.

HIV clinical pharmacology consultant: D. Burger.

Rijnstate, Arnhem:

HIV treating physicians: E.H. Gisolf*, R.J. Hassing, M. Claassen.

HIV nurse consultants: G. ter Beest, P.H.M. van Bentum, N. Langebeek.

HIV clinical virologists/chemists: R. Tiemessen, C.M.A. Swanink.

Spaarne Gasthuis, Haarlem:

HIV treating physicians: S.F.L. van Lelyveld*, R. Soetekouw.

HIV nurse consultants: L.M.M. van der Prijt, J. van der Swaluw.

Data collection: N. Bermon.

HIV clinical virologists/chemists: W.A. van der Reijden, R. Jansen, B.L. Herpers, D.Veenendaal.

Medisch Centrum Jan van Goyen, Amsterdam:

HIV treating physicians: D.W.M. Verhagen, F.N. Lauw.

HIV nurse consultants: M.C. van Broekhuizen, M. van Wijk.

Universitair Medisch Centrum Groningen, Groningen:

HIV treating physicians: W.F.W. Bierman*, M. Bakker, J. Kleinnijenhuis, E. Kloeze, A. Middel, E.H. Scholvinck, Y. Stienstra, C.L. A.R. Verhage, Vermont, K.M. Wouthuyzen-Bakker.

HIV nurse consultants: A. Boonstra, H. de Groot-de Jonge, P.A. van der Meulen, D.A. de Weerd.

HIV clinical virologists/chemists: H.G.M. Niesters, C.C. van Leer-Buter, M. Knoester.

Universitair Medisch Centrum Utrecht, Utrecht:

HIV treating physicians: A.I.M. Hoepelman*, J.E. Arends, R.E. Barth, A.H.W. Bruns, P.M. Ellerbroek, T. Mudrikova, J.J. Oosterheert, M.J.A. de Regt, E.M. Schadd, M.A.D. van Zoelen.

HIV nurse consultants: K. Aarsman, B.M.G. Griffioen-van Santen, I. de Kroon, C.S.A.M. van Rooijen.

Data collection: M. van Berkel, C.S.A.M. van Rooijen.

HIV clinical virologists/chemists: R. Schuurman, F. Verduyn-Lunel, A.M.J. Wensing.

Wilhelmina Kinderziekenhuis, UMC Utrecht, Utrecht:

HIV treating physicians: L.J. Bont, S.P.M. Geelen, Y.G.T. Loeffen, T.F.W. Wolfs.

HIV nurse consultants: N. Nauta.

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Director: P. Reiss.

Deputy director: S. Zaheri.

Data analysis: A.C. Boyd, D.O. Bezemer, A.I. van Sighem, C. Smit, F.W.M.N. Wit.

Data management and quality control: M. Hillebregt, A. de Jong, T. Woudstra.

Data monitoring: D. Bergsma, R. Meijering, L. van de Sande, T. Rutkens, S. van der Vliet.

Data collection: L. de Groot, M. van den Akker, Y. Bakker, A. El Berkaoui, M. Bezemer, N. Brétin, E. Djoechro, J. Geerlinks, E. Kruijne, C. Lodewijk, E. Lucas, R. van der Meer, L. Munjshvili, F. Paling, B. Peeck, C. Ree, R. Regtop, Y. Ruijs, M. Schoorl, P. Schnörr, E. Tuijn, L. Veenenberg, E.C. Witte.

Patient registration: B. Tuk.

Appendix E Nivel Primary Care Database (Nivel-PCD)

Data collection and processing

Rodrigo Davids
Tom Urbanus

Researchers

Dr. Mark Nielen
Dr. Gé Donker

Project management

Dr. Mark Nielen
Dr. Gé Donker
Dr. Joke Korevaar
Dr. Tjard Schermer

Appendix F STI publications (co-)authored by RIVM employees 2018

A pill for the partner via the chlamydia patient? Results from a mixed method study among sexual health care providers in the Netherlands. Nanhoe AC, Visser M, Omlo J, Watzeels JCM, van den Broek IV, Götz HM. BMC Infect Dis 2018 May 29;18(1):243. doi: 10.1186/s12879-018-3139-0.

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Chlamydia trachomatis antibody detection in home-collected blood samples for use in epidemiological studies. Hoenderboom BM, Ess EF, van den Broek IVF, van Loo IHM, Cjpa H, Ouburg S, Morr  SA. J Microbiol Methods 2018 Jan; 144:164-167. doi: 10.1016/j.mimet.2017.11.022. Epub 2017 Nov 28.

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Epidemiologie van seksueel overdraagbare infecties. van Bergen JEAM, de Vries HJC, van Benthem BHB. Ned Tijdschr Geneeskd 2018 May 29;162(22):D2736.

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Donken R, King AJ, Bogaards JA, Woestenberg PJ, Meijer CJLM, de Melker HE. *J Infect Dis*. 2018 Apr 23;217(10):1579-1589. doi: 10.1093/infdis/jiy067.

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Heijne JCM, van den Broek IVF, Bruisten SM, van Bergen JEA, de Graaf H, van Benthem BHB. *Sex Transm Infect*. 2019 Feb;95(1):53-59. doi: 10.1136/sextrans-2017-053478. Epub 2018 Jun 20.

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Rosinska M, Pantazis N, Janiec J, Pharris A, Amato-Gauci AJ, Quinten C, ECDC HIV/AIDS Surveillance Network. *Euro Surveill* 2018 Jun 7;23(23). doi:10.2807/1560-7917.ES.2018.23.23.1700359.

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STIs in sex partners notified for chlamydia exposure: implications for expedited partner therapy.

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Study protocol of the iMPaCT study: a longitudinal cohort study assessing psychological determinants, sexual behaviour and chlamydia (re)infections in heterosexual STI clinic visitors.

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Substantial Heterogeneity in Progress Toward Reaching the 90-90-90 HIV Target in the WHO European Region.

Porter K, Gourlay A, Attawell K, Hales D, Supervie V, Touloumi G, Rosinska M, Vourli G, van Sighem A, Pharris A, Noori T, the ECDC Dublin Declaration Monitoring Network. *J AIDS* 2018 Sep 1;79(1):28-37. doi: 10.1097/QAI.0000000000001761.

Trends and determinants of antimicrobial susceptibility of *Neisseria gonorrhoeae* in the Netherlands, 2007 to 2015. Hofstraat SH, Götz HM, van Dam AP, van der Sande MA, van Benthem BH. *Euro Surveill* 2018 Sep 6;23(36). doi: 10.2807/1560-7917.ES.2018.23.36.1700565.

Trends in human immunodeficiency virus diagnoses among men who have sex with men in North America, Western Europe, and Australia, 2000-2014. Chapin-Bardales J, Schmidt AJ, Guy RJ, Kaldor JM, McGregor S, Sasse A, Archibald C, Rank C, Casabona Barbarà, J, Folch-Toda C, Vives, Nuria, Cowan SA, Cazein F, Velter A, an der Heiden M, Gunsenheimer-Bartmeyer B, Marcus U, Op de Coul ELM, Van Sighem A, Aldir I, Cortes Martins H, Berglund T, Velicko I, Gebhardt M, Delpech V, Hughes G, Nardone A, Hall HI, Johnson AS, Sullivan PS. *Annals of Epidemiology* 2018 Dec; 28(12): 874-880. doi:10.1016/S1047279718307737.

Update on neonatal herpes simplex epidemiology in the Netherlands: a health problem of increasing concern? van Oeffelen L, Biekram M, Poeran J, Hukkelhoven C, Galjaard S, van der Meijden W, and Op de Coul E. *Pediatr Infect Dis J* 2018 Jan 18;37(8):806-813. doi: 10.1097/INF.0000000000001905.

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**I.A.L. Slurink, F. van Aar, J.C.M. Heijne,
E.L.M. Op de Coul, D.A. van Wees,
B.M. Hoenderboom, M. Visser,
C. den Daas, P.J. Woestenberg,
H.M. Götz, M. Nielen, A.I. van Sighem,
B.H.B. van Benthem**
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RIVM Report 2019-0007

Published by

**National Institute for Public Health
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P.O. Box 1 | 3720 BA Bilthoven
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June 2019

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