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Sexually transmitted *infections*

in the Netherlands in 2019

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Synopsis

Sexually transmitted infections in the Netherlands in 2019

In 2019, the number of people tested at a Sexual Health Centre (SHC) for a sexually transmitted infection (STI) remained almost the same as in 2018. The percentage with an STI increased slightly. Chlamydia remained the most common STI among heterosexuals. Gonorrhoea was the most common infection among men who have sex with men (MSM). At general practitioner (GP) practices the number of STI consultations increased among all age groups.

The SHCs offer complimentary STI testing to people with a high risk of an STI, for example those aged under 25. In 2019 a total of 150,782 consultations were recorded at the SHCs. The number of consultations among women and heterosexual men declined, whereas an increase was noted among MSM. An STI was detected in 19 percent of the consultations. Infections were found most frequently in people who had been notified for STI. In addition to the SHC figures, estimates about the number of STI consultations and diagnoses performed by GPs have been made based on data from 323 GP practices in 2018. The majority of STI consultations are performed by GPs.

Chlamydia

In 2019 the SHCs performed 21,134 chlamydia diagnoses and this number is comparable with 2018. The percentage of women and heterosexual men with chlamydia remained stable during the past 3 years (at 15 and 18 percent respectively). For MSM, the percentage has remained stable at 10 percent for many years. The number of estimated diagnoses performed by GPs increased in 2018 compared to 2017 (42,500 versus 39,800).

Gonorrhoea

The number of diagnoses of gonorrhoea made at SHCs increased by 11 percent in 2019 to 8,186 infections. The percentage of people with gonorrhoea increased over the past two years, to 2.3 percent among heterosexual men (1.9 in 2017) and 1.9 percent among women (1.6 in 2017). The percentage of infections among MSM has remained stable in recent years at around 11 percent (11.5 in 2019). The estimated number of infections diagnosed by GPs increased from 9,550 in 2017 to 11,300 in 2018. This increase was mainly observed among women younger than 25. At SHCs, none of those infected showed resistance to the current 'first choice' antibiotic for gonorrhoea (ceftriaxone). However, there was resistance to other antibiotics. Resistance to ciprofloxacin increased significantly from 34 percent in 2018 to 55 percent in 2019.

Syphilis

In 2019 the number of syphilis diagnoses at SHCs increased by 16.8 percent compared to 2018 (1,430 versus 1,224), with 96 percent of these infections being diagnosed in MSM. The percentage of MSM with syphilis decreased from 2.9 percent in 2016 to 2.4 percent in 2018 and 2.5 percent in 2019. The percentage was higher primarily among MSM with HIV (7.5 percent in 2019 compared to 6.7 percent in 2018). The percentage of women and heterosexual men with the infection remained low in 2019, at 0.1 and 0.3 percent respectively.

HIV

The number of new HIV diagnoses made by the SHCs declined by 34 percent (164) in 2019. Of these, 152 diagnoses were among MSM. The number of diagnoses among women and heterosexual men remained low. The number of people with HIV who came for treatment at one of the Dutch HIV treatment centres ('in care') for the first time in 2019 was 972. This was more than in 2018 (911). In total, 20,724 people with HIV were registered in care in 2019.

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

Publiekssamenvatting

Seksueel overdraagbare aandoeningen in Nederland in 2019

In 2019 hebben vrijwel evenveel mensen zich bij een Centrum voor Seksuele Gezondheid (CSG) laten testen op seksueel overdraagbare aandoeningen (soa) als in 2018. Het percentage dat daadwerkelijk een soa had, is licht gestegen. Chlamydia bleef de meest voorkomende soa onder heteroseksuelen. Bij mannen die seks hebben met mannen (MSM) kwam gonorroe het meest voor. Bij huisartspraktijken nam het aantal soa-consulten toe onder alle leeftijden.

Bij CSG's kunnen mensen die een grotere kans hebben op een soa, bijvoorbeeld jongeren onder de 25, zich gratis laten testen. In 2019 zijn er in totaal 150.782 consulten geregistreerd bij de CSG's. Het aantal consulten nam af onder vrouwen en heteroseksuele mannen, maar nam toe bij MSM. Bij 19 procent van de consulten is een soa gevonden. Infecties zijn het vaakst gevonden bij mensen die zijn gewaarschuwd voor een soa. Naast de CSG-cijfers worden schattingen gemaakt van het aantal soa-consulten en -diagnoses die de huisartsen uitvoeren. Hiervoor zijn gegevens gebruikt van 323 huisartspraktijken in 2018. Huisartsen voeren het merendeel van de soa-consulten uit.

Chlamydia

In 2019 waren er 21.134 chlamydia-diagnoses bij de CSG's, vergelijkbaar met 2018. Het percentage vrouwen en heteroseksuele mannen met chlamydia bleef in de afgelopen 3 jaar stabiel (respectievelijk 15 en 18 procent). Voor MSM ligt dit percentage al jaren rond de 10 procent. Het aantal geschatte diagnoses door huisartsen nam in 2018 toe ten opzichte van 2017 (42.500 versus 39.800).

Gonorroe

Het aantal gonorroe-diagnoses bij de CSG's is het afgelopen jaar met 11 procent toegenomen tot 8.186 infecties. Ook het percentage met gonorroe steeg ten opzichte van afgelopen twee jaar; onder heteroseksuele mannen naar 2,3 procent (1,9 in 2017), en onder vrouwen naar 1,9 procent (1,6 in 2017). Het percentage onder MSM is de afgelopen jaren stabiel gebleven rond de 11 procent (11,5 in 2019). Het geschatte aantal infecties bij de huisartsen nam toe van 9.550 in 2017 naar 11.300 in 2018. Deze toename was vooral onder vrouwen jonger dan 25 jaar. Bij de CSG's is geen antibioticaresistentie tegen het huidige 'eerste keus' antibioticum voor gonorroe (ceftriaxon) gemeld. Wel is er resistentie tegen andere antibiotica. De resistentie tegen ciprofloxacine steeg fors van 34 procent in 2018 naar 55 procent in 2019.

Syfilis

In 2019 is het aantal syfilis-diagnoses bij de CSG's met 16,8 procent gestegen ten opzichte van 2018 (1.430 versus 1.224). Daarvan is 96 procent bij MSM vastgesteld. Het percentage met syfilis onder MSM daalde van 2,9 procent in 2016 naar 2,4 procent in 2018 en 2,5 procent in 2019. Voornamelijk onder MSM met hiv was het percentage hoger (7,5 procent in 2019 ten opzichte van 6,7 procent in 2018). Het percentage vrouwen en heteroseksuele mannen met de infectie bleef in 2019 laag, respectievelijk 0,1 en 0,3 procent.

Hiv

Het aantal nieuwe hiv-diagnoses dat de CSG's stelde, is in 2019 (164) met 34 procent afgenomen ten opzichte van 2018. Hiervan waren 152 diagnoses bij MSM. Het aantal diagnoses onder vrouwen en heteroseksuele mannen bleef laag. Het aantal mensen met hiv dat in 2019 voor het eerst voor behandeling bij een van de Nederlandse hiv-behandelcentra kwam ('in zorg') was 972. Dat was meer dan in 2018 (911). In totaal zijn in 2019 20.724 mensen met hiv geregistreerd als in zorg.

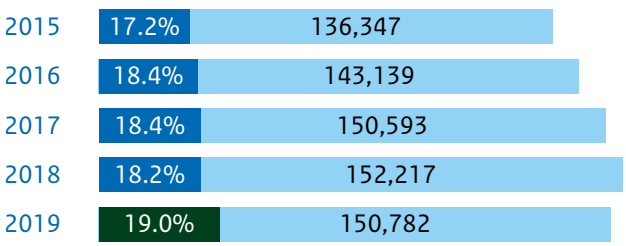
Kernwoorden: soa, chlamydia, gonorroe, syfilis, hiv, aids, antibioticaresistentie, jongeren, MSM, monitoring, centrum seksuele gezondheid.

Surveillance of STI in the Netherlands 2019

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

SHC

Number of **SHC consultations***



In 2019:

Women: **16.8%**

Heterosexual men: **20.0%**

MSM: **21.2%**

Number of **GP consultations**

Chlamydia

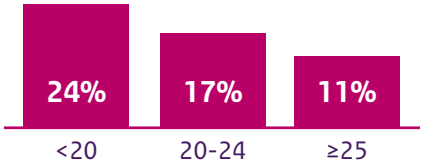
SHC: **21,134**

GP: **42,500**

Of diagnoses

Women & Hetero-sexual men <25 year

% women & heterosexual men with chlamydia decreases with age



% with chlamydia

Women: **15%**

Heterosexual men: **18%**

MSM: **10%**

% among notified attendees: **34%**

LGV among MSM: **419**

60% HIV-negative

Gonorrhoea

SHC: **8,186**

GP: **11,300**

Of diagnoses

MSM

% with gonorrhoea

MSM: **11.5%**

- Known HIV-positive: **19%**
- With symptoms: **24%**

Women: **1.9%** Heterosexual men: **2.3%**

% among notified attendees: **30%**

No resistance to ceftriaxone

Syphilis

SHC: **1,430**

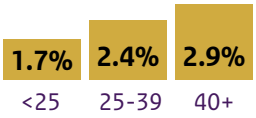
Of diagnoses

MSM

% with syphilis

MSM: **2.5%**

- Known HIV-positive: **7.5%**



% with syphilis increases with age

Women: **0.1%** Heterosexual men: **0.3%**

% among notified MSM: **12%**

HIV

SHC: **164**

HIV treatment centres

Of diagnoses

MSM

% with HIV

MSM: **0.3%**

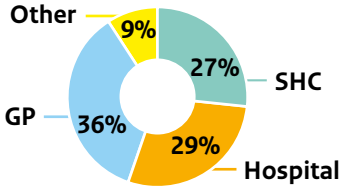
- Originating from NL Antilles/Aruba/ Latin America: **1.4%**

% among notified MSM: **4.0%**

New patients in care: **972**

- MSM: **64%**

Where are people diagnosed?

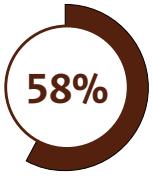


Number of AIDS patients: **76**

Genital warts

GP: **44,700** SHC: **928**

Of diagnoses



men

Genital herpes

GP: **27,950** SHC: **316**

Of diagnoses

women

Acute hepatitis B

GP, hospital and SHC: **108**

Transmission route
Sexual contact

Acute hepatitis C

GP, hospital and SHC: **43**

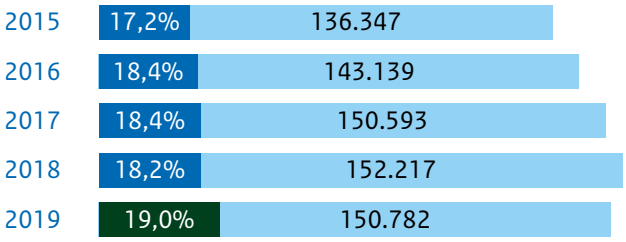
Transmission route
Sexual contact between men

Surveillance van soa in Nederland 2019

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

CSG

Aantal **CSG-consulten***



In 2019:

Vrouwen: **16,8%**

Heteroman: **20,0%**

MSM: **21,2%**

Aantal **huisartsconsulten**

Chlamydia

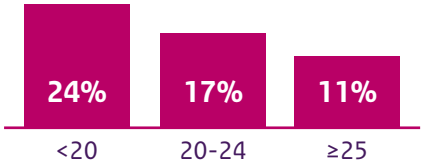
CSG: **21.134**

Huisarts: **42.500**

van de diagnoses

Vrouwen & Heteromannen <25 jaar

% vrouwen en heteromannen met chlamydia neemt af met leeftijd



% met chlamydia

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

% onder gewaarschuwde bezoekers: **34%**

LGV bij MSM: **419**
60% hiv-negatief

Gonorroe

CSG: **8.186**

Huisarts: **11.300**

van de diagnoses

MSM

% met gonorroe

MSM: **11,5%**

- Bekend hiv-positief: **19%**
- Met klachten: **24%**

Vrouwen: **1,9%** Heteromannen: **2,3%**

% onder gewaarschuwde bezoekers: **30%**

Geen resistentie tegen ceftriaxon

Syfilis

CSG: **1.430**

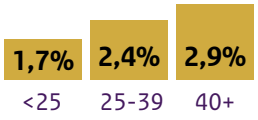
van de diagnoses

MSM

% met syfilis

MSM: **2,5%**

- Bekend hiv-positief: **7,5%**



% met syfilis neemt toe met leeftijd

Vrouwen: **0,1%** Heteromannen: **0,3%**

% onder gewaarschuwde MSM: **12%**

Hiv

CSG: **164**

van de diagnoses

MSM

% met hiv

MSM: **0,3%**

- Afkomstig uit NL Antillen/Aruba/ Latijns Amerika: **1,4%**

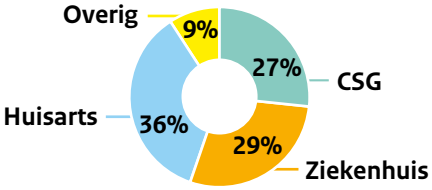
% onder gewaarschuwde MSM: **4,0%**

Hiv-behandelcentra

Patiënten nieuw in zorg: **972**

- MSM: **64%**

Waar worden mensen gediagnosticeerd?

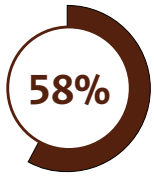


Aantal aids patiënten: **76**

Genitale wratten

Huisarts: **44.700** CSG: **928**

van de diagnoses



mannen

Genitale herpes

Huisarts: **27.950** CSG: **316**

van de diagnoses

vrouwen

Acute hepatitis B

Huisarts, ziekenhuis en CSG: **108**

Transmissieroute seksueel contact

Acute hepatitis C

Huisarts, ziekenhuis en CSG: **43**

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 2019. 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.n*l.
This report can be downloaded in PDF format from *www.rivm.nl/soa*.

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Comments
Please send any comments or suggestions to *soap@rivm.nl*.

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Summary

In 2019, a total of 150,782 consultations took place at Dutch Sexual Health Centres (SHCs); similar to the number of consultations held in 2018 (-0.9%). The number of consultations increased among MSM (+10.1%), but decreased among heterosexual men (-11.3%) and women (-4.7%). Of all SHC visitors, 44% were female (65,461 consultations), 20% heterosexual male (29,317 consultations) and 37% MSM (54,906 consultations). At 654 consultations (0.3%), the client was a transgender person. Following the implementation of the General Data Protection Regulation (GDPR) in May 2018, 24,153 (16%) consultations were not registered in the national database, because the client did not give consent to share data for surveillance purposes. To avoid a break in trends, the number of tests and the positivity rates of chlamydia, gonorrhoea, syphilis and HIV, by gender and sexual preference, also includes aggregated data of non-registered consultations. All other figures and tables using SHC data are based on the 126,629 registered consultations among 100,908 unique SHC visitors. Of all MSM who were tested at the SHCs in 2019, 34.9% had multiple consultations (33.3% in 2018). Among women and heterosexual men, the percentage was 11.9% (10.5% in 2018) and 7.7% (7.1% in 2018) respectively.

Of the SHC visitors, 19.0% tested positive for STI (chlamydia, gonorrhoea, infectious syphilis, HIV or infectious hepatitis B) in 2019. There was an overall increasing trend from 12.0% in 2010 to 16.8% in 2019 among women and from 12.8% in 2010 to 20.0% in 2019 among heterosexual men. Among MSM, the positivity rate has varied between 19.2% and 21.2% since 2010 (21.2% in 2019). The STI positivity rate was highest in notified persons (34.5%), or those with STI/HIV-related symptoms (27.6%), in people with a previous HIV diagnosis (35.1%) and in people who reported an STI diagnosis in the past year (27.2%). Since July 2019, SHCs have started to provide PrEP to individuals at high risk of acquiring HIV. By December 31st, 2,797 individuals (97.9% MSM) had had a first PrEP consultation in the national PrEP pilot programme at SHCs.

The total number of STI-related episodes recorded by general practitioners (GPs) based on a sample of 323 GP practices in the Netherlands, extrapolated to the Dutch population, is more than twice the number of consultations reported at SHCs, with an estimated 334,700 episodes (STI diagnoses and 'fear of STI') in 2018. This is an increase from the 307,400 episodes recorded in 2017 and 281,300 episodes recorded in 2016. The increased reporting rate of STI-related episodes per 1,000 population at GP practices was found both among people aged below 25 (18.3 in 2018 versus 16.9 in 2017) and among people aged 25 years or older (20.0 in 2018 versus 18.5 in 2017).

Bacterial STI

In 2019, chlamydia was diagnosed 21,134 times at the SHCs, which was similar to the number in 2018 (21,021). The positivity rate among women and heterosexual men has remained stable in the past three years; 15% among women, 18% in heterosexual men and around 10% in MSM. The highest positivity rates were found in persons notified for chlamydia (36.5% in women,

35.8% in heterosexual men and 25.1% in MSM). High positivity rates were also seen among heterosexual adolescents (24.6% among girls and 25.1% among boys aged under 19 years). Almost 25% of MSM with chlamydia were co-infected with gonorrhoea, 4.8% with syphilis and 0.9% were newly diagnosed with HIV. The number of lymphogranuloma venereum (LGV, an infection caused by an invasive strain of chlamydia) diagnoses further increased by 34% to 419 in 2019. The percentage HIV-negative MSM among LGV positives has continued to increase, from 21% in 2013 to 60% in 2019. The percentage of asymptomatic rectal LGV cases increased from 33% in 2010 to 61% in 2019. The number of estimated chlamydia episodes reported in general practice (42,500) increased compared with the previous years. Reporting rates of chlamydia episodes per 1,000 population mainly increased among people aged under 25 (from 3.3 in 2017 to 3.6 in 2018).

The number of gonorrhoea diagnoses at the SHCs increased by 11.2% to 8,186 diagnoses in 2019 compared with 2018. Positivity rates for gonorrhoea slightly increased over the past two years among heterosexual men 2.3% (1.9% in 2017) and among women 1.9% (1.6% in 2017). Positivity rates in MSM have been stable at around 11% for the past few years (11.5% in 2019). Since 2015, gonorrhoea has been the most frequently reported STI among MSM attending SHCs. In general practice, the number of estimated gonorrhoea-episodes greatly increased, from 9,550 in 2017 to 11,300 in 2018, an increase of 18.5%. This increase was mainly due to an increase of episodes among women younger than 25. Antimicrobial resistance to ceftriaxone, the first-choice antibiotic for gonorrhoea treatment, has not been reported among SHC visitors. Resistance to cefotaxime and azithromycin remained stable at 1.4% and 9.3% respectively. However, higher proportions of isolates with reduced susceptibility were seen in 2019 compared with previous years. Resistance to ciprofloxacin greatly increased, from 33.7% in 2018 to 54.9% in 2019.

In 2019, 1,430 syphilis infections were diagnosed at the SHCs, an increase of 16.8% from 2018 (1,224). Of all cases, 96.4% were among MSM. The syphilis positivity rate among MSM decreased from 2.9% in 2016 to 2.4% in 2018 and 2.5% in 2019. Among HIV-positive MSM, there was an increase in the positivity rate (7.5% in 2019 compared with 6.7% in 2018). Syphilis positivity rates among HIV-negative MSM remained stable (1.8% in 2018 and 2.0% in 2019). The number of tests among women (n=24,903) and heterosexual men (n=13,607) decreased compared with 2018 (28,786 and 16,906 tests respectively). The number of syphilis diagnoses among heterosexual men was 26 in 2018 and 35 in 2019; among women this decreased from 22 in 2018 to 17 in 2019. Data on the number of syphilis episodes reported in general practice are lacking.

Viral STI

At the SHCs, 164 new HIV-infections were diagnosed in 2019, a decrease of 34% compared to 2018 (224). Of these, 93% were among MSM. The HIV positivity rate among MSM at the SHCs continued to decline to 0.3% in 2019 (0.8% in 2017 and 0.5% in 2018). HIV positivity rates among women and heterosexual men remained very low, both at 0.03%. There were 972 newly registered HIV-positive individuals in care at the HIV treatment centres of the HIV Monitoring Foundation in 2019 (911 in 2018). Of these, 482 were diagnosed in 2019, a decline

compared with last year (527), though this number can still increase due to reporting delay. The proportion of MSM (64%) was lower compared with 2018 (69%). Overall, 46% of newly diagnosed patients presented late for care (CD4 <350/mm3 or AIDS). This proportion was lower for MSM (37%) than it was for women (59%) or for heterosexual men (54%). In 2018, an estimated 92% of those living with HIV in the Netherlands had been diagnosed and linked to care. Of these, 93% started therapy and 96% had a suppressed viral load.

Most cases of genital warts and genital herpes are registered by the GP. In 2018, an estimated 44,700 cases of genital warts (42,000 in 2017), and 27,950 cases of genital herpes (25,800 in 2017) 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 (74% of all cases). In 2019, the number of diagnoses of genital warts and genital herpes at the SHCs was 928 and 316 respectively (based on registered consultations only).

The number of reported acute hepatitis B cases in the registration of notifiable diseases in 2019 (108) was comparable to 2018 (104 cases). Sexual contact remained the most reported transmission route (57%). The number of reported acute hepatitis C cases was lower in 2019 (43) than those reported in 2018 (62). The main reported transmission route for acute hepatitis C was unprotected sexual contact between men (74%).

Conclusion

The total number of STI consultations at SHCs has been stable for the past three years, with an increasing trend among MSM and decreasing trends among heterosexual men and women. The percentage with at least one STI increased slightly in 2019 compared to previous years, but the direction of individual STI trends differed by STI. The number of STI-related episodes at the GP continued to increase. By 31 December 2019, 2,797 individuals (98% MSM) had had a first PrEP consultation in the national PrEP pilot programme at SHCs. It is important to maintain an integrated surveillance of STIs and STI risk among high-risk groups that visit the SHCs. Further efforts are needed to ensure that people in high-risk groups are effectively targeted. It is also important to keep track of the general population, who test mainly through other care providers or self-testing, via regular population surveys. 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 2019 hebben er in totaal 150.782 consulten plaatsgevonden bij de Centra Seksuele Gezondheid (CSG's); vergelijkbaar met het aantal consulten in 2018 (-0,9%). Het aantal consulten nam toe onder MSM (+10,1%) en nam af onder heteroseksuele mannen (-11,3%) en vrouwen (-4,7%). Van alle CSG-bezoekers was 44% vrouw (65.461 consulten), 20% heteroseksuele man (29.317 consulten) en 37% MSM (54.906 consulten). Er waren 654 soa-consulten (0,3%) bij transgender personen. De Algemene Verordening Gegevensbescherming (AVG) is van kracht per mei 2018, waardoor 24.153 (16%) 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, gonorroe, 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 (126.629 consulten). Deze consulten zijn uitgevoerd bij 100.908 unieke personen. Onder alle MSM die zich in 2019 bij CSG's lieten testen had 34,9% meerdere consulten (33.3% in 2018). Onder vrouwen en heteroseksuele mannen was dit 11,9% (10,5% in 2018) en 7,7% (7,1% in 2018) respectievelijk.

Het percentage personen met een positieve soa-test (chlamydia, gonorroe, infectieuze syfilis, hiv of infectieuze hepatitis B) was 19,0% in 2019. Het soa-vindpercentage steeg van 12,0% in 2010 naar 16,8% in 2019 onder vrouwen en van 12,8% in 2010 naar 20,0% in 2019 onder heteroseksuele mannen. Het percentage MSM met één of meerdere soa varieert tussen 19,2% en 21,2% over de jaren (21,2% in 2019). De hoogste vindpercentages werden gezien bij personen die gewaarschuwd waren voor soa (34,5%), of klachten rapporteerden (27,6%), onder hiv-positieve personen (35,1%) en personen met een soa diagnose in het afgelopen jaar (27,2%). Sinds juli 2019 is er een nationaal Pre-Expositie Profylaxe (PrEP) pilot programma gestart bij de CSG's voor personen die een hoog risico lopen op een hiv-infectie. Op 31 december 2019 hadden 2.797 personen (98% MSM) hun eerste PrEP consult gehad binnen dit programma.

Het totale aantal soa-gerelateerde episodes dat bij de huisarts werd geregistreerd gebaseerd op een selectie van 323 huisartsenpraktijken geëxtrapoleerd naar de Nederlandse populatie is meer dan het dubbele van het aantal bij de CSG's, met naar schatting 334.700 episodes (infecties en 'angst voor soa') in 2018. Dit is een toename ten opzichte van 2017 (307.400 episodes) en 2016 (281.300 episodes). Het aantal soa-gerelateerde episodes per 1.000 inwoners steeg zowel onder personen onder de 25 jaar (18,3 in 2018 versus 16,9 in 2017) als bij personen ouder dan 25 (20,0 in 2018 versus 18,5 in 2017).

Bacteriële soa

In 2019 zijn er 21.134 chlamydia-diagnoses gesteld bij de CSG's, vergelijkbaar met 2018 (21.021).

Het vindpercentage onder vrouwen en heteroseksuele mannen is stabiel gebleven in de afgelopen drie jaar; rond 15% bij vrouwen, 18% bij heteroseksuele mannen en 10% bij MSM. De meeste infecties werden geregistreerd bij personen die waren gewaarschuwd voor chlamydia (36,5% in vrouwen, 35,8% in heteroseksuele mannen en 25,1% in MSM). Daarnaast was het vindpercentage hoog onder heteroseksuele jongeren (24,6% bij meisjes en 25,1% bij jongens jonger dan 19 jaar). Onder MSM met chlamydia had bijna 25% een gonorroe co-infectie, 4,8% syfilis co-infectie en 0,9% een HIV diagnose. Het aantal lymfogranuloma venereum (LGV, een infectie met een invasieve chlamydia variant) diagnoses nam toe met 34% tot 419 in 2019. Het percentage hiv-negatieve MSM onder LGV diagnoses bleef toenemen van 21% in 2013 naar 60% in 2019. Asymptomatische rectale LGV is toegenomen van 33% in 2010 tot 61% in 2019. Het geschatte aantal chlamydia episodes gerapporteerd door huisartsen (42.500) nam toe ten opzichte van de afgelopen jaren. Het aantal chlamydia-episodes per 1.000 inwoners steeg voornamelijk bij mensen onder de 25 jaar (3,3 in 2017 tot 3,6 in 2018).

Het aantal gonorroe diagnoses bij de CSG's is met 11,2% toegenomen tot 8.186 diagnoses in 2019 vergeleken met 2018. Het gonorroe-vindpercentage nam de afgelopen twee jaar toe onder heteroseksuele mannen naar 2,3% (1,9% in 2017), en onder vrouwen naar 1,9% (1,6% in 2017). Het vindpercentage onder MSM is de afgelopen jaren stabiel rond de 11% (11,5% in 2019). Sinds 2015 is gonorroe de meest gerapporteerde soa onder MSM. Het aantal geschatte gonorroe-episodes bij de huisarts nam fors toe van 9.550 in 2017 naar 11.300 in 2018, een toename van 18,5%. Deze toename is voornamelijk te wijten aan de toename van episodes onder vrouwen jonger dan 25 jaar. Antibioticaresistentie tegen ceftriaxon, het huidige eerste keus antibioticum voor de behandeling van gonorroe, is nog niet gerapporteerd bij CSG-bezoekers. Resistentie tegen cefotaxim en azitromycine bleef stabiel, 1,4%, en 9,3% respectievelijk. Echter werden in 2019 naar verhouding meer stammen met een verminderde gevoeligheid gevonden in vergelijking met eerdere jaren. Resistentie tegen ciprofloxacine nam fors toe van 33,7% in 2018 naar 54,9% in 2019.

In 2019 werden er 1.430 syfilis infecties gediagnosticeerd bij de CSG's, een toename van 16,8% in vergelijking met 2018 (1,224). Hiervan werd 96,4% vastgesteld onder MSM. Het syfilis-vindpercentage onder MSM nam af van 2.9% in 2016 naar 2.4% in 2018 en 2.5% in 2019. Het vindpercentage onder bekend hiv-positieve MSM nam toe (van 6,7% in 2018 naar 7,5% in 2019). Het syfilis-vindpercentage onder hiv-negatieve MSM bleef stabiel (1,8% in 2018 en 2,0% in 2019). Het aantal testen onder vrouwen (n=24.903) en heteroseksuele mannen (n=13.607) nam af in vergelijking met 2018 (28.786 en 16.906 testen respectievelijk). Het aantal syfilis diagnoses onder heteroseksuele mannen was 26 in 2018 en 35 in 2019; onder vrouwen was dit 22 in 2018 en 17 in 2019. Een schatting van het aantal syfilis infecties bij de huisartsen is niet beschikbaar.

Virale soa

Bij de CSG's werden 164 nieuwe hiv infecties gevonden in 2019, een afname van 34% in vergelijking met 2018 (224). Hiervan werd 93% bij MSM vastgesteld. Het hiv-vindpercentage onder MSM bij de CSG's bleef dalen tot 0,3% in 2019 (van 0,8% in 2017 en 0,5% in 2018). Vindpercentages onder vrouwen en heteroseksuele mannen bleven zeer laag (beide 0,03%). In

2019 zijn 972 nieuwe hiv-patiënten aangemeld in zorg bij Stichting HIV Monitoring (SHM) (911 in 2018). Van hen waren 482 personen ook gediagnosticeerd in 2019 (dit was 527 in 2018), maar dit aantal kan nog oplopen door rapportagevertraging. In vergelijking met 2018 (69%) werd minder van de nieuw gediagnosticeerde hiv-infecties vastgesteld bij MSM (64%). Van de nieuw gediagnosticeerde patiënten kwam 46% laat in zorg (CD4 < 350/mm3 of aids). Dit percentage was lager voor MSM (37%) dan voor vrouwen (59%) en heteroseksuele mannen (54%). Geschat wordt dat in 2018 92% van alle personen met hiv in Nederland gediagnosticeerd en in zorg was. Van hen was 93% ook gestart met behandeling, en daarvan had 96% een onderdrukte virale lading.

Voor genitale wratten en genitale herpes wordt veruit het grootste deel van de diagnoses gesteld bij de huisarts. In 2018 waren er naar schatting 44.700 diagnoses van genitale wratten (42.000 in 2017) en 27.950 diagnoses van genitale herpes (25.800 in 2017). Huisartsen rapporteerden genitale wratten vaker bij mannen dan bij vrouwen (58%), terwijl genitale herpes vaker bij vrouwen werd gezien (74%). In 2019 was het aantal diagnoses van genitale wratten en genitale herpes bij de CSG's 928 en 316 respectievelijk (gebaseerd op geregistreerde consulten).

Het aantal acute hepatitis B infecties in de aangiftecijfers 2019 (108) was vergelijkbaar met 2018 (104). Onbeschermd seksueel contact was de meest gerapporteerde transmissieroute (57%). Het aantal acute hepatitis C gevallen was lager in 2019 (43) in vergelijking met 2018 (62). De belangrijkste transmissieroute van acute hepatitis C was onbeschermd seksueel contact tussen mannen (74%).

Conclusie

Het totaal aantal soa-consulten bij de CSG's bleef de laatste drie jaar stabiel. Daarbij was er een toename onder MSM en een afname onder heteroseksuele mannen en vrouwen. Het percentage met één of meer soa nam in 2019 licht toe in vergelijking met voorgaande jaren. De trends verschillen echter per soa. Bij huisartsen bleef het aantal soa-gerelateerde episodes toenemen. Op 31 december 2019, hadden 2.797 personen (98% MSM) hun eerste PrEP consult gehad in het nationale PrEP pilot programma bij de CSG's. Surveillance van soa en risico op soa onder hoog-risico groepen die de CSG's bezoeken is belangrijk. Verdere inspanningen zijn nodig om te zorgen dat hoog-risico groepen effectief bereikt worden. Voor een geïntegreerde soa surveillance is het daarnaast noodzakelijk om via bevolkingsonderzoeken zicht te houden op de algemene populatie, welke zich meer via andere zorgaanbieders of met een zelf-test laat testen. 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: These include Sexual Health Centres (SHCs), Stichting HIV Monitoring (SHM, HIV Monitoring Foundation), public health laboratories, general practitioners (GPs) 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 SHCs under the responsibility of the Public Health Services (PHSs) form 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.

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 2019 are presented. Data from GPs are shown for 2018. Chapters 3-5 present data on bacterial STI (chlamydia, gonorrhoea and syphilis) and Chapters 6-10 focus on viral STI (HIV, genital warts, genital herpes, hepatitis B and hepatitis C). Conclusions and recommendations are given 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 conducted among high-risk groups embodied in the nationwide system of Sexual Health Centres (SHCs). 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 (Stichting HIV Monitoring) to gain insights into trends among HIV-positive individuals in care. Other additional data sources include the national Health Survey, weekly virological laboratory reports, the Gonococcal Resistance to Antimicrobials Surveillance (GRAS) programme, 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 SHCs in each region is responsible for the coordination of STI surveillance (Figure 1.1). In total, 24 SHCs, 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 financial restrictions, the SHCs 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 migrants 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 testing.[1] 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. Before 2011, a self-defined ethnicity was recorded for each client. Since 1 January 2011, the migration background has been based on the client's and the client's parents' country of birth, according to the classification of Statistics Netherlands.[2] The classification distinguishes between first and a second generation. The first generation consists of persons who are born abroad and have at least one parent who is also born abroad. The second generation consists of persons who are born in the Netherlands and have at least one parent belonging to the first generation. 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 were tested repeatedly at the same clinic. We discuss the number of repeated visits and the STI positivity by number of consultations in Chapter 2.

Since July 2019, a national PrEP pilot programme has been implemented in the Netherlands at the SHCs. SHCs provide pre-Exposure Prophylaxis (PrEP) for HIV to high-risk groups. Before PrEP is provided, eligibility criteria are checked and STI testing is performed. During consultation, STI and HIV test results are discussed and, if HIV-negative, PrEP tablets are provided. During trimonthly follow-up consultations STI-tests and HIV-tests are conducted.[1]

In this report, the results of SHCs 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 SHCs under national surveillance from 2010 to 2019. In May 2018, the General Data Protection Regulation (GDPR) (AVG in Dutch) was implemented in the Netherlands. Initially, the interpretation of the GDPR resulted in a switch from opting-out to opting-in: all SHC attendees had to give consent to share their consultation data with RIVM for surveillance purposes since May 2018. This switch led to high numbers of non-consenting attendees in some regions, jeopardizing the interpretability of data and the continuation of regional and national STI/HIV surveillance and therefore STI and HIV control - a task of general interest. For this reason, the SHCs switched back to opting-in from July 2019 onwards. For this report, aggregated anonymised data of non-registered consultations were obtained from the SHCs on total chlamydia, LGV, gonorrhoea, syphilis, and HIV tests diagnoses, stratified by gender and sexual preference. Aggregated data of non-registered consultations is added to registered consultations to calculate the total number of consultations and positivity rates of chlamydia, LGV, gonorrhoea, syphilis and HIV by gender and sexual preference. Demographic and behavioural indicators were not available for non-registered consultations. Therefore, all other tables and figures regarding trends in

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

2 Statistics Netherlands: *https://www.cbs.nl/nl-nl/achtergrond/2016/47/afbakening-generaties-met-migratieachtergrond*

positivity rates by risk profiles are based on registered consultations only. Where aggregated data of non-registered consultations have been added to registered consultations, this is indicated.

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

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 SHCs. 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 "loverboys". 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 SHCs.

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), 2018), i.e. substance use, physical activity, nutrition, accidents and sexual health. A standard set of indicators is collected for each of these topics, annually.[3] The 2018 sexual health data were collected for a total of 3,813 men and 4,202 women aged between 16 and 85. We present a selection of the 2018 results in this report with the aim of describing the characteristics related to sexual health and STI healthcare of the general population in the Netherlands. Data were weighted for demographic characteristics to correct for differences between the sample and the 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 the 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) codes.[5] 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

[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, 2018.

[4] Meijer, W. M., Verberne, L. D. M., & Weesie, Y. M. Zorg door de huisarts. Uit: Zorg door de huisarts-Nivel Zorgregistraties Eerste Lijn: Jaarcijfers 2018 en trendcijfers 2014-2018. Uit: Nivel Zorgregistraties eerste lijn. [internet]. 2020 [Geraadpleegd op 30-04-2020]. URL: *https://www.nivel.nl/sites/default/files/Jaarrapport%20Huisarts_2018.pdf*

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

in the population covered by this network from 2010 to 2018 are included in this 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, 367 in 2017 and 323 in 2018. Incidence rates were calculated based on the number of episodes of illness per 1,000 population.[6] Annual estimates of the total number of episodes at GP practices in the Netherlands were made by extrapolating the reporting rates at 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 men.[7]

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 codes with:

- an appropriate chlamydia-related prescription, i.e. azithromycin or doxycycline, at GP practices with good quality morbidity and prescription data (all 323 practices in 2018)
- or: a positive chlamydia laboratory result. Because only some of the practices have sufficient laboratory reports (267 practices in 2018), the number of chlamydia infections based on a positive laboratory result was extrapolated to all practices with good quality morbidity and prescription data.

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 19 participating laboratories. The coverage of these laboratories and representativeness for the Dutch population are 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 chlamydia.[8] There is an overlap between the laboratories reporting in this system and the laboratories connected to the SHCs.

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6 Nielen MMJ, Spronk I, Davids R, Korevaar JC, Poos R, Hoeymans N, Opstelten W, van der Sande MAB, Biermans MCJ, Schellevis FG, Verheij RA. Estimating Morbidity Rates Based on Routine Electronic Health Records in Primary Care: Observational Study. JMIR Med Inform. 2019 Jul 26;7(3):e11929. doi: 10.2196/11929. PMID: 31350839

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 See website: *https://www.rivm.nl/virologische-weekstaten*

1.6 Antimicrobial resistance of gonococci

Concerns about increasing resistance to quinolones at the (inter)national level led to an RIVM laboratory survey of the resistance of gonococci in 2002.[9] 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. In 2019, 17 out of 24 SHCs participated in GRAS, which together diagnosed 83% of all SHC gonorrhoea cases. Gonorrhoea is usually diagnosed using Polymerase Chain Reaction (PCR). Within GRAS, additional culture and susceptibility testing of isolates is performed using E-tests. Resistance levels are calculated using the European Committee on Antimicrobial Susceptibility Testing (EUCAST) breakpoints for resistance.[10] 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 (0.04% refused HIV-tests and 0.00% refused hepatitis B and syphilis testing in 2017).[11] The screening programme is coordinated by the Centre for Population Screening (CvB) at the RIVM.

1.8 Congenital syphilis

The RIVM-IDS (Centre for Infectious Diseases Research, Diagnostics and Screening) offers Immunoglobulin M (IgM) diagnostics for neonates and young infants (<1 year) who may have been exposed to syphilis. We present national results from 2010-2019 in this report.

[9] 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].

[10] The European Committee on Antimicrobial Susceptibility Testing. Breakpoint tables for interpretation of MICs and zone diameters. Version 10.0, 20209. *https://www.eucast.org/clinical_breakpoints/*

[11] Van der Ploeg CPB, Schönbeck Y, Oomen P, Vos K. PSIE Procesmonitor 2017. Belangrijkste resultaten Prenatale Screening Infectieziekten en Erytrocytenimmunisatie (PSIE) over 2017. TNO/RIVM 2018.

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 24 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 CIb at the RIVM.[12] The number of people living with HIV in the Netherlands in 2018 was estimated by using the European Centre for Disease Prevention and Control (ECDC) HIV Modelling Tool.[13]

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 the 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 Stichting HIV Monitoring (SHM).

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 has also been mandatory. Since 2002, all PHSs have given notifications of HBV and HCV infections using the

[12] van Sighem A.I., Boender T.S., Wit F.W.N.M., Smit C., Matser A., Reiss P. HIV Monitoring Report 2019, Human Immunodeficiency Virus (HIV) Infection in the Netherlands. Amsterdam: Stichting HIV Monitoring, 2019. Available online at *www.hiv-monitoring.nl*

[13] 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*

web-based application OSIRIS. Since chronic HBV infections are already reported in the annual report of the National Immunisation Programme in the Netherlands[14], this report only includes notification data of acute HBV. Data on chronic HCV cases are included in this report next to acute HCV infections from 2019 on.

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 (SW). Heterosexuals with an STI indication were also considered a risk group until October 2007, and drug users until January 2012. PHSs and SHCs 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 the 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 2010-2018 are reported.

[14] 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 2019, 150,782 consultations were performed at the SHCs; similar to the number of consultations in 2018 (-0.9%). The number of consultations increased among MSM (+10.1%), but decreased among heterosexual men (-11.3%) and women (-4.7%).
- Of these consultations, 126,629 (84%) were registered by SHCs under national surveillance. Client consent to share data for surveillance purposes was not obtained for 24,153 (16%) consultations (n=17,188; 11% in 2018).
- The percentages of non-registered consultations were equal between categories of gender, sexual preference and age; 16% in women, 15% in both heterosexual men and MSM, 16% in both people aged under 25 and people aged 25 and older.
- In 654 consultations, the client was a transgender person. Of these consultations, 164 (25%) were not registered.

The following key points are based on registered consultations only.

- Key characteristics of attendees were as follows: female (44%), young age (51% <25 years), Dutch origin (69%), ≥3 sexual partners in the previous 6 months (61%), previously tested for gonorrhoea/chlamydia/syphilis in the past year (46%), STI/HIV-related symptoms (25%).
- The percentage of clients with at least one STI increased from 13.6% in 2010 to 19.0% in 2019. STI positivity fluctuates around 20% among MSM (21.2% in 2019; 20.6% in 2018). There was an overall increasing trend from 12.0% in 2010 to 16.8% in 2019 among women and from 12.8% in 2010 to 20.0% in 2019 among heterosexual men.
- The STI positivity was highest in notified persons (34.5%), or those with STI/HIV-related symptoms (27.6%), in people with a previous HIV diagnosis (35.1%) and in people who reported an STI diagnosis in the past year (27.2%).
- Of all MSM, 73.4% reported receptive anal sex and 79.7% insertive anal sex, 23.1% and 23.3% of whom, respectively, reported consistent condom use. Women and heterosexual men reported very low consistent condom use in vaginal sex (7.7% and 6.7% respectively). Consistent condom use with oral sex was low (2.6% of women and 0.9% of MSM).
- Of all MSM, 30.3% reported group sex and 28.9% reported drug use in relation to sex in the preceding 6 months. STI positivity rates were higher among MSM reporting these behaviours.
- The percentage of SHC attendees who reported being notified by a partner increased from 10.8% in 2010 to 21.7% in 2016, but slightly decreased after that to 18.2% in 2019. The positivity rate among notified clients was stable and high (35.2% in women; 33.0 in heterosexual men; 35.1% in MSM).

- Among clients diagnosed with an STI, 33.0% were detected through partner notification. Among MSM, 31.8% of all newly diagnosed HIV infections were attributable to clients who were notified about STI exposure.
- Of all MSM who tested at the SHCs in 2019, 34.9% had multiple consultations (33.3% in 2018). Among women and heterosexual men, this was 11.9% (10.5% in 2018) and 7.7% (7.1% in 2018) respectively.
- Of all transgender clients (n=490), 47.6% had a non-Western migration background and 44.9% reported performing sex work in the previous 6 months. The STI positivity rate among transgender clients was 16.5% and 10 new HIV infections were diagnosed.
- In 2019, the SHCs registered 7,771 and 2,654 Sense consultations among women and men respectively. The registration of Sense consultations is not uniform across SHCs.

2.1.2 General practice

- In 2018, the number of STI-related episodes in general practice (based on ICPC coded episodes of fear of STI and STI diagnoses recorded in the Nivel Primary Care Database (Nivel-PCD) was estimated at 334,700 in the Netherlands, an increase compared with 2017. This increase occurred both among people aged <25 years and those aged 25 and older.

2.1.3 Health Survey

- In 2018, 13.6% of women aged 16-29 years reported having been tested for an STI in the previous year, and 6.6% were tested for HIV. For heterosexual men aged 16-29 years, the percentages were lower; 6.7% for STI and 3.7% for HIV. Higher proportions were seen among men attracted to men aged 16-44, with 24.1% testing for STI as well as for HIV in the past year. Percentages were highest in the age categories 16-29 and 30-44 years compared with the older age categories.

2.1.4 Regional comparisons

- In 2019, the number of STI consultations per 1,000 inhabitants aged 15-65 was by far the highest in Amsterdam (66.6); an increase compared with 2017 (47.0) and 2018 (57.0). For other regions, this number ranged from 2.7 in Drenthe to 18.9 in Flevoland.
- STI positivity rates ranged by region between 14.0% and 20.4% among women, between 17.0% and 26.3% among heterosexual men and between 19.4% and 23.6% among MSM in 2019.
- Regions varied in the percentage of attendees with a low level of education, in age distribution, and the percentage of people who were notified of STI/HIV exposure or reported STI-related symptoms.

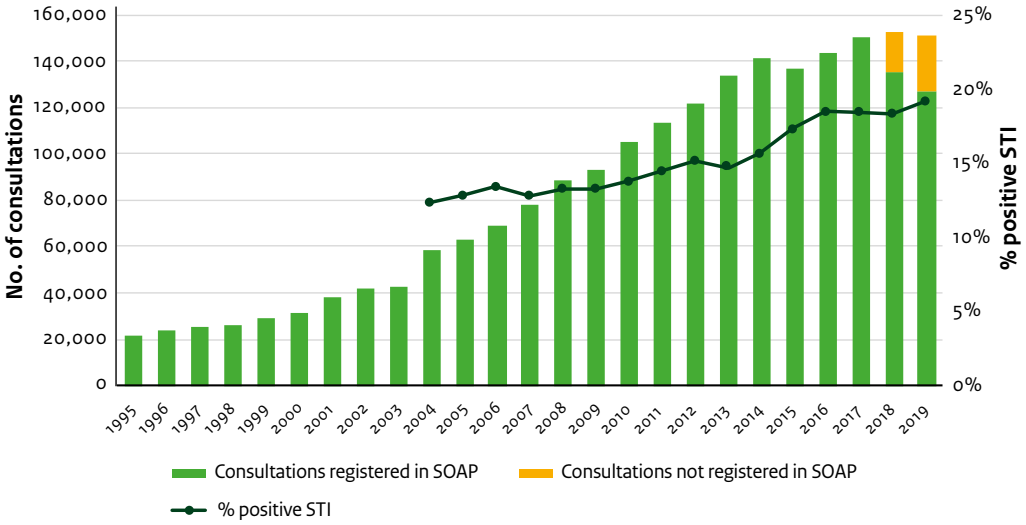
2.1.5 PrEP consultations

- SHCs have started to provide PrEP to individuals who run a high risk of acquiring HIV since July 2019. By December 31st, 2,797 individuals (97.9% MSM) had had a first PrEP consultation in the national PrEP pilot programme at SHCs. A total of 3,696 PrEP consultations were performed, including both start consultations and trimonthly follow-up visits.
- Unprotected sex with a partner with unknown HIV-status was the most frequently reported PrEP indication (53.4%).

- The majority had already used PrEP in the past 3 months (55.8%); 40% reported no PrEP use in the past year.
- There were two persons newly diagnosed with HIV at PrEP start consultation. There were no HIV seroconversions while on PrEP.
- At follow-up consultation, 56.9% reported daily PrEP use in the past 3 months, 38.5% reported event-driven PrEP use and 3.1% reported both daily and event-driven PrEP use (1.4% missing).
- HIV-negative MSM who did not use PrEP in the past 3 months reported lower risk behaviour compared with both MSM who were participating in the PrEP pilot programme at SHCs and MSM who used PrEP in the past 3 months via other health care providers.
- In addition, the rate of chlamydia, gonorrhoea and infectious syphilis was lower in HIV-negative MSM who did not use PrEP compared with MSM who did use PrEP.

2.2 Consultations and characteristics of Sexual Health Centre attendees

Figure 2.1 Registered and non-registered number of consultations and percentage of positive STI tests in the national STI surveillance in the Netherlands, 1995–2019



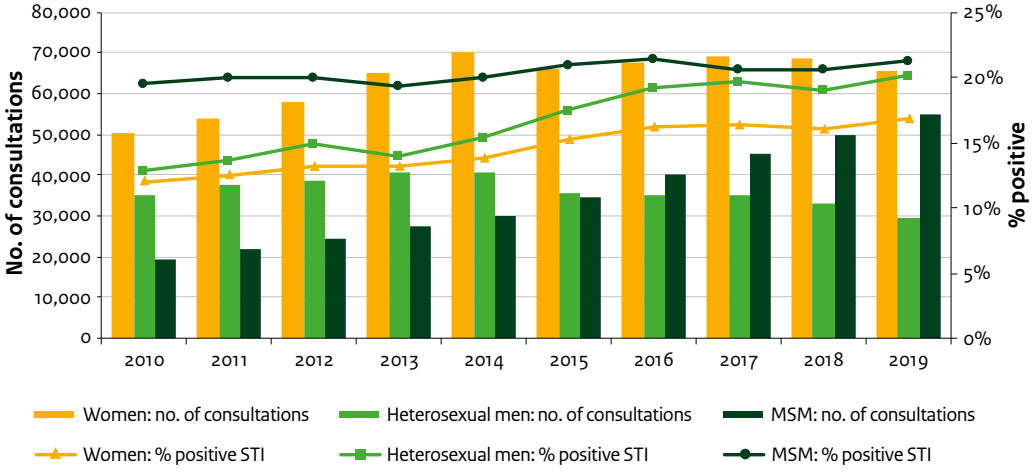
Footnote 1: 1995–2002: STI registration; 2000: STI clinic Erasmus Medical Centre Rotterdam was included; 2003: Implementation of STI sentinel surveillance network; 2004–2018: National STI surveillance network.
Footnote 2: STI include: chlamydia, gonorrhoea, infectious syphilis, HIV and infectious hepatitis B.
Footnote 3: The percentage of positive STI for 2019 was calculated based on consultations registered in SOAP only; for 2018 aggregated numbers of non-registered consultations were also included.

Table 2.1 Number of consultations by gender and type of sexual contact, 2015-2019

Gender and type of sexual contact	2015 n (%)	2016 n (%)	2017 n (%)	2018 n (%)	2019 n (%)
Women	65,991 (48.4)	67,600 (47.2)	69,375 (46.1)	68,710 (45.1)	65,461 (43.5)
Heterosexual men	35,719 (26.2)	35,065 (24.5)	35,242 (23.4)	33,041 (21.7)	29,317 (19.5)
MSM	34,442 (25.3)	40,340 (28.2)	45,553 (30.2)	49,873 (32.8)	54,906 (36.5)
Transgender*	50 (0.04)	56 (0.04)	416 (0.3)	484 (0.3)	654 (0.4)
Unknown*	145 (0.11)	78 (0.05)	7 (0.0)	109 (0.1)	25 (0.0)
Total	**136,347**	**143,139**	**150,593**	**152,217**	**150,363**

Footnote: Available aggregated data of non-registered consultations included for 2018 and 2019.
* Categories 'transgender' and 'unknown' are disregarded in the rest of the tables.

Figure 2.2 Number of consultations and percentage of positive STI tests by gender and type of sexual contact, 2010–2019

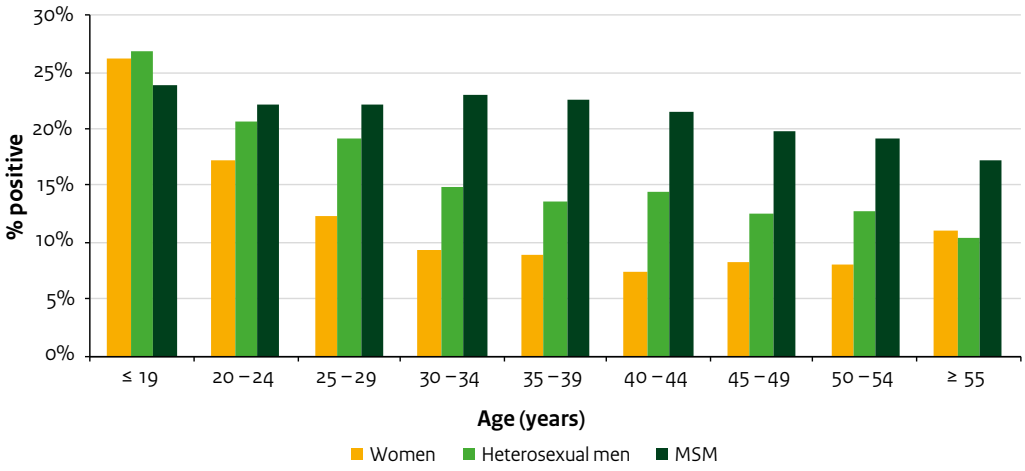


Footnote 1: STI include: chlamydia, gonorrhoea, infectious syphilis, HIV and infectious hepatitis B.
Footnote 2: Available aggregated data of non-registered consultations included in the number of consultations. The percentage of positive STI for 2019 was calculated based on consultations registered in SOAP only; for 2018 aggregated numbers of non-registered consultations were also included.

Table 2.2 Number of consultations by age, gender and type of sexual contact, 2019

Age (years)	Women n (%)	Heterosexual men n (%)	MSM n (%)
≤ 19	7,754 (14.2)	2,244 (9.1)	1016 (2.2)
20–24	33,054 (60.4)	14,402 (58.1)	6,394 (13.7)
25–29	7,544 (13.8)	4,715 (19.0)	8,737 (18.7)
30–34	2,282 (4.2)	1,579 (6.4)	6,986 (15.0)
35–39	1,248 (2.3)	770 (3.1)	5,086 (10.9)
40–44	805 (1.5)	365 (1.5)	4,489 (9.6)
45–49	758 (1.4)	240 (1.0)	3,945 (8.5)
50–54	685 (1.3)	196 (0.8)	3,960 (8.5)
≥ 55	557 (1.0)	271 (1.1)	6,036 (12.9)
Total	**54,687**	**24,782**	**46,649**

Figure 2.3 Percentage of positive STI tests by age, gender and type of sexual contact, 2019



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, 2019

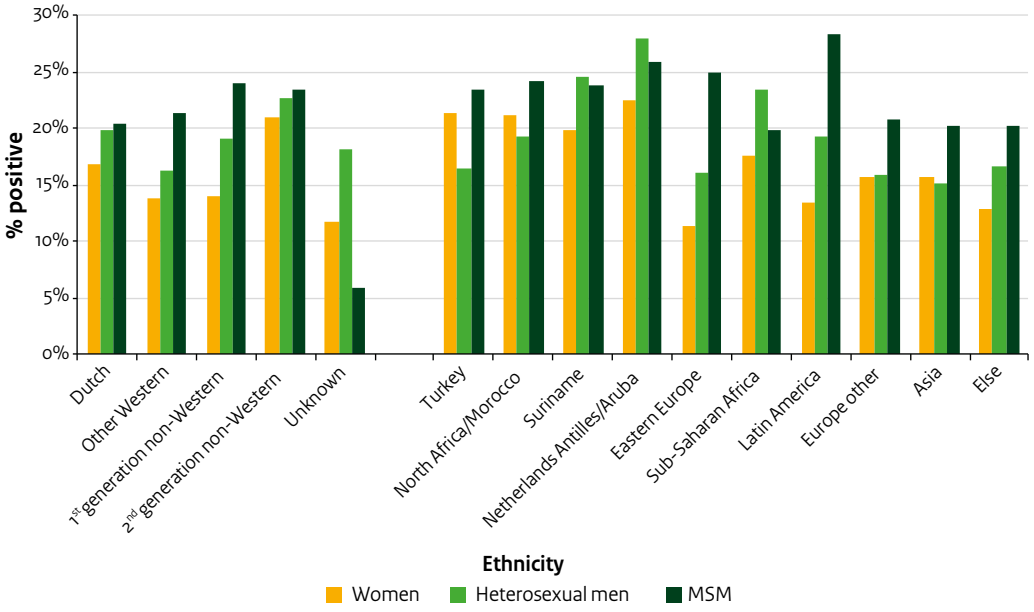
Ethnicity	Women n (%)	Heterosexual men n (%)	MSM n (%)
The Netherlands	**40,478 (74.0)**	**15,852 (64.0)**	**30,988 (66.4)**
Turkey	**587 (1.1)**	**738 (3.0)**	**785 (1.7)**
First generation	75 (12.8)	125 (16.9)	256 (32.6)
Second generation	512 (87.2)	613 (83.1)	529 (67.4)
North Africa/Morocco	**821 (1.5)**	**964 (3.9)**	**755 (1.6)**
First generation	84 (10.2)	150 (15.6)	325 (43.0)
Second generation	737 (89.8)	814 (84.4)	430 (57.0)
Suriname	**1,945 (3.6)**	**1,513 (6.1)**	**1,220 (2.6)**
First generation	335 (17.2)	356 (23.5)	496 (40.7)
Second generation	1,610 (82.8)	1,157 (76.5)	724 (59.3)
Netherlands Antilles/Aruba	**1,321 (2.4)**	**1,026 (4.1)**	**1,032 (2.2)**
First generation	519 (39.3)	533 (51.9)	804 (77.9)
Second generation	802 (60.7)	493 (48.1)	228 (22.1)
Eastern Europe	**1,869 (3.4)**	**422 (1.7)**	**1,507 (3.2)**
First generation	1,487 (79.6)	272 (64.5)	1,380 (91.6)
Second generation	380 (20.3)	149 (35.3)	127 (8.4)
Sub-Saharan Africa	**1,142 (2.1)**	**1,030 (4.2)**	**654 (1.4)**
First generation	435 (38.1)	490 (47.6)	474 (72.5)
Second generation	706 (61.8)	540 (52.4)	180 (27.5)
Latin America	**1,278 (2.3)**	**480 (1.9)**	**1,725 (3.7)**
First generation	858 (67.1)	259 (54.0)	1,558 (90.3)
Second generation	419 (32.8)	221 (46.0)	166 (9.6)
Europe other	**2,634 (4.8)**	**1,296 (5.2)**	**3,863 (8.3)**
First generation	1,326 (50.3)	672 (51.9)	3,015 (78.0)
Second generation	1,308 (49.7)	623 (48.1)	848 (22.0)
Asia	**2,044 (3.7)**	**1,227 (5.0)**	**3,359 (7.2)**
First generation	811 (39.7)	615 (50.1)	2,131 (63,4)
Second generation	1,233 (60.3)	612 (49.9)	1,228 (36.6)
Else	**536 (1.0)**	**223 (0.9)**	**745 (1.6)**
First generation	233 (43.5)	116 (52.0)	646 (86.7)
Second generation	303 (56.5)	107 (48.0)	99 (13.3)

Table 2.3 (continued) Number of consultations by ethnicity, generation, gender and type of sexual contact, 2019

Ethnicity	Women n (%)	Heterosexual men n (%)	MSM n (%)
Unknown	**32 (0.1)**	**11 (0.0)**	**16 (0.0)**
Total	**54,687**	**24,782**	**46,649**

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 2.4 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, 2019



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, 2019

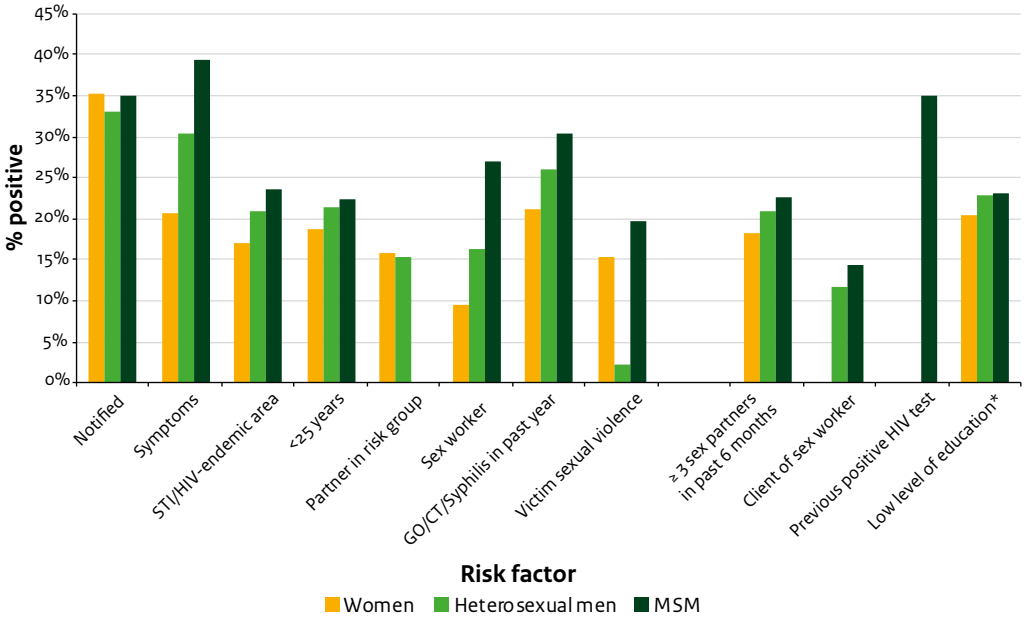
	Women n (%)	Heterosexual men n (%)	MSM n (%)
Notified			
No	45,983 (84.1)	18,095 (73.0)	38,590 (82.7)
Yes	8,346 (15.3)	6,594 (26.6)	8,023 (17.2)
Unknown	358 (0.7)	93 (0.4)	36 (0.1)

Table 2.4 (continued) Reported triage indication by gender and type of sexual contact, 2019

	Women n (%)	Heterosexual men n (%)	MSM n (%)
Symptoms			
No	38,459 (70.3)	17,313 (69.9)	38,901 (83.4)
Yes	15,962 (29.2)	7,372 (29.7)	7,665 (16.4)
Unknown	266 (0.5)	97 (0.4)	83 (0.2)
STI/HIV-endemic area*			
No	43,680 (79.9)	17,382 (70.1)	35,612 (76.3)
Yes	11,007 (20.1)	7,400 (29.9)	11,037 (23.7)
<25 years			
No	13,879 (25.4)	8,136 (32.8)	39,239 (84.1)
Yes	40,808 (74.6)	16,646 (67.2)	7,410 (15.9)
Partner in risk group			
No	39,456 (72.1)	17,640 (71.2)	28,677 (61.5)
Yes	14,398 (26.3)	7,026 (28.4)	17,140 (36.7)
Unknown	833 (1.5)	116 (0.5)	832 (1.8)
Sex worker			
No	49,943 (91.3)	24,533 (99.0)	45,454 (97.4)
Yes, in past 6 months	4,550 (8.3)	154 (0.6)	893 (1.9)
Unknown	194 (0.4)	95 (0.4)	302 (0.6)
Gonorrhoea/chlamydia/syphilis in past year			
Not tested	33,756 (61.7)	18,445 (74.4)	13,865 (29.7)
Tested, negative	14,104 (25.8)	3,992 (16.1)	18,571 (39.8)
Tested, positive	6,407 (11.7)	2,222 (9.0)	12,894 (27.6)
Tested, unknown	76 (0.1)	13 (0.1)	306 (0.7)
Unknown	344 (0.6)	110 (0.4)	1,013 (2.2)
Victim of sexual violence			
No	53,068 (97.0)	24,610 (99.3)	41,077 (88.1)
Yes	1,154 (2.1)	46 (0.2)	172 (0.4)
Unknown	465 (0.9)	126 (0.5)	5,400 (11.6)
At least one indication (including MSM)			
No	1,851 (3.4)	846 (3.4)	0 (0.0)
Yes	52,836 (96.6)	23,936 (96.6)	46,649 (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 2.5 Percentage of positive STI tests by risk factor, gender and type of sexual contact, 2019



*Low level of education: no education, elementary school, lbo, mavo, vmbo, mbo-1.
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, 2019

	Women n (%)	Heterosexual men n (%)	MSM n (%)
Educational level*			
High	32,276 (59.0)	13,874 (56.0)	29,438 (63.1)
Medium	15,412 (28.2)	7,893 (31.8)	10,277 (22.0)
Low	3,990 (7.3)	2,189 (8.8)	3,744 (8.0)
Unknown	3,009 (5.5)	826 (3.3)	3,190 (6.8)
Number of partners in past 6 months			
0 partners	595 (1.1)	202 (0.8)	657 (1.4)
1 partner	14,131 (25.8)	4,583 (18.5)	3,469 (7.4)
2 partners	13,901 (25.4)	5,057 (20.4)	4,574 (9.8)
3 or more partners	24,280 (44.4)	14,855 (59.9)	37,332 (80.0)
Unknown	1,780 (3.3)	85 (0.3)	617 (1.3)

Table 2.5 (continued) Number of consultations by demographics, (sexual) behavioural characteristics, gender and type of sexual contact, 2019

	Women n (%)	Heterosexual men n (%)	MSM n (%)
Receptive anal sex, in past 6 months			
No receptive anal sex	42,827 (78.3)		11,781 (25.3)
Yes, consistently with a condom	1,350 (2.5)		7,908 (17.0)
Yes, not consistently with a condom	9,789 (17.9)		26,366 (56.5)
Unknown	721 (1.3)		594 (1.3)
Insertive anal sex, in past 6 months			
No insertive anal sex		20,066 (81.0)	8,957 (19.2)
Yes, consistently with a condom		457 (1.8)	8,659 (18.6)
Yes, not consistently with a condom		2,424 (9.8)	28,505 (61.1)
Unknown		1,835 (7.4)	528 (1.1)
Vaginal sex, in past 6 months**			
No vaginal sex	436 (0.8)	179 (0.7)	936 (13.3)
Yes, consistently with a condom	4,124 (7.5)	1,618 (6.5)	935 (13.3)
Yes, not consistently with a condom	49,479 (90.5)	22,673 (91.5)	4,444 (63.4)
Unknown	648 (1.2)	312 (1.3)	699 (10.0)
Receptive oral sex, in past 6 months			
No receptive oral sex	6,101 (11.2)		2,038 (4.4)
Yes, consistently with a condom	1,189 (2.2)		377 (0.8)
Yes, not consistently with a condom	45,218 (82.7)		43,525 (93.3)
Unknown	2,179 (4.0)		709 (1.5)
Client of sex worker			
No	41,332 (75.6)	23,134 (93.4)	45,021 (96.5)
Yes, in past 6 months	125 (0.2)	1,487 (6.0)	1,134 (2.4)
Unknown	13,230 (24.2)	161 (0.6)	494 (1.1)
Previous HIV test			
No	39,206 (71.7)	18,282 (73.8)	4,762 (10.2)
Yes, positive	27 (0.0)	13 (0.1)	4,286 (9.2)
Yes, negative	14,620 (26.7)	6,040 (24.4)	37,372 (80.1)
Yes, result unknown	143 (0.3)	48 (0.2)	68 (0.1)
Unknown	691 (1.3)	399 (1.6)	161 (0.3)

* Low: no education, elementary school, lbo, mavo, vmbo, mbo-1; medium: mbo-2-4, havo, vwo; high: university of applied sciences, university.

** For MSM: numbers are reported for men who had sex with both men and women (N=7,014). Men who had sex with men only are excluded.

Table 2.6 Number of consultations and percentage of positive tests among MSM by (sexual) behavioural characteristics, 2019

	MSM	
	n (%)	% STI
Total number of consultations	**46,649 (100.0)**	**21.2**
Anal sex in past 6 months		
No	3,150 (6.8)	10.0
Receptive anal sex only	5,772 (12.4)	19.2
Insertive anal sex only	8,612 (18.5)	16.0
Both insertive and receptive	28,453 (61.0)	24.6
Unknown	662 (1.4)	14.7
Group sex		
No	27,472 (58.9)	18.3
Yes	14,152 (30.3)	27.8
Unknown	5,025 (10.8)	18.3
Sex with HIV-positive MSM*		
No	8,813 (18.9)	19.6
Yes	3,086 (6.6)	31.4
Don't know	8,376 (18.0)	21.0
Missing	26,374 (56.5)	20.6
Drug use in relation to sex, in past 6 months**		
No	32,414 (69.5)	18.1
Yes	13,478 (28.9)	28.6
Unknown	757 (1.6)	20.7
Injected/slammed drugs in past 6 months*		
No	11,634 (24.9)	25.1
Yes	260 (0.6)	31.5
Missing	34,755 (74.5)	19.8

* Voluntary to ask and register in SOAP.
** Included drugs are cocaine, XTC/MDMA/ Speed, Heroin, Crystal Meth, Mephedrone, 3-MMC, 4-MEC, 4-FA, GHB/GBL and ketamine.
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, 2019

Educational level	Age group				
	≤ 19 n (% pos.)	20-24 n (% pos.)	25-34 n (% pos.)	≥35 n (% pos.)	Total n (% pos.)
Women					
Low	1,119 (30.9)	1,564 (20.3)	679 (13.4)	628 (9.6)	3,990 (20.4)
Medium	3,935 (27.7)	8,130 (21.6)	2,214 (15.4)	1,133 (11.0)	15,412 (21.5)
High	2,514 (21.4)	22,667 (15.4)	6,027 (10.7)	1,068 (7.3)	32,276 (14.7)
Heterosexual men					
Low	443 (30.2)	982 (22.8)	499 (22.0)	265 (12.5)	2,189 (22.9)
Medium	1,247 (27.2)	4,347 (25.1)	1,786 (21.5)	513 (14.2)	7,893 (23.9)
High	507 (22.5)	8,789 (18.4)	3,739 (16.0)	839 (12.4)	13,874 (17.5)
MSM					
Low	133 (22.6)	448 (28.3)	971 (26.5)	2,192 (20.4)	3,744 (23.0)
Medium	586 (26.5)	1,739 (25.3)	2,962 (26.4)	4,990 (21.3)	10,277 (23.8)
High	266 (19.9)	3,909 (19.8)	10,863 (21.0)	14,400 (19.4)	29,438 (20.0)

Footnote: Low level of education: no education, elementary school, lbo, mavo, vmbo, mbo-1; medium level of education: mbo 2-4, havo, vwo; high level of education: university of applied sciences, university.

Table 2.8a Number of 'big five' STI diagnoses and percentage of positive tests by gender and type of sexual contact, 2019

Diagnosis	Women n (% pos.)	Heterosexual men n (% pos.)	MSM n (% pos.)
Chlamydia	9,977 (15.3)	5,374 (18.4)	5,783 (10.6)
Gonorrhoea	1,262 (1.9)	658 (2.2)	6,266 (11.5)
Syphilis, infectious*	17 (0.1)	35 (0.3)	1,378 (2.5)
HIV	8 (0.0)	4 (0.0)	152 (0.3)
Hepatitis B, infectious	13 (0.2)	22 (0.6)	32 (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: Available 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, 2019

	Women	Heterosexual men	MSM
Laboratory-confirmed diagnoses			
Syphilis, non-infectious or not specified			
latens tarda	17 (0.1)	17 (0.1)	110 (0.2)
not specified	12 (0.0)	5 (0.0)	127 (0.2)
Hepatitis B, recovered	160 (2.8)	94 (2.7)	379 (4.1)
Hepatitis C	0 (0.0)	0 (0.0)	56 (0.9)
Any LGV			419
Rectal LGV			345
Urogenital LGV			5
Oral LGV			1
LGV ulcer			6
Other syndromes/ clinical diagnoses			
Trichomoniasis*	77	6	7
Genital herpes			
primary: HSV1**	59	24	39
primary: HSV2**	67	42	53
primary: HSV unknown	9	5	5
recurrent	4	2	8
Genital warts	342	374	212
Urethritis	2	459	362

Table 2.8b (continued) Number of other STI diagnoses and percentage of positive tests (in case of laboratory-confirmed diagnoses) by gender and type of sexual contact, 2019

	Women	Heterosexual men	MSM
Other syndromes/ clinical diagnoses			
Proctitis		0	97
Candidiasis	195	54	19
Bacterial vaginosis	487		
Scabies	1	7	7
Pubic Lice	0	0	4
PID	15		
Epididymitis		1	8
Mycoplasma genitalium	41	21	21
Ulcus e.c.i.	4	6	19

* Trichomoniasis tests are usually performed on clinical indication (e.g. women with bacterial vaginosis), and in persons notified for trichomoniasis.
** Laboratory-confirmed.
Footnote: Available aggregated data of non-registered consultations included for syphilis and any LGV.

2.3 Repeated testing at the Sexual Health Centres

Table 2.9 Number and percentage of unique clients visiting the SHCs repeatedly and the percentage of positive STI tests at each visit by gender and type of sexual contact, 2019

No. of consultation	Women		Heterosexual men		MSM	
	n (%)	% STI	n (%)	% STI	n (%)	% STI
1st	47,928 (100.0)	16.9	22,796 (100.0)	19.7	30,184 (100.0)	20.3
2nd	5,715 (11.9)	16.7	1,765 (7.7)	23.1	10,539 (34.9)	21.9
3rd	846 (1.8)	14.5	192 (0.8)	26.6	3,860 (12.8)	23.4
4th	154 (0.3)	10.4	24 (0.1)	33.3	1,462 (4.8)	26.9

Footnote: Number of visits reach up to 9 in MSM, 7 in women and 8 in heterosexual men. 5th-9th consultation not shown because of low numbers.

Table 2.10 Characteristics of unique clients at each consultation by gender and type of sexual contact, 2019

	Women n (%)	Heterosexual men n (%)	MSM n (%)
Notified for STI/HIV			
1st	7,437 (15.5)	6,024 (26.4)	5,332 (17.4)
2nd	810 (14.2)	520 (29.5)	1,765 (16.7)
3rd	86 (10.2)	44 (22.9)	645 (16.7)
STI-related symptoms			
1st	14,077 (29.4)	6,681 (29.3)	5,174 (17.1)
2nd	1,634 (28.6)	614 (34.8)	1,561 (14.8)
3rd	212 (25.1)	73 (38.0)	592 (15.3)
STI/HIV-endemic area			
1st	9,385 (19.6)	6,706 (29.4)	7,104 (23.5)
2nd	1,331 (23.3)	607 (34.4)	2,542 (24.1)
3rd	240 (28.4)	80 (41.7)	917 (23.8)
Age <25 years			
1st	36,085 (75.3)	15,220 (66.8)	5,332 (17.7)
2nd	4,101 (71.8)	1,261 (71.4)	1,453 (13.8)
3rd	523 (61.8)	143 (74.5)	422 (10.9)
Partner in risk group*			
1st	12,331 (25.7)	6,509 (28.6)	10,713 (35.5)
2nd	1,730 (30.3)	465 (26.3)	3,954 (37.5)
3rd	273 (32.3)	47 (24.5)	1,560 (40.4)
Sex worker			
1st	3,194 (6.7)	121 (0.5)	540 (1.8)
2nd	977 (17.1)	28 (1.6)	210 (2.0)
3rd	281 (33.2)	4 (2.1)	90 (2.3)
Gonorrhoea/chlamydia/syphilis in past year			
1st	4,425 (9.2)	1,558 (6.8)	5,950 (19.7)
2nd	1,554 (27.2)	549 (31.1)	3,801 (36.1)
3rd	338 (40.0)	97 (50.5)	1,867 (48.4)

Table 2.10 (continued) Characteristics of unique clients at each consultation by gender and type of sexual contact, 2019

	Women n (%)	Heterosexual men n (%)	MSM n (%)
≥3 sexual contacts in the past 6 months			
1st	20,866 (43.5)	13,503 (59.2)	23,461 (77.7)
2nd	2,882 (50.4)	1,200 (68.0)	8,764 (83.2)
3rd	425 (50.2)	137 (71.4)	3,313 (85.8)
Client of sex worker			
1st	97 (0.2)	1,384 (6.1)	825 (2.7)
2nd	21 (0.4)	99 (5.6)	213 (2.0)
3rd	4 (0.5)	4 (2.1)	73 (1.9)
Known HIV-positive			
1st	23 (0.0)	11 (0.0)	2,609 (8.6)
2nd	4 (0.1)	1 (0.1)	1,076 (10.2)
3rd	0 (0.0)	1 (0.5)	411 (10.6)
Low level of education**			
1st	3,382 (7.1)	2,017 (8.8)	2,476 (8.2)
2nd	500 (8.7)	153 (8.7)	848 (8.0)
3rd	88 (10.4)	18 (9.4)	285 (7.4)

Footnote: Number of visits reach up to 9 in MSM, 7 in women and 8 in heterosexual men. 4th-9th consultation not shown because of low numbers.

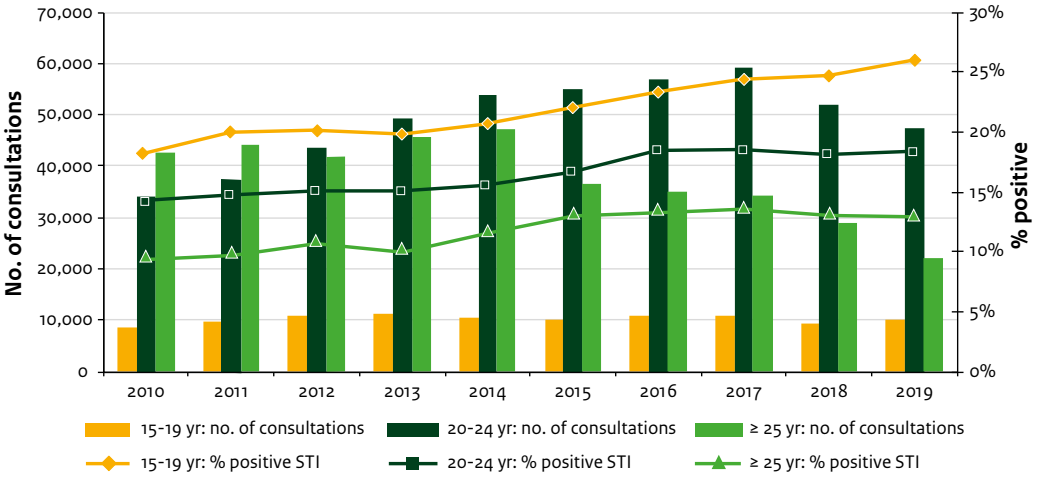
* For heterosexual men and MSM: partner originating from a high STI/HIV endemic country. For women: partner originating from an high STI/HIV endemic country or a male partner who had sex with men.

** Low level of education: no education, elementary school, lbo, mavo, vmbo, mbo-1.

2.4 Trends in Sexual Health Centre consultations

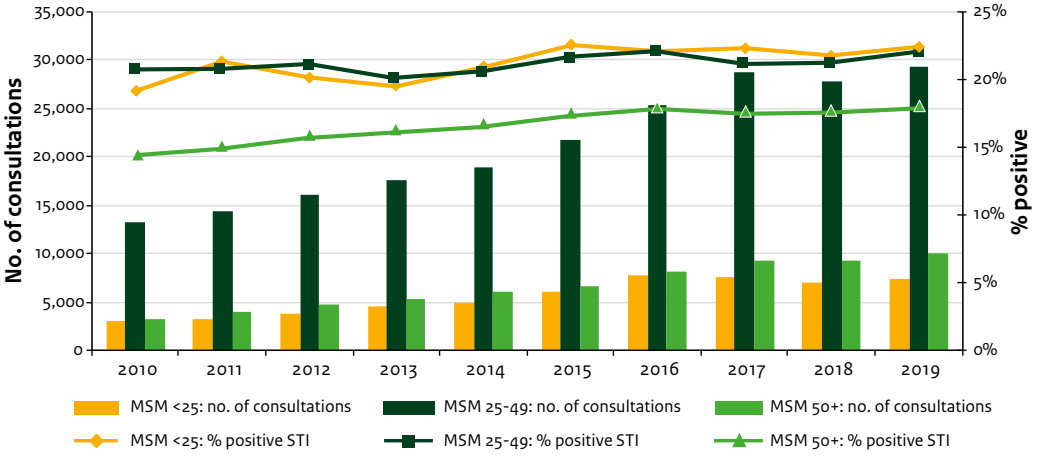
2.4.1 Trends in specific risk groups

Figure 2.6 Number of consultations and percentage of positive STI tests among women and heterosexual men by age group, 2010–2019



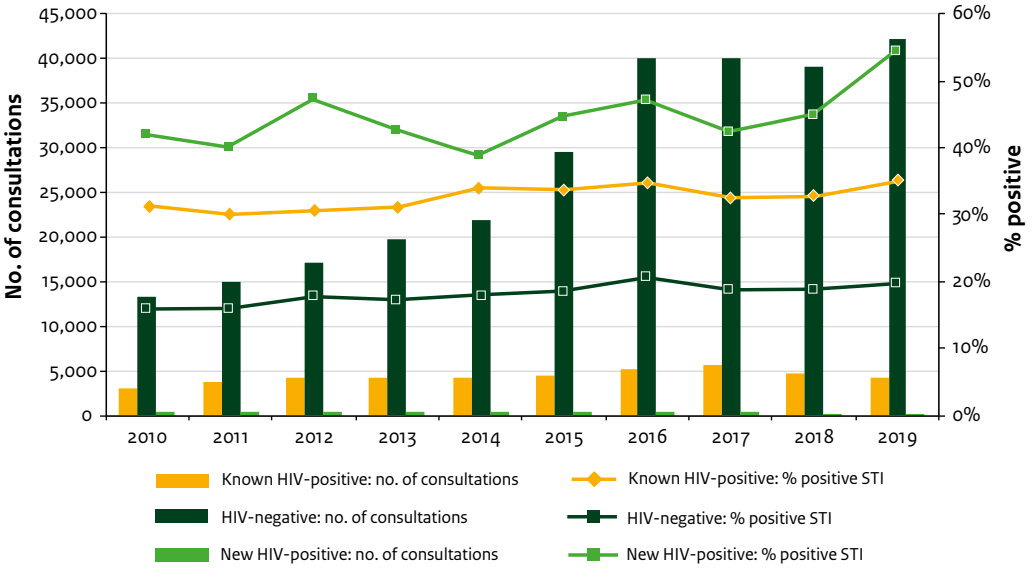
Footnote: STI includes chlamydia, gonorrhoea, infectious syphilis, HIV and infectious hepatitis B.

Figure 2.7 Number of consultations and percentage of positive STI tests among MSM by age group, 2010-2019



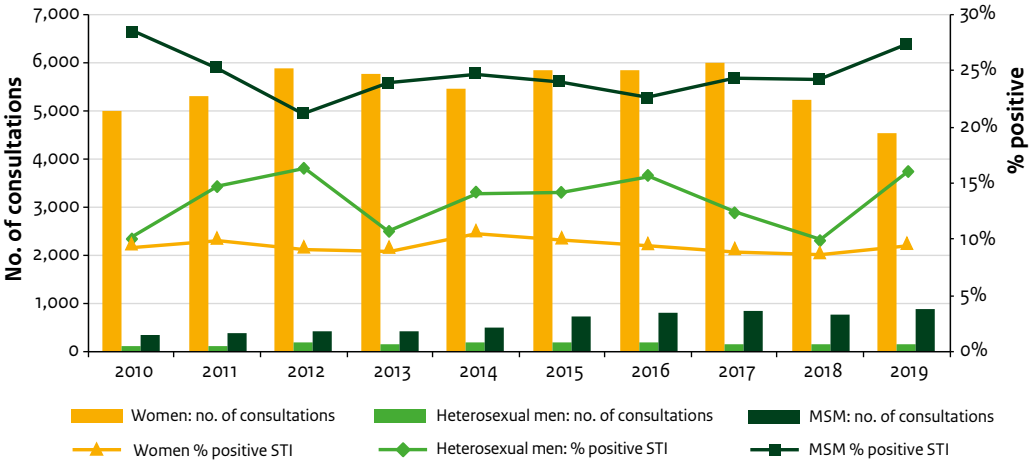
Footnote: STI includes: chlamydia, gonorrhoea, infectious syphilis, HIV and infectious hepatitis B.

Figure 2.8 Number of consultations and percentage of positive STI tests among MSM by HIV status, 2010-2019



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

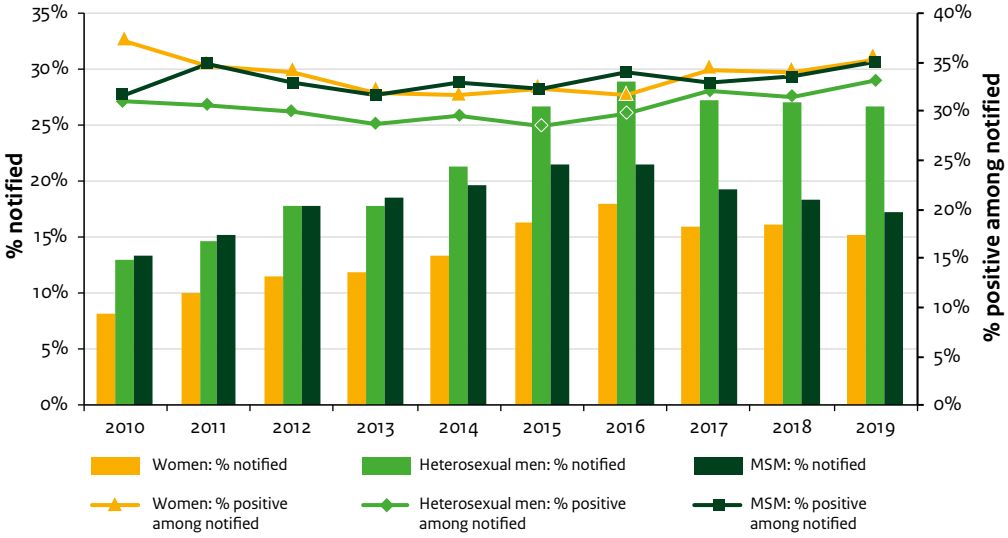
Figure 2.9 Number of consultations and percentage of positive STI tests among sex workers by gender and type of sexual contact, 2010-2019



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

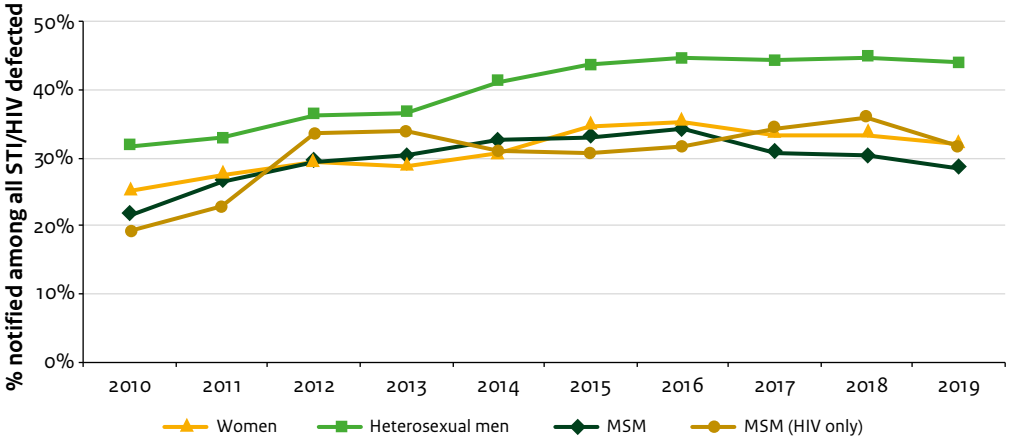
2.4.2 Partner notification trends

Figure 2.10 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, 2010-2019



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

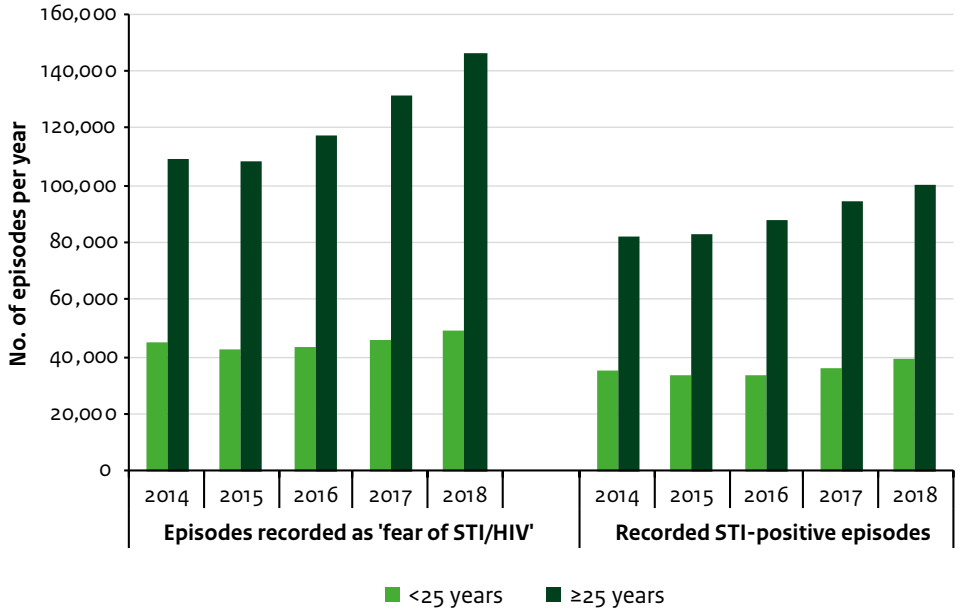
Figure 2.11 Percentage of STI detected through partner notification among heterosexual men, MSM and women, and percentage of HIV detected through partner notification among MSM, 2010-2019



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

2.5 General practice

Figure 2.12 Estimated annual number of recorded episodes of fear of STI/HIV and positive STI diagnoses in general practice by age-group, based on extrapolation from GP practices in Nivel-PCD, 2014-2018



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, 2014-2018

	Women n/1,000			Men n/1,000			Total n/1,000		
	All	**<25**	**≥25**	**All**	**<25**	**≥25**	**All**	**<25**	**≥25**
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
2018	**20.6**	22.8	19.7	**18.4**	13.7	20.3	**19.5**	18.3	20.0

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

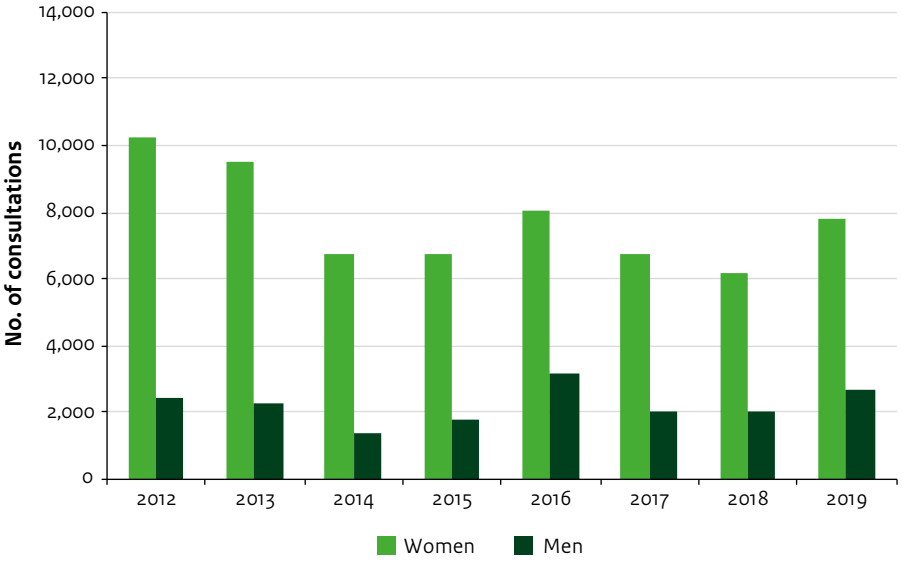
2.6 Sense

Table 2.12 Number of Sense consultations by age and gender, 2019

Age (years)	Women n (%)	Men n (%)
≤ 14	1,825 (23.5)	381 (14.4)
15-19	4,617 (59.4)	1,614 (60.8)
20-24	831 (10.7)	318 (12.0)
≥ 25	498 (6.4)	341 (12.8)
Total	**7,771**	**2,654**

Footnote: Transgenders (n=52) were excluded from the analyses.

Figure 2.13 Number of Sense consultations by gender, 2012-2019



Footnote: Transgenders (n=52) were excluded from the analyses.

Table 2.13 Number of Sense consultations by ethnicity and gender, 2019

Ethnicity	Women n (%)	Men n (%)
The Netherlands	4,569 (58.8)	1,392 (52.4)
Netherlands Antilles	357 (4.6)	134 (5.0)
Suriname	435 (5.6)	191 (7.2)
North Africa/Morocco	211 (2.7)	123 (4.6)
Turkey	175 (2.3)	98 (3.7)
Eastern Europe	435 (5.6)	89 (3.4)
Sub-Saharan Africa	348 (4.5)	124 (4.7)
Latin America	241 (3.1)	105 (4.0)
Asia	413 (5.3)	183 (6.9)
Europe other	463 (6.0)	179 (6.7)
Else	124 (1.6)	36 (1.4)
Total	**7,771**	**2,654**

Footnote: Transgenders (n=52) were excluded from the analyses.

Table 2.14 Subjects discussed during Sense consultations by gender, 2019

Subjects	Women n (%)	Men n (%)
STI	271 (3.2)	214 (7.9)
Sexuality	3,287 (39.0)	2,179 (80.0)
Birth control	3,301 (39.2)	20 (0.7)
Unwanted sexual behaviour/sexual violence	593 (7.0)	85 (3.1)
Unintended pregnancy	622 (7.4)	4 (0.1)
Else	350 (4.2)	223 (8.2)
Total	**8,424**	**2,725**

Footnote: Transgenders (n=52) were excluded from analyses. Numbers do not add up to total number of consultations, as for some consultations multiple topics were registered.

Table 2.15 Sexuality topics discussed during Sense consultations by gender, 2019

Questions/problems related to:	Women n (%)	Men n (%)
Human body	152 (4.6)	57 (2.6)
Sexual dysfunction	850 (25.5)	397 (18.0)
Sexual orientation	24 (0.7)	112 (5.1)
Gender identity	3 (0.1)	9 (0.4)
Sexual behaviour/sex techniques	1,772 (53.3)	1,182 (53.6)
Unknown/other	526 (15.8)	448 (20.3)
Total	**3,327**	**2,205**

Footnote: Transgenders (n=52) were excluded from analyses. Numbers do not add up to total number of sexuality topics in Table 2.14, as for some consultations multiple sexuality topics were registered.

2.7 Sexual Health in the Health Survey

Table 2.16 Characteristics of respondents to the national Health Survey 2018, by gender and sexual orientation

	Women	Heterosexual men	Men attracted to men*
	n %	n %	n %
Total	**4,202 (52.4)**	**3,645 (45.5)**	**168 (2.1)**
Age group			
16-29 years	748 (17.8)	564 (15.5)	
30-44 years	972 (23.1)	829 (22.7)	
45-59 years	1,169 (27.8)	1,056 (29.0)	
60 years and older	1,313 (31.2)	1,196 (32.8)	
Migration background			
Dutch	3,480 (82.8)	3,074 (84.3)	
Non-Dutch Western	352 (8.4)	308 (8.4)	
Non-Dutch non-Western	370 (8.8)	263 (7.2)	
Urbanisation			
(Highly) urbanized areas	2,163 (51.5)	1,887 (51.8)	
Moderately urbanized area	694 (16.5)	588 (16.1)	
Less/non-urbanized areas	1,345 (32.0)	1,170 (32.1)	

Source: Health Survey/Lifestyle Monitor, CBS in collaboration with RIVM, Rutgers and Soa Aids Nederland, 2018

* 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≤50).

Table 2.17 Weighted prevalence of sexual behaviour characteristics of respondents to the national Health Survey 2018, by age, gender and sexual orientation

	Women	Heterosexual men	Men attracted to men*
	%	%	%
Two or more sex partners in the past 12 months	**5.3**	**7.5**	**21.2**
16-29 years	13.4	18.5	
30-44 years	5.6	7.1	
45-59 years	2.6	4.6	
60 years and older	0.8	1.3	
Last sexual contact with a casual partner	**3.6**	**5.7**	**13.8**
16-29 years	10.1	14.4	
30-44 years	3.9	5.8	
45-59 years	1.7	3.3	
60 years and older	0.5	1.3	
Last sexual contact with a steady partner	**55.3**	**63.7**	**47.9**
16-29 years	56.5	46.9	
30-44 years	79.4	79.3	
45-59 years	65.4	76.0	
60 years and older	28.9	52.3	
Condom use at last sexual contact if contact was casual**	**45.0**	**57.4**	
16-29 years	43.2	60.3	
30 years and older	47.6	53.8	

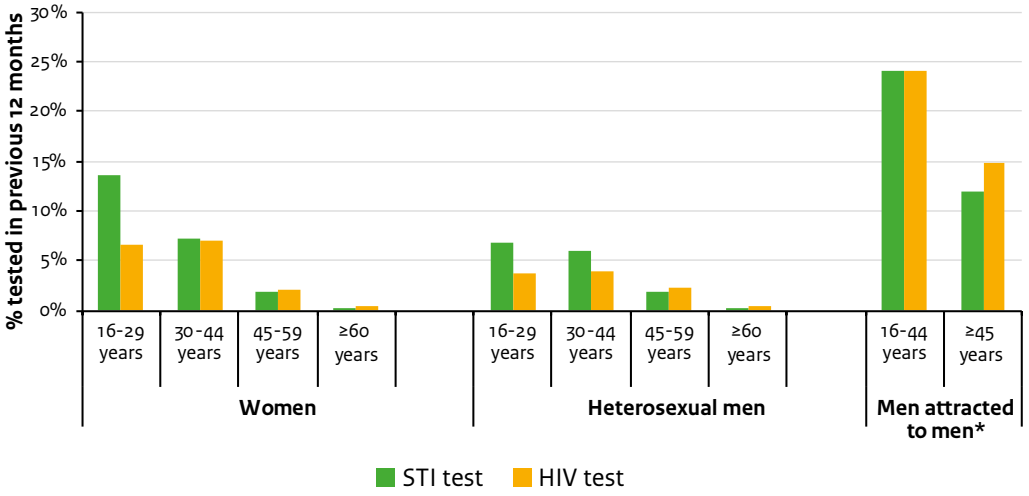
Source: Health Survey/Lifestyle Monitor, CBS in collaboration with RIVM, Rutgers and Soa Aids Nederland, 2018

* 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≤50).

** Fewer subcategories are shown for the characteristic 'Condom use at last sexual contact if contact was casual' due to low numbers (50≥n≤100). Women 16-29 years: n=88, 43.2% (95% confidence interval (CI) 32.7-54.2%). Women 30 years and older: n=63, 47.6% (95% CI 34.9-60.6%). Heterosexual men 30 years and older: n=93, 53.8% (95% CI 43.1-64.2%).

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

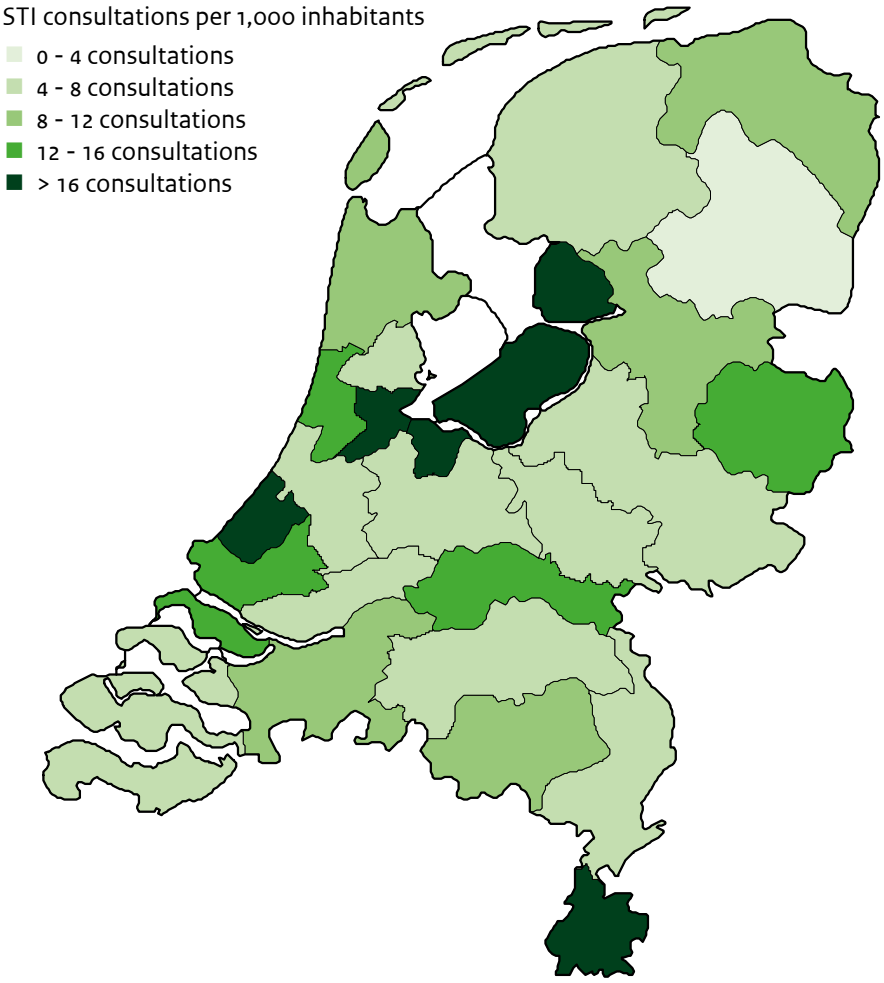
Figure 2.14 Weighted percentage tested for STI and HIV in the previous year in the Health Survey 2018, by age group, gender and sexual preference



Source: Health Survey/Lifestyle Monitor, CBS in collaboration with RIVM, Rutgers and Soa Aids Nederland, 2018
*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 (50≥ n≤100). 16-44 years: n=90, STI test and HIV test: 24.1% (95% confidence interval (CI) 16.5–34.0%), 45 year and older N=90, STI test: 12.0% (95%CI 6.8-20.6), HIV test: 14.8% (95%CI 8.6-23.5%).
Footnote: Respondents were weighted for demographic characteristics to correct for differences between the sample and the Dutch population.

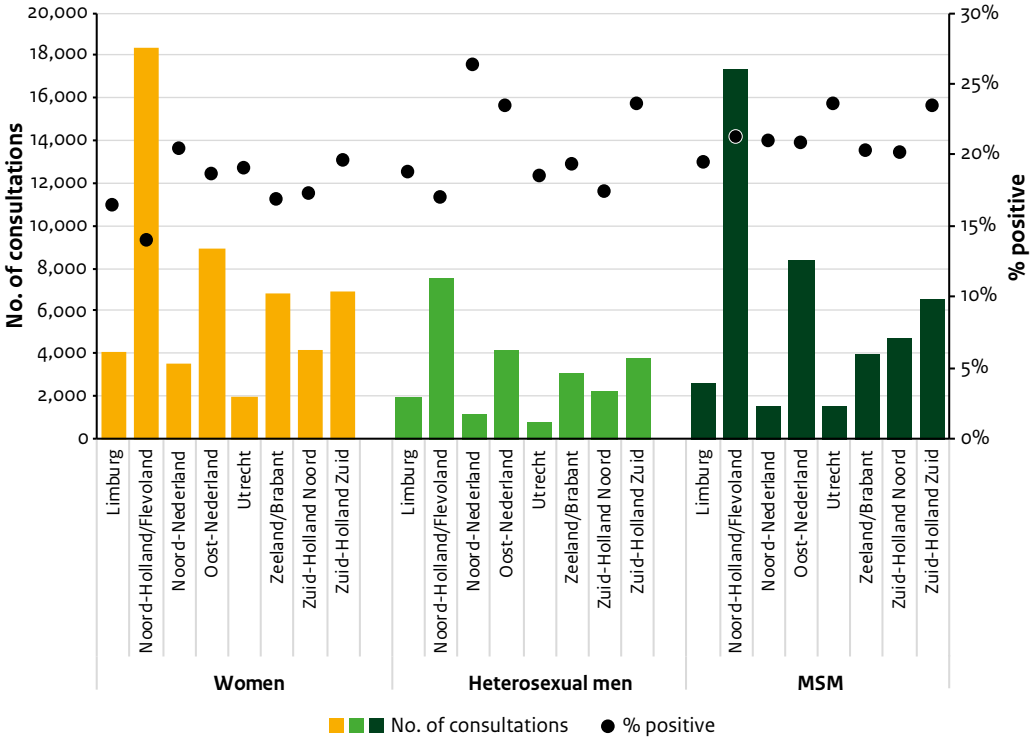
2.8 Consultations and characteristics of Sexual Health Centre attendees by region

Figure 2.15 Number of persons with at least one SHC consultation per 1,000 inhabitants of 15-65 years of age by region, 2019



Footnote 1: GGD Amsterdam = 66.6 per 1,000 inhabitants
Footnote 2: Aggregated data of non-registered consultations included.

Figure 2.16 Number of consultations and percentage of positive STI tests by region, gender and type of sexual contact, 2019



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

Figure 2.17 Distribution of age and type of sexual contact of all SHC consultations by region, 2019

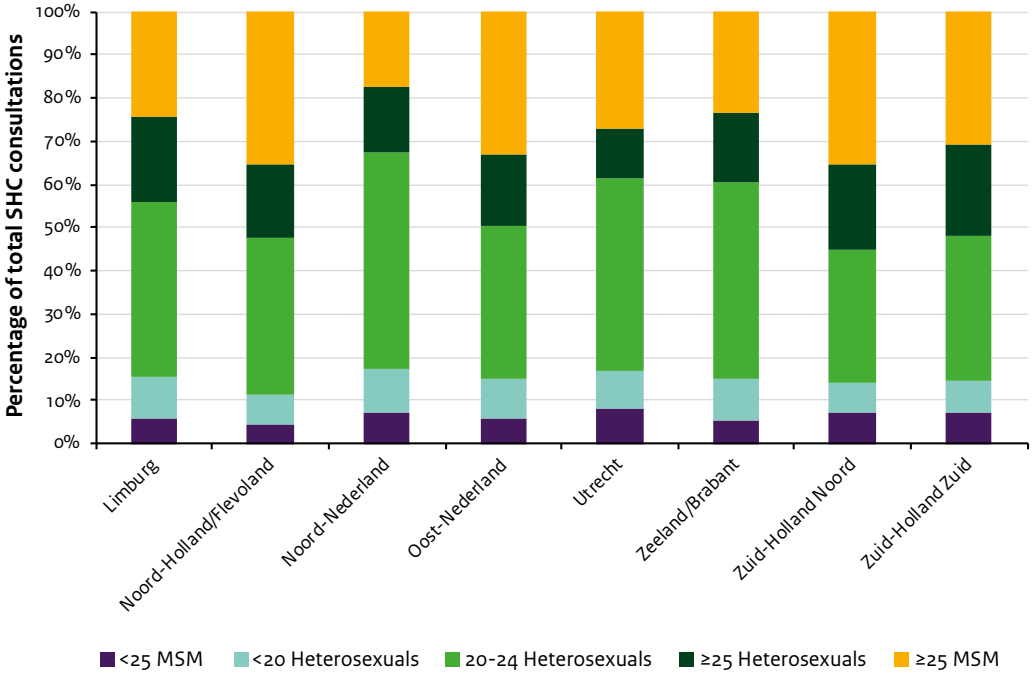


Figure 2.18 Distribution of consultations among notified clients and/or consultations among clients with symptoms of all SHC consultations among heterosexuals ≥ 25 years by region, 2019

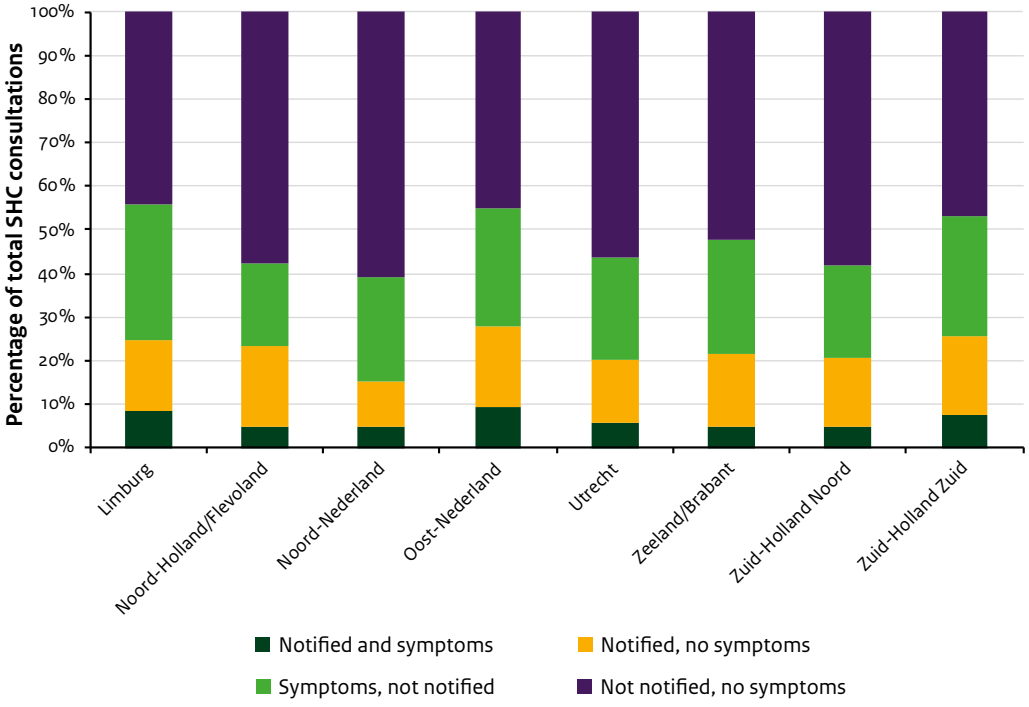
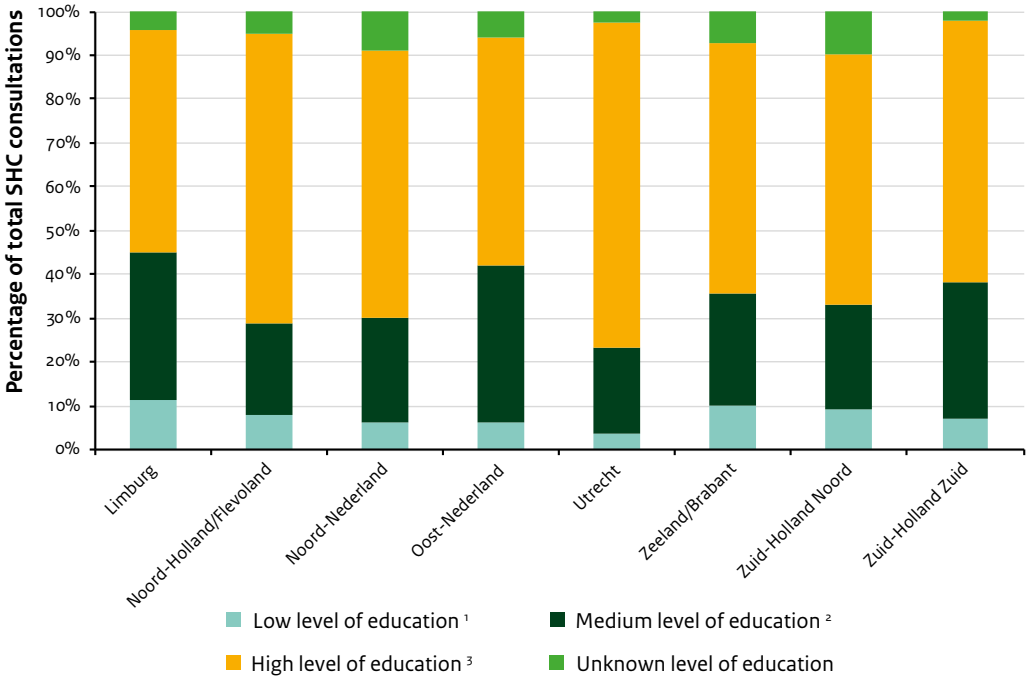


Figure 2.19 Distribution of level of education of all SHC consultations by region, 2019



1 No education, elementary school, lbo, mavo, vmbo, mbo-1.
2 Havo, VWO, MBO 2-4 .
3 University of applied sciences, university

2.9 PrEP consultations at Sexual Health Centres

Table 2.18 Characteristics of individuals at first PrEP consultation in the national PrEP pilot at the Sexual Health Centres, July-December 2019

	n individuals	%
Total number of individuals with a first PrEP consultation	2,797	100
Number of individuals with n PrEP consultation		
2nd consultation	846	30.2
3th consultation	51	1.8
4th consultation	2	0.1

Table 2.18 (continued) Characteristics of individuals at first PrEP consultation in the national PrEP pilot at the Sexual Health Centres, July-December 2019

	n individuals	%
Sex and sexual contact		
Men who have sex with men	2,739	97.9
Women	5	0.2
Men who have sex exclusively with women	0	0.0
Transgender	53	1.9
Median age at first consultation (IQR)	37 (28 - 48)	
Migratory background at first PrEP consultation		
Dutch	1,707	61.0
Other Western	459	16.4
First generation non-Western	472	16.9
Second generation non-Western	158	5.6
Unknown	1	0.0
Educational level at first PrEP consultation[1]		
High	1,685	60.2
Medium	589	21.1
Low	244	8.7
Unknown	279	10.0
Previously tested for HIV at first PrEP consultation		
No	86	3.1
Yes	2,705	96.7
Unknown	6	0.2
Type of first consultation		
Start consultation	1,821	65.1
3-monthly follow-up consultation[2]	976	34.9
PrEP indications at start consultation, all in the preceding 6 months[3]		
Rectal STI diagnosis	485	17.3
Condomless anal sex with partner with unknown HIV-status	1,493	53.4
Use of post-exposure prophylaxis (PEP)	80	2.9
Other[4]	242	8.7
Missing for 3-monthly follow-up consultations	976	34.9

Table 2.18 (continued) Characteristics of individuals at first PrEP consultation in the national PrEP pilot at the Sexual Health Centres, July-December 2019

	n individuals	%
PrEP use in the past year at first PrEP consultation		
No	1,120	40.0
Yes, most recent use 4-12 months ago	115	4.1
Yes, in the past 3 months	1,562	55.8
Previous PrEP prescriber at first PrEP consultation[5]		
Clinician at SHC	303	18.1
Clinician at SHC as part of PrEP study	219	13.1
General practitioner	286	17.1
HIV clinician	16	1.0
Other physician	28	1.7
Informal routes	55	3.3
Other	38	2.3
Missing	970	57.8
Number of persons who discontinued PrEP at first consultation or follow-up [6,7]	27	1.0

[1] Low: no education, elementary school, lbo, mavo, vmbo, mbo-1; medium: mbo-2-4, havo, vwo; high: university of applied sciences, university.

[2] Includes persons who started using PrEP via SHC, study, or other health care providers before the start of the national PrEP pilot at the 1st of July 2019. Of these consultations, 528 were performed between July-September and 448 between October-December.

[3] PrEP indications are registered for start consultations only. An individual can have more than one indication for PrEP, therefore the total PrEP indications can be higher than the number start consultations.

[4] Main other reasons included fear for HIV, did not want to go to GP or the GP does not prescribe PrEP, financial reasons, vulnerable (including migrants, MSM younger than 25 years of age, sex work or transgender persons) and client wants optimal protection against HIV.

[5] Percentage was calculated among those who used PrEP in the past year (n=1,677).

[6] Includes only those registered as having discontinued PrEP. Follow-up time was too short to identify loss to follow-up (no-show for more than 6 months after the last PrEP consultation).

[7] Almost 50% reported to discontinue using PrEP because of lower levels of sexual risk behaviour (n=13).

Table 2.19 Characteristics of PrEP consultations among persons participating in the national PrEP pilot at the Sexual Health Centres, July-December 2019

	n consultations	%
Consultations since participation in the PrEP pilot		
Total	3,974	100
Start consultations followed by a check-up after one month[1]	606	15.2
Start consultations without a 1-month check-up[1, 2]	1,253	31.5
3-monthly follow-up consultations	1,837	46.2
Additional STI consultations in between PrEP consultations	248	6.2
Additional Testlab consultations in between PrEP consultations	30	0.8
Median time in weeks (IQR) between PrEP follow-up consultations[3]	13 (12 - 14)	
PrEP use in the past 3 months at follow-up consultations[4]		
Daily	1,046	56.9
Event-Driven	708	38.5
Both	57	3.1
Missing	26	1.4
Number of pills provided at follow-up consultations[4]		
0	415	22.6
30	174	9.5
60	310	16.9
90	872	47.5
Other	66	3.6

[1] Due to registration of multiple start consultations for some individuals or registration of start consultations after a first follow-up consultation, the total number of start consultations is higher than at first PrEP consultation in Table 2.18.
[2] One month follow-up consultations might not be carried out for clients who were using PrEP in the 3 months prior to the start consultation.
[3] Calculated among 390 persons with more than 1 follow-up consultation.
[4] Percentage calculated using the number of 3-monthly follow-up consultations as denominator (n=1,837).

Table 2.20 Number of consultations, demographics and behavioural characteristics among HIV-negative MSM by PrEP use and PrEP provider, January-December 2019

	PrEP use				No PrEP use in the past 3 months	
	via SHC PrEP pilot[1]		via SHC before start pilot / via other health care providers[2]			
	n	%	n	%	n	%
Total number of MSM consultations[3]	3,887	100	5,829	100	32,647	100
Median age (IQR)	38 (29 - 48)		40 (31 - 49)		32 (26 - 45)	
Migratory background						
Dutch	2,430	62.5	3,887	66.7	22,092	67.7
Other Western	626	16.1	990	17.0	4,739	14.5
First-generation non-Western	619	15.9	704	12.1	3,688	11.3
Second-generation non-Western	211	5.4	247	4.2	2,114	6.5
Unknown	1	0.0	1	0.0	14	0.0
Educational level[4]						
High	2,396	61.6	4,070	69.8	20,589	63.1
Medium	817	21.0	1,035	17.8	7,386	22.6
Low	335	8.6	369	6.3	2,568	7.9
Unknown	339	8.7	355	6.1	2,104	6.4
Partner originating from a high STI/HIV endemic area, in the past 6 months						
No	2,045	52.6	3,268	56.1	20,761	63.6
Yes	1,774	45.6	2,467	42.3	11,274	34.5
Unknown	68	1.7	94	1.6	612	1.9
Reported sex work, in the past 6 months						
No	3,670	94.4	5,664	97.2	31,951	97.9
Yes, in past 6 months	127	3.3	106	1.8	578	1.8
Unknown	90	2.3	59	1.0	118	0.4
Chlamydia/gonorrhoea/syphilis, in past year						
Not tested	463	11.9	360	6.2	12,342	37.8
Tested, negative	1,420	36.5	2,300	39.5	13,405	41.1
Tested, positive	1,750	45.0	2,987	51.2	6,111	18.7

Table 2.20 (continued) Number of consultations, demographics and behavioural characteristics among HIV-negative MSM by PrEP use and PrEP provider, January-December 2019

	PrEP use				No PrEP use in the past 3 months	
	via SHC PrEP pilot[1]		via SHC before start pilot / via other health care providers[2]			
	n	%	n	%	n	%
Tested, unknown	54	1.4	68	1.2	153	0.5
Unknown	200	5.1	114	2.0	636	1.9
Number of partners, in past 6 months						
0-1	334	8.6	215	3.7	3,312	10.1
2-5	1,121	28.8	1,562	26.8	15,282	46.8
6-9	567	14.6	907	15.6	5,371	16.5
≥10	1,828	47.0	3,039	52.1	8,318	25.5
Unknown	37	1.0	106	1.8	364	1.1
Notified for STI/HIV						
No	3,498	90.0	4,702	80.7	27,367	83.8
Yes	385	9.9	1,120	19.2	5,255	16.1
Unknown	4	0.1	7	0.1	25	0.1
STI symptoms						
No	3,545	91.2	4,945	84.8	27,238	83.4
Yes	330	8.5	877	15.0	5,351	16.4
Unknown	12	0.3	7	0.1	58	0.2
Receptive anal sex, in past 6 months						
No receptive anal sex	602	15.5	856	14.7	9,897	30.3
Yes, consistently with a condom	297	7.6	426	7.3	6,861	21.0
Yes, not consistently with a condom	2,896	74.5	4,499	77.2	15,469	47.4
Unknown	92	2.4	48	0.8	420	1.3
Insertive anal sex, in past 6 months						
No insertive anal sex	504	13.0	620	10.6	7,244	22.2
Yes, consistently with a condom	303	7.8	429	7.4	7,624	23.4
Yes, not consistently with a condom	2,985	76.8	4,735	81.2	17,419	53.4
Unknown	95	2.4	45	0.8	360	1.1

Table 2.20 (continued) Number of consultations, demographics and behavioural characteristics among HIV-negative MSM by PrEP use and PrEP provider, January-December 2019

	PrEP use				No PrEP use in the past 3 months	
	via SHC PrEP pilot[1]		via SHC before start pilot / via other health care providers[2]			
	n	%	n	%	n	%
Group sex, in the past 6 months						
No	1,249	32.1	2,167	37.2	22,213	68.0
Yes	1,218	31.3	2,684	46.0	8,294	25.4
Unknown	1,420	36.5	987	16.9	2,140	6.6
Drug use in the context of sex, in past 6 months						
No	2,233	57.4	2,985	51.2	25,686	78.7
Yes	1,645	42.3	2,844	48.8	6,961	21.3
Unknown		0.0		0.0		0.0
Chlamydia[5]						
Negative	3,217	88.3	4,972	85.6	29,587	90.9
Positive	426	11.7	840	14.4	2,953	9.1
Gonorrhoea[5]						
Negative	3,215	88.2	4,809	82.8	29,503	90.6
Positive	432	11.8	1,002	17.2	3,060	9.4
Infectious syphilis (primary, secondary and early latent)[5]						
Negative	3,659	97.7	5,555	96.5	31,846	98.3
Positive	86	2.3	204	3.5	549	1.7

[1] All STI clinic visits since first PrEP consultation at the SHC, including additional STI consultations in between PrEP consultations.
[2] All STI clinic visits among PrEP users via SHC before the start of the pilot or via other health care providers between January-December 2019.
[3] The total number of consultations among PrEP users via SHC pilot includes MSM only and therefore differs from the number of consultations reported in Table 2.19 which also includes consultations among transgenders and women.
[4] Low: no education, elementary school, lbo, mavo, vmbo, mbo-1; medium: mbo-2-4, havo, vwo; high: university of applied sciences, university.
[5] Excluding those not tested. Therefore, numbers may not add up to the total number of consultations.

BACTERIAL STI

3 Chlamydia, including Lymphogranuloma venereum

3.1 Key points

3.1.1 Sexual Health Centres

- In total, 21,134 chlamydia infections were diagnosed at SHCs in 2019, which was similar to 2018 (n=21,021).
- Among women, heterosexual men, and MSM the positivity rate has remained stable in the past three years; 15% among women, 18% among heterosexual men and around 10% among MSM. Of all diagnoses, 3,024 (14.3%) were not registered in the national database. The following key points are based on registered consultations only.

- The highest positivity rates were found in persons notified for chlamydia (36.5% in women, 35.8% in heterosexual men and 25.1% in MSM).
- High positivity rates were also seen among heterosexual adolescents (24.6% among girls and 25.1% among boys aged under 19 years). Other groups with high positivity rates were women and heterosexual men of Antillean/Aruban origin (18.7% among women, 23.9% among heterosexual men), heterosexual men with symptoms (27.1%) or an STI history in the past year (23.8%).
- Almost 25% of MSM with chlamydia were co-infected with gonorrhoea, 4.8% with syphilis and 0.9% were newly diagnosed with HIV.
- The chlamydia positivity among MSM who used PrEP in the last three months was 13.9%, which was lower than the positivity among HIV-positive MSM (16.6%), but higher than HIV-negative MSM who did not use PrEP in the last three months (9.3%).

3.1.2 General practice

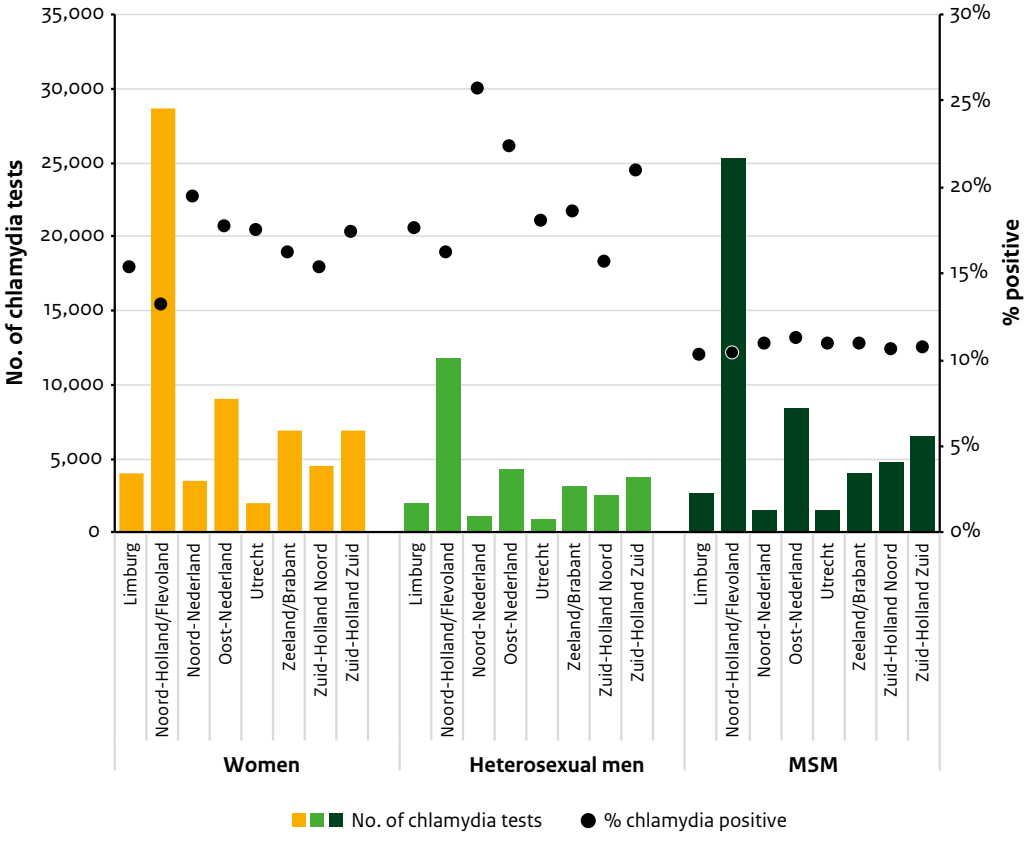
- An estimated 42,500 chlamydia infections were diagnosed in general practice in 2018, an increase compared with 39,800 estimated infections in 2017.
- In general practice, the estimated number of chlamydia episodes increased by 8% among men (to around 18,400 episodes in 2018) and by 5% among women (to around 24,100 episodes in 2018) compared with 2017.
- The annual reporting rate among women was higher among women under 25 (4.7 per 1,000) than it was among women aged 25 and older (2.1 per 1,000), as well as among men under 25 compared with men aged 25 and older (2.5 vs 2.0 per 1,000 respectively).

3.1.3 Lymphogranuloma venereum at Sexual Health Centres

- The number of LGV cases further increased by 34% to 419 in 2019 (non-registered consultations included). The percentage of HIV-negative MSM among LGV positives has continued to increase from 21% in 2013 to 60% in 2019. The rectal LGV positivity rate among HIV-positive MSM tested for rectal chlamydia fluctuated, but increased from 1.9% in 2010 to 3.1% in 2019. Among HIV-negative MSM, the LGV positivity rate was low over the full period, but slowly increased from 0.2% in 2010 to 0.5% in 2019.
- The percentage of asymptomatic rectal LGV increased from 33% in 2010 to 61% in 2019 (registered consultations only).

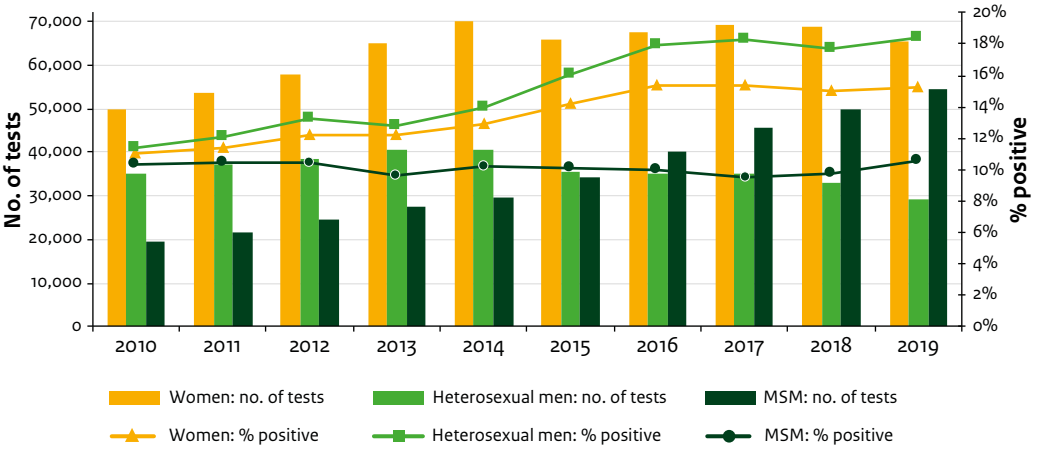
3.2 Sexual Health Centres: characteristics, risk groups and trends

Figure 3.1 Number of chlamydia tests and percentage of chlamydia positives by region, gender and type of sexual contact, 2019



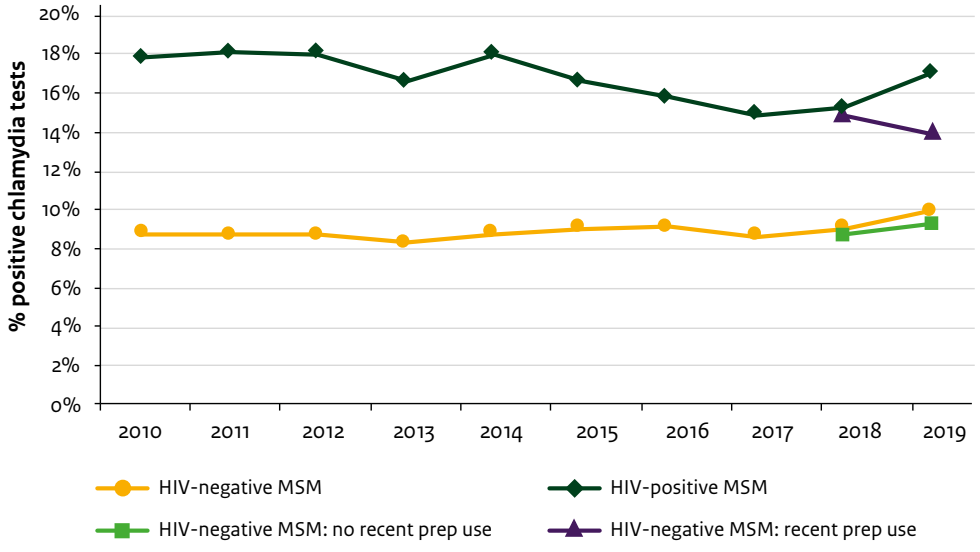
Footnote: Aggregated data of non-registered consultations included.

Figure 3.2 Total number of tests and positivity rate of chlamydia by gender and type of sexual contact, 2010–2019



Footnote: Aggregated data of non-registered consultations included.

Figure 3.3 Trends in positivity rate for chlamydia in MSM by HIV-status and PrEP use, 2010-2019



Footnote: Recent PrEP users includes PrEP users via the SHC pilot programme and via other health care providers. Information on PrEP use has been collected since 2018. In 2018, recent PrEP use was defined as use in the past 6 months. Since 2019, recent PrEP use has been defined as use in the past 3 months.

Table 3.1 Number of chlamydia diagnoses and persons tested for chlamydia by age, gender and type of sexual contact, 2019

Age (years)	Women		Heterosexual men		MSM	
	n positive/N	%	n positive/N	%	n positive/N	%
≤19	1,905/7,731	24.6	562/2,240	25.1	116/1,004	11.6
20–24	5,404/33,023	16.4	2,860/14,385	19.9	723/6,323	11.4
25–29	816/7,531	10.8	839/4,711	17.8	946/8,668	10.9
30–34	164/2,276	7.2	207/1,577	13.1	793/6,927	11.4
35–39	88/1,244	7.1	81/769	10.5	529/5,048	10.5
40–44	41/800	5.1	38/364	10.4	498/4,458	11.2
45–49	42/755	5.6	23/239	9.6	399/3,910	10.2
50–54	39/679	5.7	14/195	7.2	412/3,936	10.5
≥ 55	41/555	7.4	17/269	6.3	513/6,001	8.5
Total	**8,540/54,594**	**15.6**	**4,641/24,749**	**18.8**	**4,929/46,275**	**10.7**

Figure 3.4 Trends in positivity rate in women and heterosexual men by age-group, 2010–2019

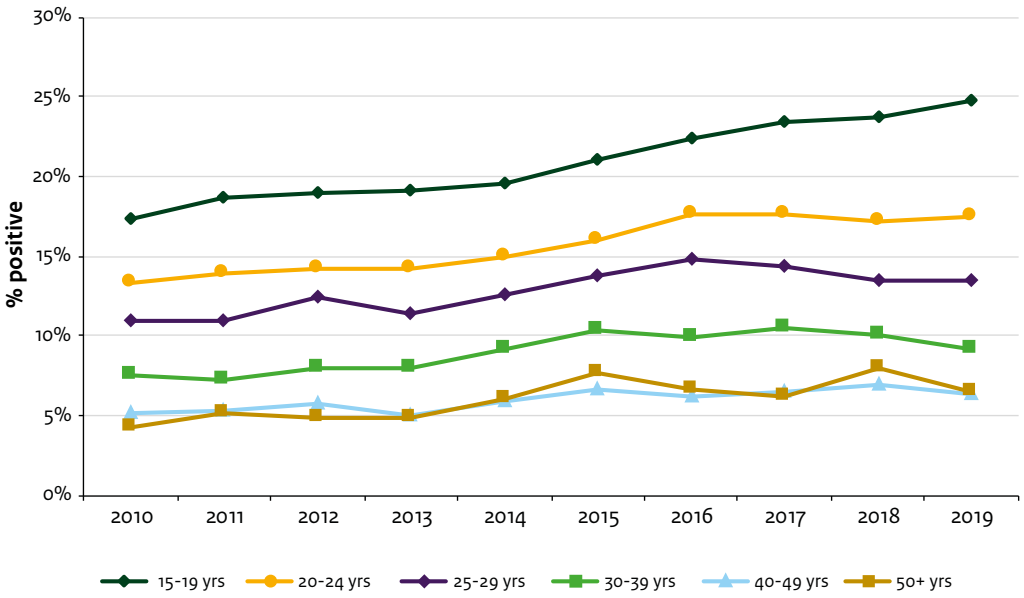


Table 3.2a Number of chlamydia diagnoses and persons tested for chlamydia by migration background, gender and type of sexual contact, 2019

Migration background	Women		Heterosexual men		MSM	
	n positive/N	%	n positive/N	%	n positive/N	%
Dutch	6,456/40,426	16.0	3,051/15,832	19.3	3,209/30,784	10.4
Other Western	685/5,538	12.4	332/2,173	15.3	720/6,992	10.3
First generation non-Western	370/3,044	12.2	409/2,507	16.3	673/5,739	11.7
Second generation non-Western	1,026/5,563	18.4	847/4,227	20.0	326/2,745	11.9
Non-Western, generation unknown	0/2	0.0	0/0	0.0	0/1	0.0
Unknown	3/21	14.3	2/10	20.0	1/14	7.1
Total	**8,540/54,594**	**15.6**	**4,641/24,749**	**18.8**	**4,929/46,275**	**10.7**

Table 3.2b Number of chlamydia diagnoses 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, 2019

Region of origin	Women		Heterosexual men		MSM	
	n positive/N	%	n positive/N	%	n positive/N	%
Turkey	112/584	19.2	108/738	14.6	82/778	10.5
North Africa/Morocco	155/818	18.9	162/964	16.8	92/748	12.3
Suriname	338/1,940	17.4	329/1,511	21.8	152/1,209	12.6
Netherlands Antilles/Aruba	246/1,318	18.7	245/1,024	23.9	122/1,019	12.0
Sub-Saharan Africa	172/1,137	15.1	203/1,025	19.8	62/646	9.6
Eastern Europe	179/1,865	9.6	62/422	14.7	170/1,491	11.4
Latin America	147/1,276	11.5	84/479	17.5	219/1,705	12.8
Asia	294/2,041	14.4	168/1,225	13.7	363/3,324	10.9
Total	**1,643/10,979**	**15.0**	**1,361/7,388**	**18.4**	**1,262/10,920**	**11.6**

Table 3.3a Number of chlamydia diagnoses and persons tested for chlamydia by triage indication, gender and type of sexual contact, 2019

	Women		Heterosexual men		MSM	
	n positive/N	%	n positive/N	%	n positive/N	%
Notified						
Not notified	5,756/45,902	12.5	2,517/18,073	13.9	3,497/38,257	9.1
Notified for chlamydia	2,445/6,695	36.5	1,946/5,436	35.8	833/3,319	25.1
Notified for other STI/HIV	99/736	13.5	57/546	10.4	524/4,244	12.3
Unknown	240/1,261	19.0	121/694	17.4	75/455	16.5
Symptoms						
No	5,436/38,380	14.2	2,629/17,293	15.2	3,628/38,566	9.4
Yes	3,048/15,948	19.1	1,997/7,360	27.1	1,290/7,634	16.9
Unknown	56/266	21.1	15/96	15.6	11/75	14.7
STI/HIV endemic area						
No	6,897/43,615	15.8	3,280/17,361	18.9	3,667/35,355	10.4
Yes	1,643/10,979	15.0	1,361/7,388	18.4	1,262/10,920	11.6
Age <25 years						
No	7,309/40,754	17.9	3,422/16,625	20.6	839/7,327	11.5
Yes	1,231/40,754	8.9	1,219/8,124	15.0	4,090/38,948	10.5
Partner in risk group*						
No	6,502/39,421	16.5	3,650/17,622	20.7	2,967/28,455	10.4
Yes	1,966/14,372	13.7	968/7,012	13.8	1,890/17,020	11.1
Unknown	72/801	9.0	23/115	20.0	72/800	9.0
Sex worker						
No	8,206/49,880	16.5	4,606/24,502	18.8	4,773/45,145	10.6
Yes, in past 6 months	310/4,545	6.8	21/154	13.6	119/877	13.6
Unknown	24/169	14.2	14/93	15.1	37/253	14.6
Gonorrhoea/chlamydia/syphilis in past year						
Not tested	5,538/33,719	16.4	3,414/18,423	18.5	1,308/13,790	9.5
Tested, negative	1,717/14,088	12.2	683/3,986	17.1	1,530/18,446	8.3
Tested, positive	1,240/6,393	19.4	528/2,220	23.8	1,960/12,777	15.3
Tested, unknown	10/76	13.2	1/13	7.7	26/303	8.6
Unknown	35/318	11.0	15/107	14.0	105/959	10.9

*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 chlamydia diagnoses and persons tested for chlamydia by demographics, (sexual) behavioural characteristics, gender and type of sexual contact, 2019

	Women		Heterosexual men		MSM	
	n positive/N	%	n positive/N	%	n positive/N	%
Educational level[1]						
High	4,532/32,252	14.1	2,353/13,862	17.0	2,969/29,226	10.2
Medium	3,048/15,390	19.8	1,741/7,885	22.1	1,227/10,199	12.0
Low	716/3,979	18.0	432/2,183	19.8	415/3,709	11.2
Unknown	244/2,973	8.2	115/819	14.0	318/3,141	10.1
Number of partners in past 6 months						
0 partners	53/569	9.3	26/202	12.9	40/579	6.9
1 partner	2,048/14,096	14.5	736/4,575	16.1	262/3,429	7.6
2 partners	2,211/13,889	15.9	935/5,053	18.5	369/4,551	8.1
3 or more partners	4,106/24,267	16.9	2,928/14,838	19.7	4,184/37,111	11.3
Unknown	122/1,773	6.9	16/81	19.8	74/605	12.2
Receptive anal sex, in past 6 months						
No receptive anal sex	6,736/42,784	15.7			777/11,722	6.6
Yes, consistently with a condom	138/1,349	10.2			586/7,875	7.4
Yes, not consistently with a condom	1,596/9,775	16.3			3,515/26,164	13.4
Unknown	70/686	10.2			51/514	9.9
Insertive anal sex, in past 6 months						
No insertive anal sex			3,788/20,042	18.9	720/8,905	8.1
Yes, consistently with a condom			57/456	12.5	640/8,622	7.4
Yes, not consistently with a condom			418/2,420	17.3	3,522/28,298	12.4
Unknown			378/1,831	20.6	47/450	10.4
Vaginal sex, in past 6 months[2]						
No vaginal sex	29/434	6.7	14/178	7.9	88/928	9.5
Yes, consistently with a condom	328/4,115	8.0	150/1,615	9.3	78/930	8.4
Yes, not consistently with a condom	8,115/49,430	16.4	4,430/22,646	19.6	407/4,425	9.2
Unknown	68/615	11.1	47/310	15.2	56/693	8.1

Table 3.3b (continued) Number of chlamydia diagnoses and persons tested for chlamydia by demographics, (sexual) behavioural characteristics, gender and type of sexual contact, 2019

	Women		Heterosexual men		MSM	
	n positive/N	%	n positive/N	%	n positive/N	%
Receptive oral sex, in past 6 months						
No receptive oral sex	978/6,089	16.1			161/2,021	8.0
Yes, consistently with a condom	69/1,188	5.8			23/374	6.1
Yes, not consistently with a condom	7,170/45,173	15.9			4,686/43,249	10.8
Unknown	323/2,144	15.1			59/631	9.4
Client of sex worker						
No	7,015/41,271	17.0	4,473/23,109	19.4	4,777/44,708	10.7
Yes, in past 6 months	8/125	6.4	144/1,482	9.7	92/1,129	8.1
Unknown	1,517/13,198	11.5	24/158	15.2	60/438	13.7
Previous HIV test						
No	6,806/39,151	17.4	3,642/18,259	19.9	469/4,727	9.9
Yes, positive	4/27	14.8	0/13	0.0	710/4,280	16.6
Yes, negative	1,616/14,586	11.1	933/6,034	15.5	3,729/37,044	10.1
Yes, result unknown	11/143	7.7	8/48	16.7	8/68	11.8
Unknown	103/687	15.0	58/395	14.7	13/156	8.3
Drug use, in past 6 months[3, 4]						
No					3,006/32,179	9.3
Yes, in past 6 months					1,849/13,368	13.8
Unknown					74/728	10.2
Group sex, in past 6 months[4]						
No					2,538/27,351	9.3
Yes, in past 6 months					1,940/14,089	13.8
Unknown					451/4,835	9.3
PrEP use, in past 3 months[4]						
No					3,290/35,321	9.3
Yes					929/6,674	13.9
Known HIV-infection, not eligible					710/4,280	16.6

1 Low level of education: no education, elementary school, lbo, mavo, vmbo, mbo-1; medium level of education: mbo2-4, havo, vwo; high level of education: university of applied sciences, university.

2 For MSM: numbers are reported for men who had sex with both men and women (N=6,976). Men who had sex with men only are excluded.

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

4 Data not obligatory to collect for heterosexual men and women; results are therefore not shown.

Table 3.4 Concurrent STI by gender and type of sexual contact among persons diagnosed with chlamydia, 2019

Concurrent infection	Women (N=8,540) n (%)	Heterosexual men (N=4,641) n (%)	MSM (N=4,929) n (%)
Gonorrhoea	422 (4.9)	229 (4.9)	1,226 (24.9)
Syphilis, infectious	3 (0.0)	2 (0.0)	235 (4.8)
HIV newly diagnosed	0 (0.0)	2 (0.0)	43 (0.9)
Genital herpes	10 (0.1)	5 (0.1)	13 (0.3)
Genital warts	46 (0.5)	61 (1.3)	23 (0.5)
Hepatitis B, infectious	1 (0.0)	6 (0.1)	4 (0.1)
Hepatitis C	0 (0.0)	0 (0.0)	13 (0.3)

Footnote: SHCs 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, 2019

Location	Women n positive (%)	Heterosexual men n positive (%)	MSM n positive (%)
Urogenital	8,043 (14.7)	4,637 (18.7)	1,529 (3.3)
Anorectal	2,645 (13.5)	11 (5.3)	3,758 (8.3)
Oral	531 (2.7)	4 (1.6)	543 (1.2)

Footnote 1: Heterosexual men are usually only tested urogenital, while women are tested on indication for anorectal or oral chlamydia; MSM are usually tested in all three locations.
Footnote 2: Please note that people can have positive tests at multiple locations.

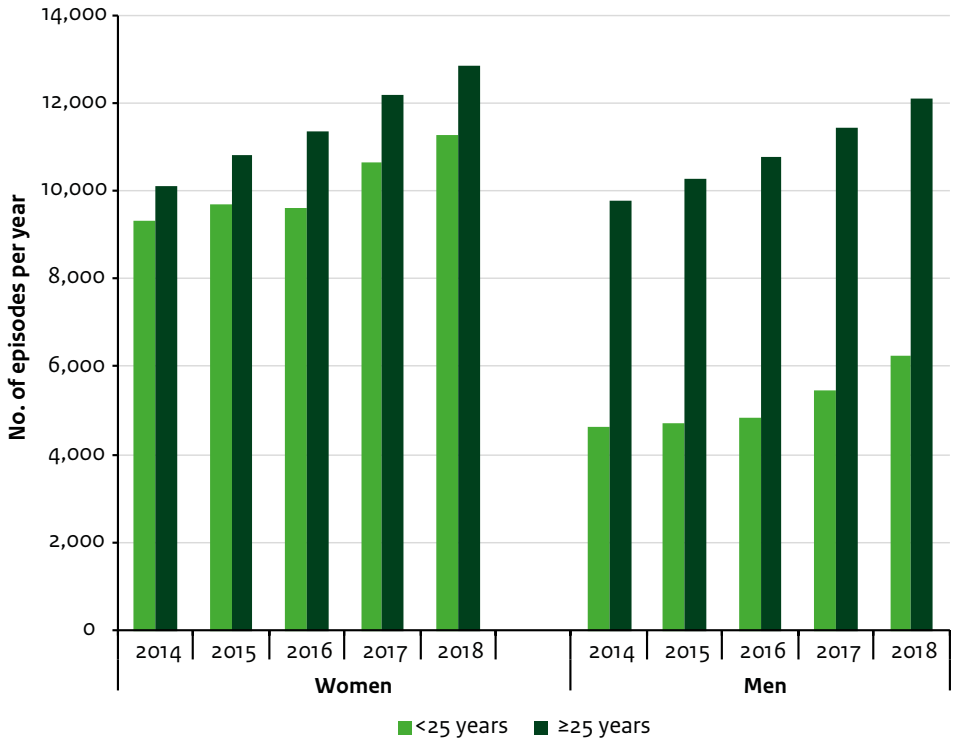
Table 3.6 Anatomic location of chlamydia infection by gender and type of sexual contact, 2019

Location	Women (N=8,539) n (%)	Heterosexual men (N=4,640) n (%)	MSM (N=4,927) n (%)
Urogenital only	5,581 (65.4)	4,628 (99.7)	958 (19.4)
Anorectal only	372 (4.4)	3 (0.1)	2,934 (59.5)
Oral only	108 (1.3)	0 (0.0)	190 (3.9)
Urogenital and anorectal	2,055 (24.1)	5 (0.0)	492 (10.0)
Urogenital and oral	205 (2.4)	1 (0.1)	21 (0.4)
Anorectal and oral	16 (0.2)	0 (0.0)	274 (5.6)
Urogenital and anorectal and oral	202 (2.4)	3 (0.1)	58 (1.2)

Footnote: Anatomical location of infection could not be determined for 1 woman, 1 hetersexual man and 2 MSM due to pooled samples.

3.3 General practice

Figure 3.5 Estimated annual number of reported episodes of chlamydia at GPs by gender and age group, based on extrapolation from GP practices in Nivel-PCD, 2014-2018



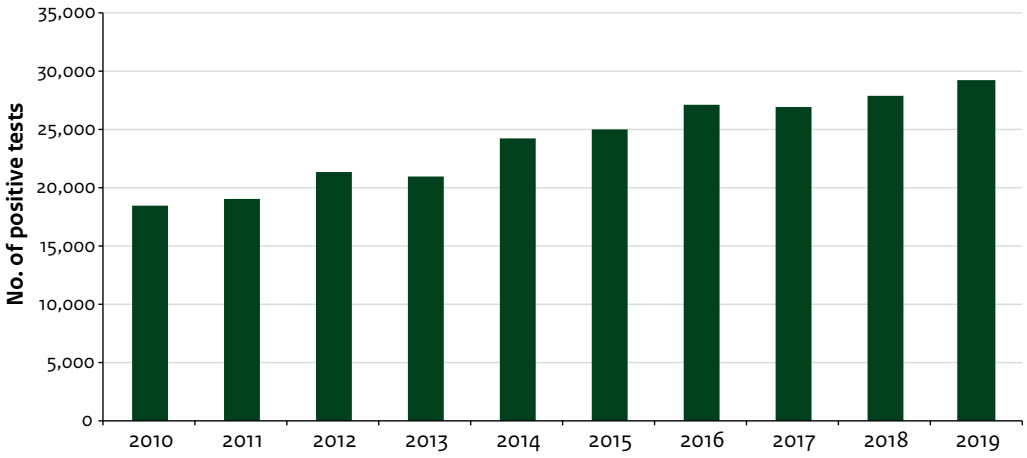
Footnote: About 70% of the total Dutch population consists of persons aged ≥25 years and about 30% consists of persons aged <25 years.

Table 3.7 Annual reporting rate (number of episodes per 1,000 persons) of chlamydia in general practice in the Netherlands by gender and age group, based on GP practices in Nivel-PCD, 2014-2018

	Women			Men			Total		
	n/1,000			n/1,000			n/1,000		
	All	**<25**	**≥25**	**All**	**<25**	**≥25**	**All**	**<25**	**≥25**
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
2018	**2.8**	4.7	2.1	**2.2**	2.5	2.0	**2.5**	3.6	2.0

3.4 Laboratory surveillance

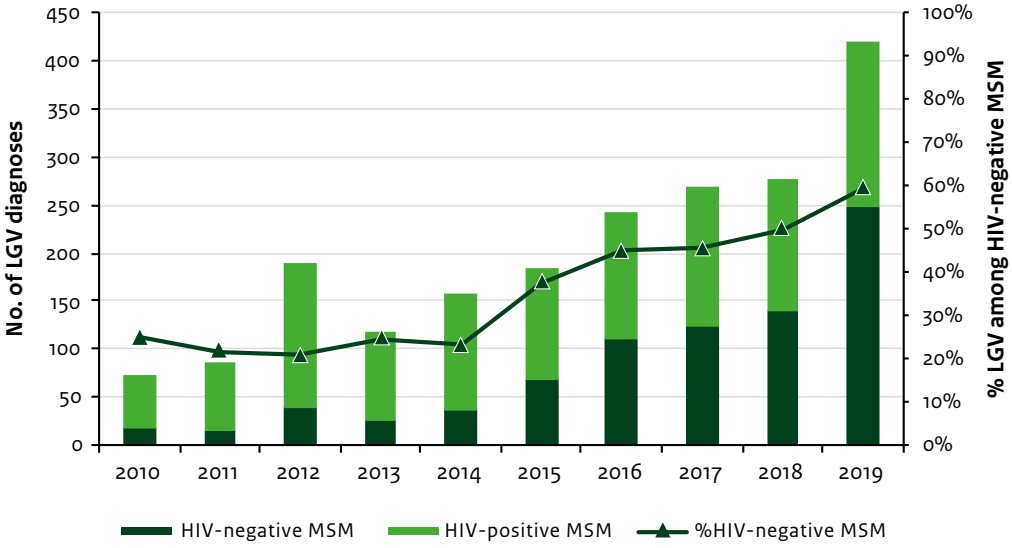
Figure 3.6 Number of positive tests for *Chlamydia trachomatis* from up to 21 medical microbiology laboratories, 2010–2019



Source: 'Virologische weekstaten'
Footnote: 19 medical microbiology laboratories in 2019

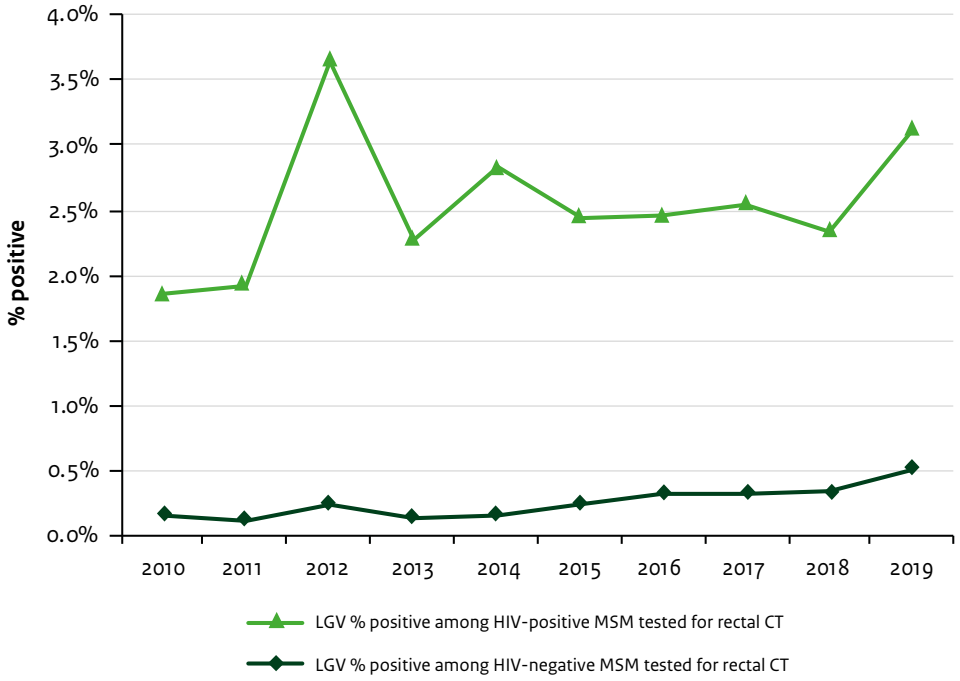
3.5 Lymphogranuloma venereum at Sexual Health Centres

Figure 3.7 Total number of LGV diagnoses among MSM by HIV status, 2010-2019



Footnote: Aggregated data of non-registered consultations included.

Figure 3.8 Rectal LGV positivity rate by HIV status among MSM tested for rectal chlamydia infection, 2010-2019



Footnote: Aggregated data of non-registered consultations included for 2018, but not for 2019.

Table 3.8 Characteristics of MSM diagnosed with LGV, 2014-2019

	2014 (N=152) n (%)	2015 (N=179) n (%)	2016 (N=242) n (%)	2017 (N=271) n (%)	2018 (N=231) n (%)	2019 (N=356) n (%)
Median age (range)	42 (21-63)	41 (18-66)	39 (16-75)	40 (19-73)	43 (20-74)	40 (18-70)
Dutch ethnicity	101 (66.4)	118 (65.9)	158 (65.3)	163 (60.1)	134 (58.0)	220 (61.8)
Known HIV-positive	116 (76.3)	113 (63.1)	131 (54.1)	144 (53.1)	107 (46.3)	138 (38.8)
Notified for LGV	NA	NA	12 (5.0)	11 (4.1)	15 (6.5)	21 (5.9)
Concurrent gonorrhoea	40 (26.3)	48 (26.8)	91 (37.6)	96 (35.4)	73 (31.6)	117 (32.9)
Concurrent syphilis	11 (7.2)	18 (10.1)	31 (12.8)	35 (12.9)	24 (10.4)	28 (7.9)
Concurrent new HIV diagnosis	4 (2.6)	1 (0.6)	2 (0.8)	4 (1.5)	4 (1.7)	4 (1.1)
Symptoms recorded	95 (62.5)	96 (53.6)	142 (58.7)	137 (50.6)	108 (46.8)	145 (40.7)

Footnote: No heterosexual men or women was diagnosed with LGV in 2019. Of 356 LGV infections among MSM, 345 infections were anal, five infections were urethral, one infection was oral and 6 were LGV ulcers (n=1 had both rectal LGV and LGV ulcer).

4 Gonorrhoea

4.1 Key points

4.1.1 Sexual Health Centres

- In 2019, 8,186 patients were diagnosed with gonorrhoea at the SHCs in the Netherlands, an increase of 11.2% compared with 2018. Of these, 15.4% of patients were women, 8.0% heterosexual men and 76.5% MSM.
- Positivity rates for gonorrhoea slightly increased over the past two years among heterosexual men to 2.3% (1.9% in 2017), and among women to 1.9% (1.6% in 2017) and varied between regions. Positivity rates in MSM have been stable at around 11% for the past few years (11.5% in 2019).
- Of all gonorrhoea diagnoses, 16.1% were not registered in the national database. The following key points are based on registered consultations only.

- The highest gonorrhoea positivity rates were seen among persons notified for gonorrhoea (MSM 31.5%, heterosexual men 17.8%, women 33.9%). Other groups with high positivity rates were men with STI symptoms, persons with a previous STI, women and heterosexual men from an STI/HIV endemic area, and women and heterosexual men with a low education level.
- Gonorrhoea positivity rates among women and heterosexual men increased slightly in all age groups, but especially among young persons aged 15-19 (from 2.9% in 2017 to 3.6% in 2019).
- Among MSM, high positivity rates were seen among HIV-positive individuals (19.3%), persons using drugs in relation to sex (16.9%), persons engaging in group sex (16.3%), and MSM who used PrEP in the past three months (16.9%).
- Of the women and heterosexual men diagnosed with gonorrhoea, 42.1% had a chlamydia co-infection. Of MSM diagnosed with gonorrhoea, 3.8% had a syphilis co-infection and 0.8% were newly diagnosed with HIV.

4.1.2 General practice

- The estimated number of gonorrhoea infections diagnosed in general practice greatly increased from 9,550 in 2017 to 11,300 in 2018, an increase of 18.5%. This increase was mainly due to an increase in the number of gonorrhoea episodes among women younger than 25. Also, the reporting rate for gonorrhoea greatly increased in this group: from 0.5 per 1,000 to 0.9 per 1,000 population.

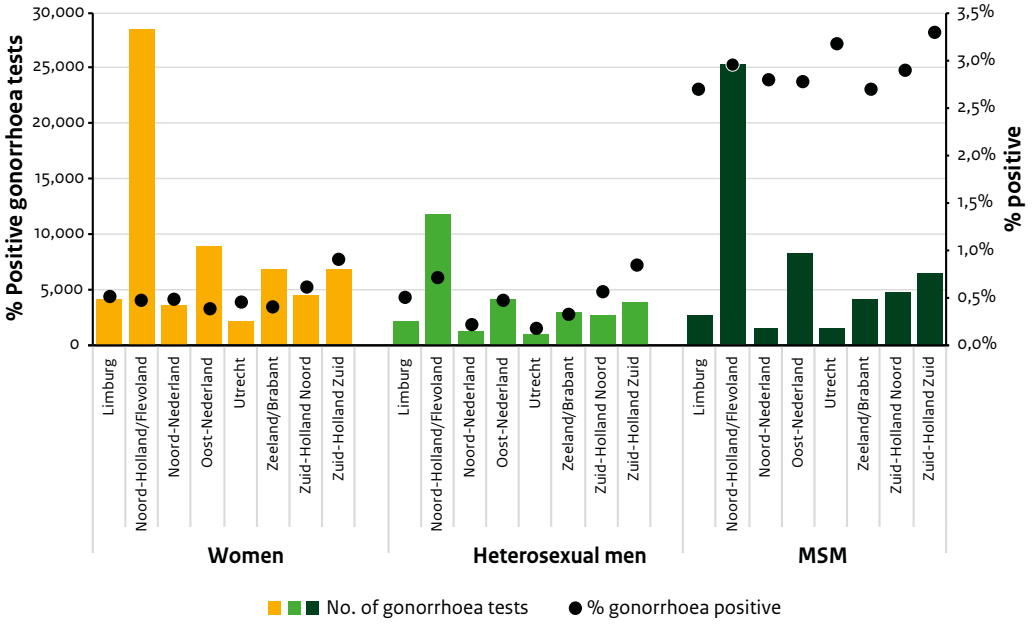
4.1.3 Antimicrobial resistance of gonococci in the Netherlands

- 17 out of 24 SHCs participated in the Gonococcal Resistance to Antimicrobials Surveillance (GRAS) programme in 2019. Within the SHCs participating in GRAS, culture was performed for 77.5% of gonorrhoea patients. Due to negative or failed cultures, susceptibility testing results were available for 39.8% of patients.

- Antimicrobial resistance to ceftriaxone, the first-choice treatment in the Netherlands, was not reported.
- Resistance to cefotaxime remained stable at 1.4%. Resistance to ciprofloxacin greatly increased from 33.7% in 2018 to 54.9% in 2019. Resistance to azithromycin increased in past years to 10.8% in 2018, but this increase did not continue in 2019, with 9.3% of isolates found to be resistant.
- Whilst no increase in the percentage of antimicrobial resistance was seen for azithromycin and ceftriaxone, higher proportions of isolates with reduced susceptibility were seen in 2019 compared with previous years.

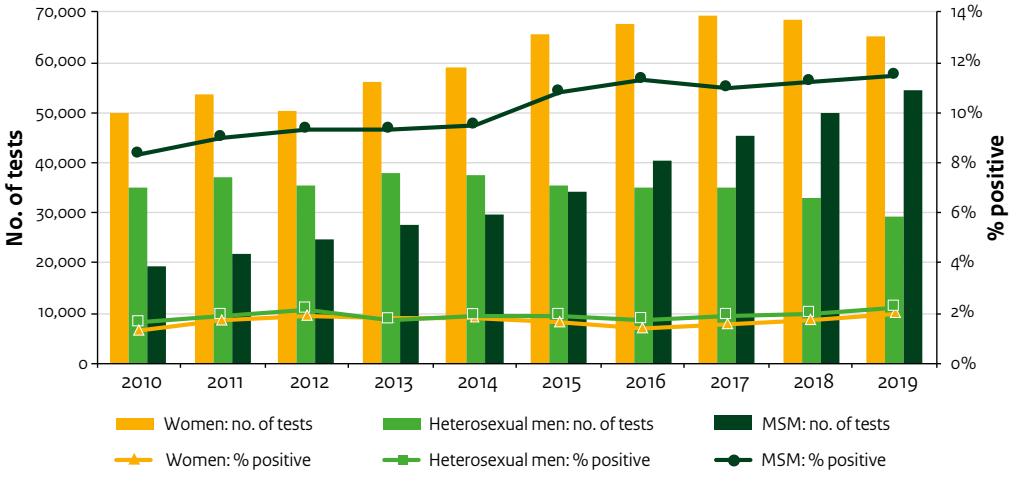
4.2 Sexual Health Centres: characteristics, risk groups and trends

Figure 4.1 Number of gonorrhoea tests and percentage of gonorrhoea positives by region, gender and type of sexual contact, 2019



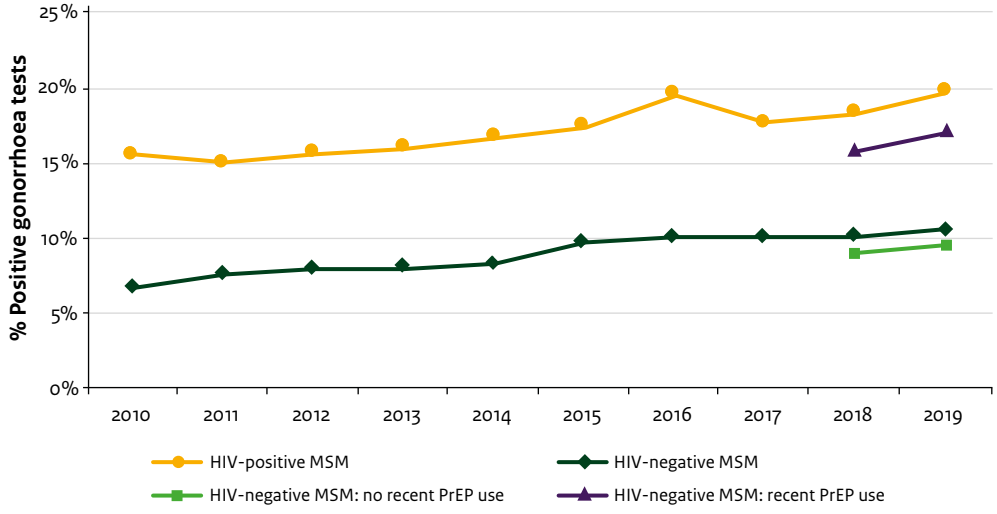
Footnote: Aggregated data of non-registered consultations included.

Figure 4.2 Total number of tests and positivity rate of gonorrhoea by gender and type of sexual contact, 2010–2019



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.

Figure 4.3 Trends in positivity rate for gonorrhoea in MSM by HIV-status and PrEP use, 2010-2019

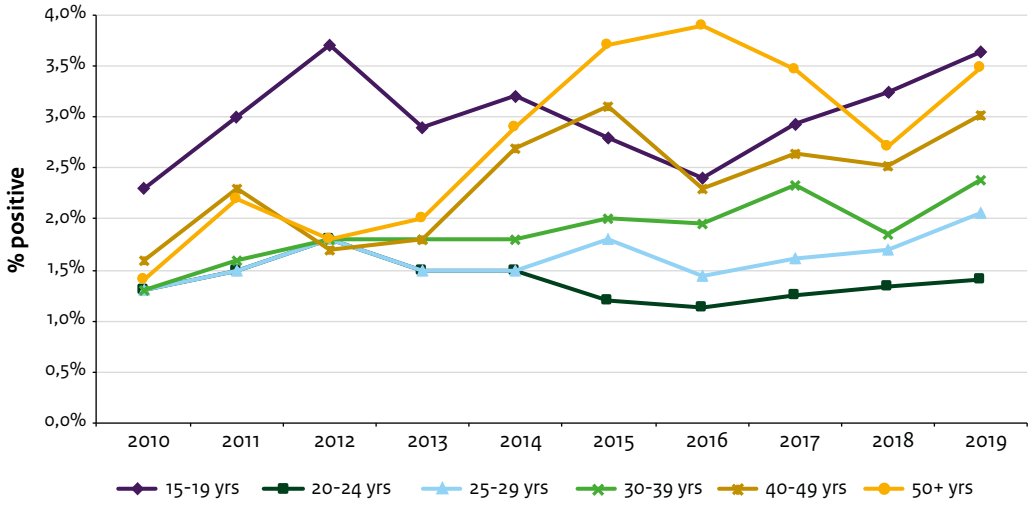


Footnote: Recent PrEP users includes PrEP users via the SHC pilot programme and via other health care providers. Information on PrEP use has been collected since 2018. In 2018, recent PrEP use was defined as use in the past 6 months. Since 2019, recent PrEP use has been defined as use in the past 3 months.

Table 4.1 Number of gonorrhoea diagnoses and persons tested for gonorrhoea by age, gender and type of sexual contact, 2019

Age (years)	Women		Heterosexual men		MSM	
	n positive/N	%	n positive/N	%	n positive/N	%
≤19	276/7,731	3.6	88/2,240	3.9	139/1,005	13.8
20-24	451/32,994	1.4	216/14,390	1.5	801/6,331	12.7
25-29	153/7,528	2.0	99/4,711	2.1	1,122/8,676	12.9
30-34	53/2,276	2.3	37/1,577	2.3	916/6,931	13.2
35-39	26/1,244	2.1	24/769	3.1	630/5,054	12.5
40-44	21/800	2.6	14/364	3.8	495/4,456	11.1
45-49	23/755	3.0	7/239	2.9	373/3,910	9.5
50-54	18/680	2.6	10/195	5.1	347/3,937	8.8
≥ 55	25/555	4.5	6/269	2.2	497/6,001	8.3
Total	**1,046/54,563**	**1.9**	**501/24,754**	**2.0**	**5,320/46,301**	**11.5**

Figure 4.4a Trends in positivity rate for gonorrhoea in women and heterosexual men by age group, 2010-2019



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 4.4b Trends in positivity rate for gonorrhoea in MSM by age group, 2010-2019

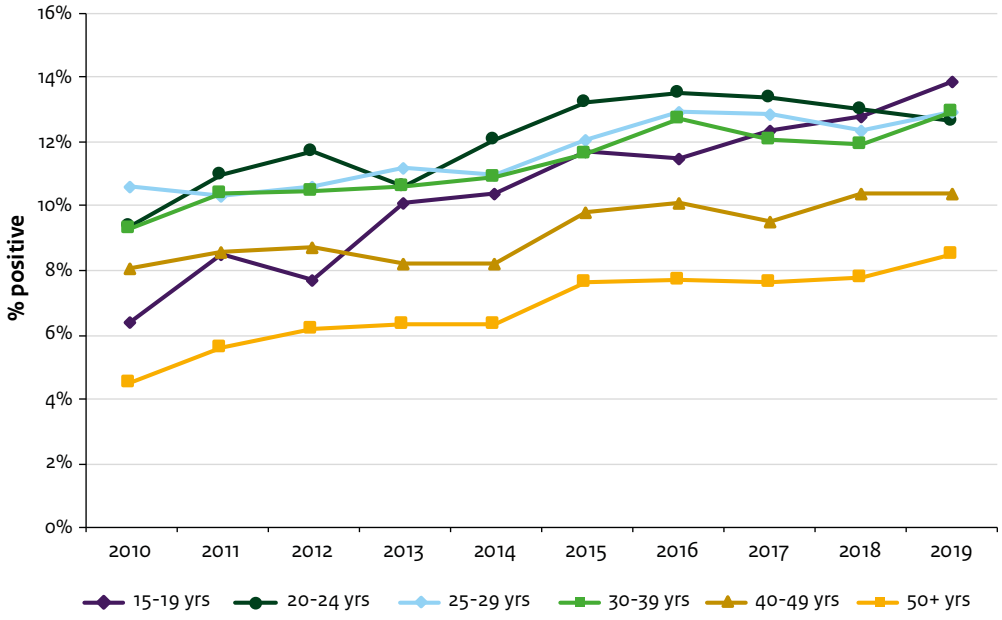


Table 4.2a Number of gonorrhoea diagnoses among persons tested for gonorrhoea by migration background, gender and type of sexual contact, 2019

Migration background	Women		Heterosexual men		MSM	
	n positive/N	%	n positive/N	%	n positive/N	%
Dutch	588/40,396	1.5	152/15,835	1.0	3,336/30,800	10.8
Other Western	111/5,535	2.0	33/2,173	1.5	827/6,997	11.8
First generation non-Western	70/3,043	2.3	107/2,508	4.3	793/5,742	13.8
Second generation non-Western	276/5,566	5.0	209/4,228	4.9	363/2,747	13.2
Non-Western, generation unknown	0/2	0.0	0/0	0.0	0/1	0.0
Unknown	1/21	4.8	0/10	0.0	1/14	7.1
Total	**1,046/54,563**	**1.9**	**501/24,754**	**2.0**	**5,320/46,301**	**11.5**

Table 4.2b Number of gonorrhoea diagnoses among 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, 2019

Region of origin	Women		Heterosexual men		MSM	
	n positive/N	%	n positive/N	%	n positive/N	%
Turkey	21/584	3.6	15/738	2.0	113/780	14.5
North Africa/Morocco	36/818	4.4	31/964	3.2	99/749	13.2
Suriname	104/1,941	5.4	93/1,511	6.2	167/1,210	13.8
Netherlands Antilles/Aruba	81/1,318	6.1	87/1,024	8.5	150/1,019	14.7
Sub-Saharan Africa	41/1,139	3.6	58/1,026	5.7	71/646	11.0
Eastern Europe	35/1,864	1.9	6/422	1.4	205/1,492	13.7
Latin America	35/1,275	2.7	16/480	3.3	274/1,706	16.1
Asia	35/2,041	1.7	20/1,225	1.6	373/3,324	11.2
Total	**388/10,980**	**3.5**	**326/7,390**	**4.4**	**1,452/10,926**	**13.3**

Table 4.3a Number of gonorrhoea diagnoses among persons tested for gonorrhoea by triage indication, gender and type of sexual contact, 2019

	Women		Heterosexual men		MSM	
	n positive/N	%	n positive/N	%	n positive/N	%
Notified						
Not notified	699/45,869	1.5	369/18,076	2.0	3,736/38,275	9.8
Notified for gonorrhoea	214/632	33.9	87/490	17.8	1,116/3,546	31.5
Notified for other STI/HIV	95/6,801	1.4	33/5,494	0.6	398/4,023	9.9
Unknown	38/1,261	3.0	12/694	1.7	70/457	15.3
Symptoms						
No	641/38,350	1.7	128/17,297	0.7	3,498/38,588	9.1
Yes	398/15,947	2.5	371/7,361	5.0	1,817/7,638	23.8
Unknown	7/266	2.6	2/96	2.1	5/75	6.7
STI/HIV endemic area						
No	658/43,583	1.5	175/17,364	1.0	3,868/35,375	10.9
Yes	388/10,980	3.5	326/7,390	4.4	1,452/10,926	13.3

Table 4.3a (continued) Number of gonorrhoea diagnoses among persons tested for gonorrhoea by triage indication, gender and type of sexual contact, 2019

	Women		Heterosexual men		MSM	
	n positive/N	%	n positive/N	%	n positive/N	%
Age <25 years						
No	319/13,838	2.3	197/8,124	2.4	4,380/38,965	11.2
Yes	727/40,725	1.8	304/16,630	1.8	940/7,336	12.8
Partner in risk group*						
No	546/39,388	1.4	338/17,626	1.9	3,059/28,472	10.7
Yes	477/14,373	3.3	158/7,013	2.3	2,177/17,028	12.8
Unknown	23/802	2.9	5/115	4.3	84/801	10.5
Sex worker						
No	895/49,849	1.8	494/24,507	2.0	5,149/45,168	11.4
Yes, in past 6 months	151/4,546	3.3	5/154	3.2	145/878	16.5
Unknown	0/168	0.0	2/93	2.2	26/255	10.2
Gonorrhoea/chlamydia/syphilis in past year						
Not tested	575/33,697	1.7	328/18,428	1.8	1,208/13,802	8.8
Tested, negative	256/14,079	1.8	80/3,986	2.0	1,715/18,455	9.3
Tested, positive	206/6,393	3.2	92/2,220	4.1	2,251/12,780	17.6
Tested, unknown	2/76	2.6	0/13	0.0	46/303	15.2
Unknown	7/318	2.2	1/107	0.9	100/961	10.4

* 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 4.3b Number of gonorrhoea diagnoses among persons tested for gonorrhoea by demographics, (sexual) behavioural characteristics, gender and type of sexual contact, 2019

	Women		Heterosexual men		MSM	
	n positive/N	%	n positive/N	%	n positive/N	%
Educational level[1]						
High	296/32,224	0.9	100/13,864	0.7	3,165/29,238	10.8
Medium	480/15,387	3.1	258/7,887	3.3	1,318/10,205	12.9
Low	178/3,979	4.5	116/2,184	5.3	460/3,713	12.4
Unknown	92/2,973	3.1	27/819	3.3	377/3,145	12.0
Number of partners in past 6 months						
0 partners	11/568	1.9	5/202	2.5	50/579	8.6
1 partner	265/14,079	1.9	87/4,575	1.9	237/3,434	6.9
2 partners	257/13,884	1.9	121/5,054	2.4	362/4,554	7.9
3 or more partners	465/24,260	1.9	286/14,842	1.9	4,598/37,128	12.4
Unknown	48/1,772	2.7	2/81	2.5	73/606	12.0
Receptive anal sex, in past 6 months						
No receptive anal sex	740/42,760	1.7			901/11,729	7.7
Yes, consistently with a condom	28/1,348	2.1			633/7,877	8.0
Yes, not consistently with a condom	261/9,773	2.7			3,747/26,180	14.3
Unknown	17/682	2.5			39/515	7.6
Insertive anal sex, in past 6 months						
No insertive anal sex			416/20,046	2.1	719/8,908	8.1
Yes, consistently with a condom			4/456	0.9	693/8,624	8.0
Yes, not consistently with a condom			51/2,420	2.1	3,876/28,318	13.7
Unknown			30/1,832	1.6	32/451	7.1
Vaginal sex, in past 6 months[2]						
No vaginal sex	1/434	0.2	3/178	1.7	79/930	8.5
Yes, consistently with a condom	84/4,114	2.0	23/1,615	1.4	85/932	9.1
Yes, not consistently with a condom	950/49,402	1.9	466/22,650	2.1	307/4,427	6.9
Unknown	11/613	1.8	9/311	2.9	41/693	5.9

Table 4.3b (continued) Number of gonorrhoea diagnoses among persons tested for gonorrhoea by demographics, (sexual) behavioural characteristics, gender and type of sexual contact, 2019

	Women		Heterosexual men		MSM	
	n positive/N	%	n positive/N	%	n positive/N	%
Receptive oral sex, in past 6 months						
No receptive oral sex	110/6,085	1.8			144/2,021	7.1
Yes, consistently with a condom	33/1,188	2.8			26/374	7.0
Yes, not consistently with a condom	886/45,149	2.0			5,093/43,275	11.8
Unknown	17/2,141	0.8			57/631	9.0
Client of sex worker						
No	880/41,242	2.1	465/23,114	2.0	5,187/44,732	11.6
Yes, in past 6 months	4/125	3.2	34/1,482	2.3	80/1,129	7.1
Unknown	162/13,196	1.2	2/158	1.3	53/440	12.0
Previous HIV test						
No	630/39,122	1.6	301/18,264	1.6	389/4,729	8.2
Yes, positive	2/27	7.4	2/13	15.4	826/4,280	19.3
Yes, negative	399/14,584	2.7	187/6,034	3.1	4,085/37,068	11.0
Yes, result unknown	3/143	2.1	0/48	0.0	8/68	11.8
Unknown	12/687	1.7	11/395	2.8	12/156	7.7
Drug use, in past 6 months[3, 4]						
No					2,970/32,199	9.2
Yes, in past 6 months					2,266/13,374	16.9
Unknown					84/728	11.5
Group sex, in past 6 months[4]						
No					2,528/27,365	9.2
Yes, in past 6 months					2,297/14,092	16.3
Unknown					495/4,844	10.2
Prep use, in past 3 months[4]						
No					3,364/35,346	9.5
Yes					1,130/6,675	16.9
Known HIV-infection, not eligible					826/4,280	19.3

1 Low level of education: no education, elementary school, lbo, mavo, vmbo, mbo-1; medium level of education: mbo2-4, havo, vwo; high level of education: university of applied sciences, university.
2 For MSM: numbers are reported for men who had sex with both men and women (N=6,982). Men who had sex with men only are excluded.
3 Included drugs are cocaine, XTC/MDMA/ Speed, Heroin, Crystal Meth, Mephedrone, 3-MMC, 4-MEC, 4-FA, GHB/ GBL and ketamine.
4 Data not obligatory to collect for heterosexual men and women; results are therefore not shown.

Table 4.4 Concurrent STI among persons diagnosed with gonorrhoea by gender and type of sexual contact, 2019

Concurrent infection	Women (N=1,046) n (%)	Heterosexual men (N=501) n (%)	MSM (N=5,320) n (%)
Chlamydia	422 (40.3)	229 (45.7)	1,226 (23.0)
Syphilis, infectious	0 (0.0)	3 (0.6)	203 (3.8)
HIV newly diagnosed	0 (0.0)	1 (0.2)	43 (0.8)
Genital herpes	1 (0.1)	1 (0.2)	14 (0.3)
Genital warts	6 (0.6)	8 (1.6)	34 (0.6)
Hepatitis B, infectious	0 (0.0)	0 (0.0)	3 (0.1)
Hepatitis C	0 (0.0)	0 (0.0)	17 (0.3)

Footnote: SHCs 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, 2019

Location	Women n positive (%)	Heterosexual men n positive (%)	MSM n positive (%)
Urogenital	802 (1.5)	496 (2.0)	1,214 (2.6)
Anorectal	327 (1.7)	10 (4.8)	3,599 (8.0)
Oral	350 (1.8)	2 (0.8)	2,739 (6.0)

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.

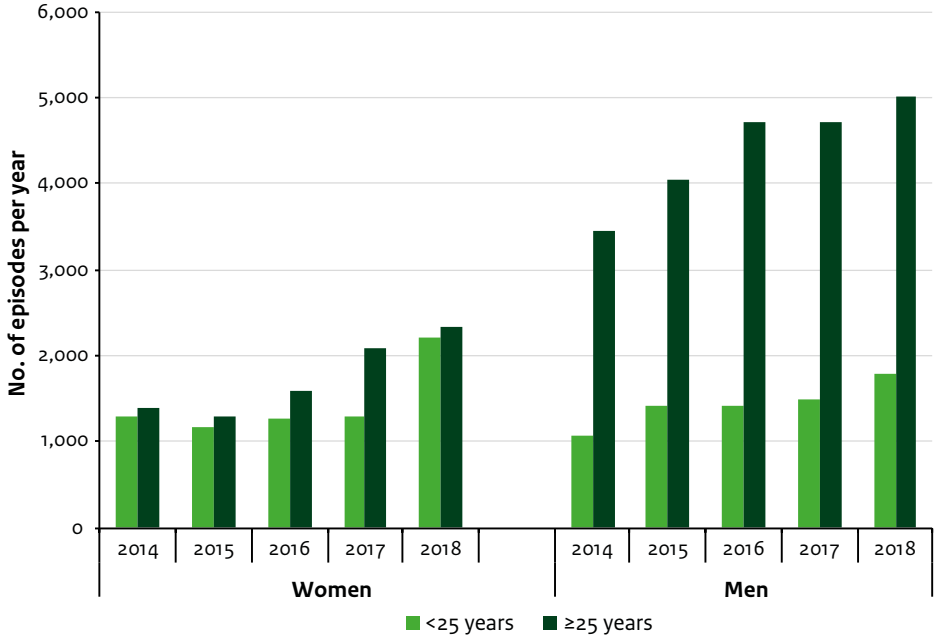
Table 4.6 Anatomic location of gonorrhoea infection by gender and type of sexual contact, 2019

Location	Women (N=1,046) n (%)	Heterosexual men (N=501) n (%)	MSM (N=5,320) n (%)
Urogenital only	471 (45.0)	490 (97.8)	261 (4.9)
Anorectal only	63 (6.0)	3 (0.6)	1,833 (34.5)
Oral only	168 (16.1)	1 (0.2)	1,368 (25.7)
Urogenital and anorectal	162 (15.5)	6 (1.2)	487 (9.2)
Urogenital and oral	80 (7.6)	0 (0.0)	92 (1.7)
Anorectal and oral	13 (1.2)	1 (0.2)	905 (17.0)
Urogenital and anorectal and oral	89 (8.5)	0 (0.0)	374 (7.0)

Footnote: 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.

4.3 General practice

Figure 4.5 Estimated annual number of reported episodes of gonorrhoea in general practice by gender and age group, based on extrapolation from GP practices in Nivel-PCD, 2014-2018



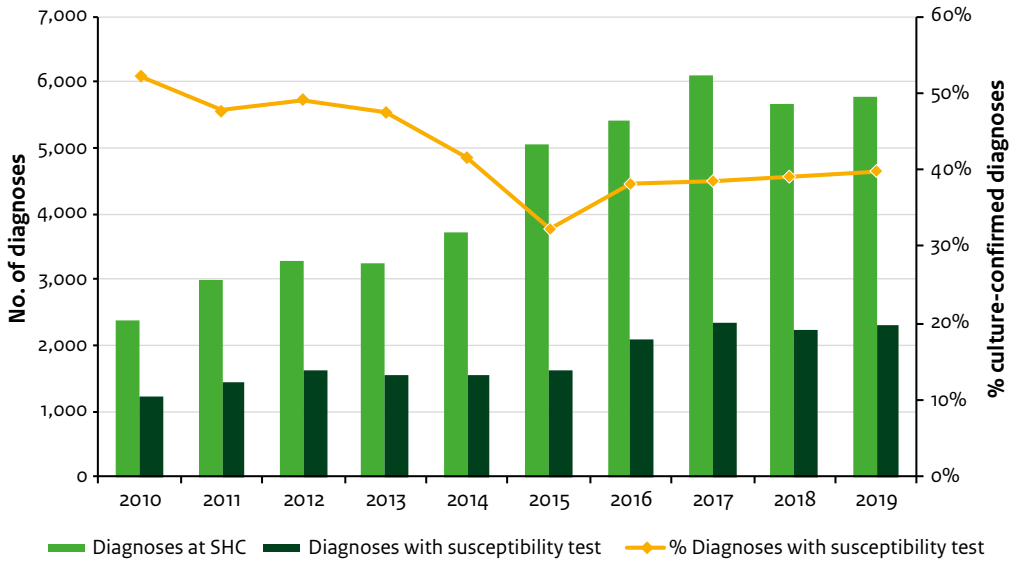
Footnote: About 70% of the total Dutch population consists of persons aged ≥25 years and about 30% consists of persons aged <25 years.

Table 4.7 Annual reporting rate (number of episodes per 1,000 population) of gonorrhoea in general practice in the Netherlands by gender and age group, based on GP practices in Nivel-PCD, 2014-2018

	Women n/1,000			Men n/1,000			Total n/1,000		
	All	**<25**	**≥25**	**All**	**<25**	**≥25**	**All**	**<25**	**≥25**
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
2018	**0.5**	0.9	0.4	**0.8**	0.7	0.8	**0.7**	0.8	0.6

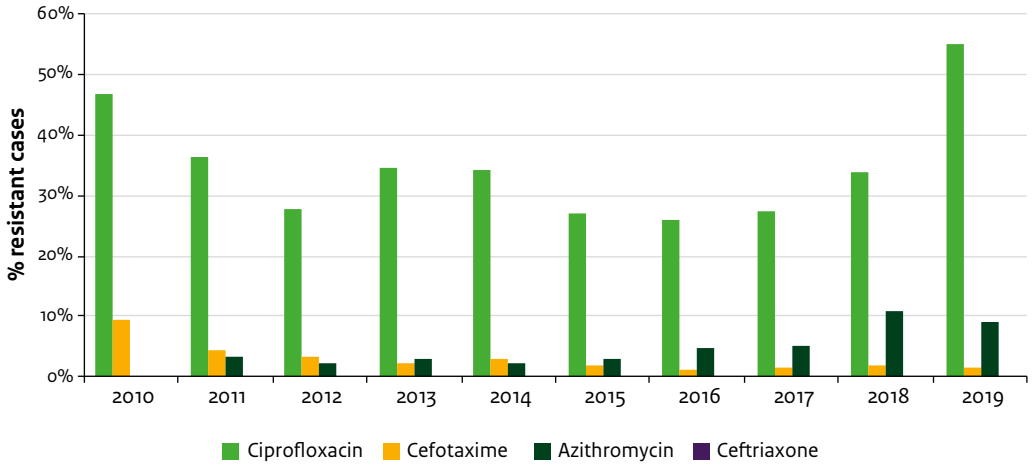
4.4 Antimicrobial resistance of gonococci in the Netherlands

Figure 4.6 Number of gonorrhoea diagnoses and number and percentage of diagnoses including an antimicrobial susceptibility test at SHCs participating in GRAS, 2010-2019



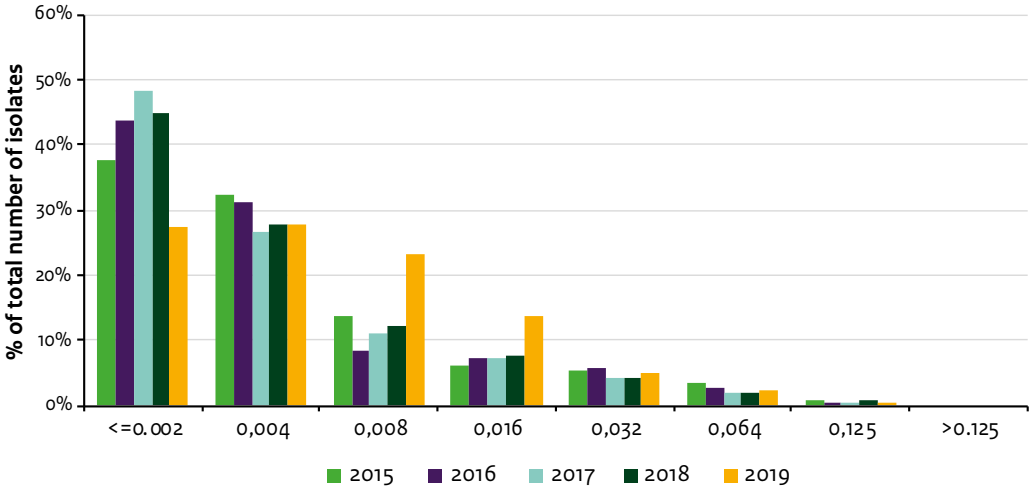
Footnote: In less than half of all gonorrhoea diagnoses at SHCs antimicrobial susceptibility was measured by culture. This can partially be explained by negative cultures, making measurement of resistance levels impossible. Furthermore, the STI register data show that gonorrhoea diagnoses are sometimes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

Figure 4.7 Gonococcal resistance (following EUCAST breakpoints) in the Netherlands, proportion of resistant cases, 2010–2019



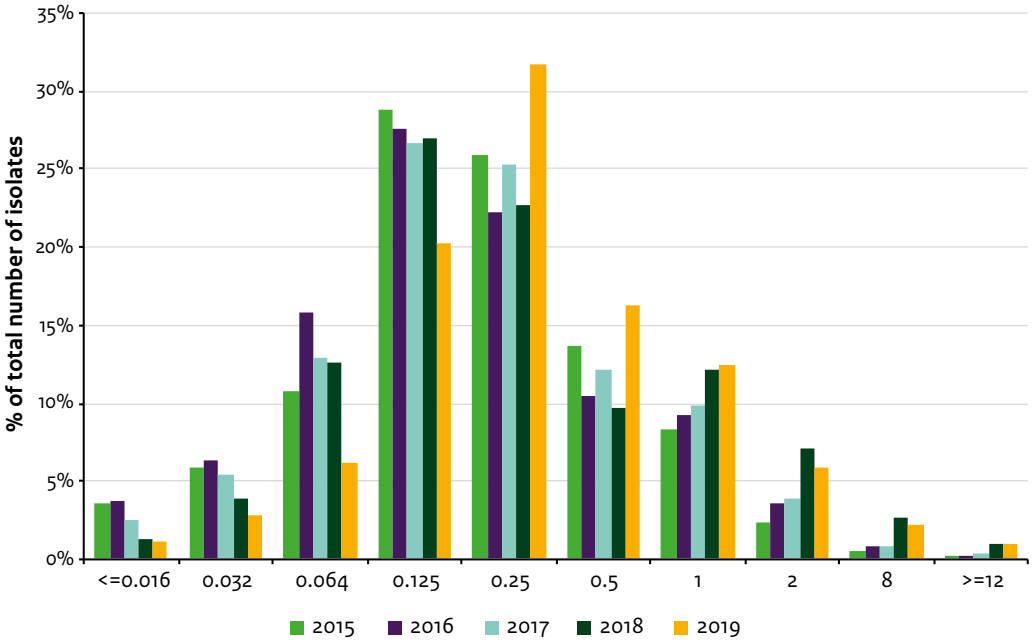
Footnote 1: Resistant following EUCAST criteria, no clinical resistance has been reported yet. In 2019, EUCAST changed the definition for azithromycin resistance. Trends for azithromycin have retrospectively been altered based on the new criterion.
Footnote 2: In 2011, ceftriaxone and azithromycin were added to the panel.
Footnote 3: No resistance to ceftriaxone has been reported yet.

Figure 4.8a MIC (= minimum inhibitory concentration) distribution for ceftriaxone, 2015-2019



Footnote: Following EUCAST criteria, an MIC of >0.125 mg/L is considered resistant.

Figure 4.8b MIC (= minimum inhibitory concentration) distribution for azithromycin, 2015-2019



Footnote: Following EUCAST breakpoints, no clinical breakpoint for azithromycin is available. An MIC of >1.0 mg/L is considered the epidemiological cut-off value for resistance.

5 Syphilis

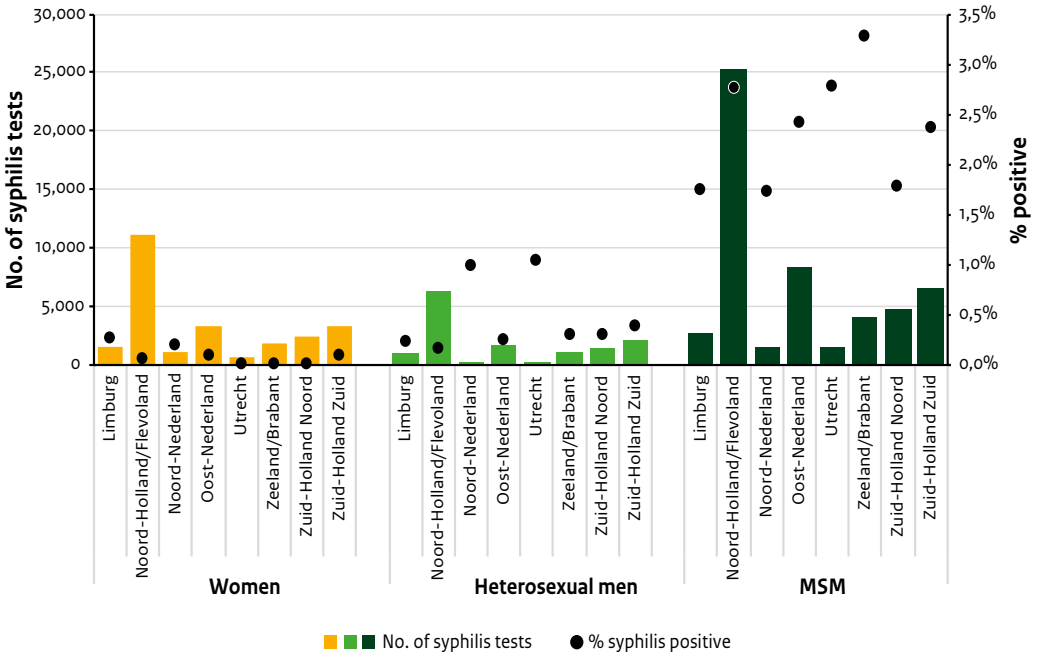
5.1 Key points

- In 2019, 1,430 clients (96.4% MSM, 2.4% heterosexual men, 1.8% women) were diagnosed with infectious syphilis at SHCs in the Netherlands.
- The number of diagnoses of infectious syphilis increased by 16.8% compared with 2018 (1,224).
- The percentage of positive tests for infectious syphilis among MSM decreased from 2.9% in 2016 to 2.4% in 2018 and 2.5% in 2019.
- The number of tests among women (n=24,903) and heterosexual men (n=13,607) decreased compared with 2018 (28,786 and 16,906 tests respectively). The number of syphilis diagnoses among heterosexual men was 26 in 2018 and 35 in 2019; among women this decreased from 22 in 2018 to 17 in 2019.
- Of all diagnoses, 239 (16.7%) were not registered in the national database. The following key points are based on registered consultations only.

- Among HIV-positive MSM, there was an increase in the positivity rate (7.5% in 2019 compared with 6.7% in 2018). The positivity rate among HIV-negative MSM remained stable (2% in 2019).
- Subgroups with relatively higher positivity rates among MSM included those notified for syphilis exposure (12.2%), known HIV-positives (7.4%), those with STI related symptoms (6.9%) and PrEP use in the last 3 months (3.4%).
- Of the MSM diagnosed with infectious syphilis, 19.7% had a co-infection with chlamydia and 17.0% 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 2010 (1 in 2019).

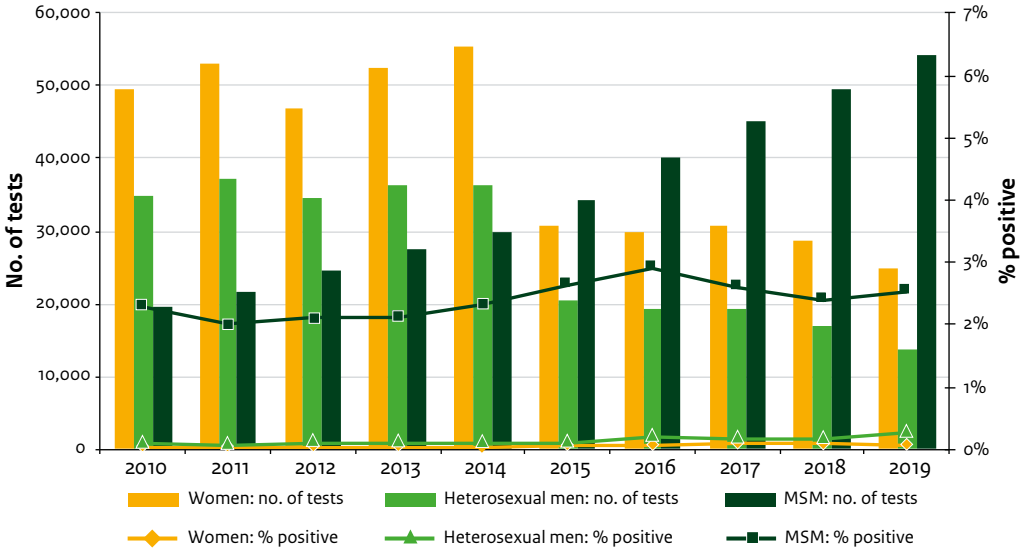
5.2 Sexual Health Centres: characteristics, risk groups and trends

Figure 5.1 Number of syphilis tests and percentage of syphilis positives by region, gender and type of sexual contact, 2019



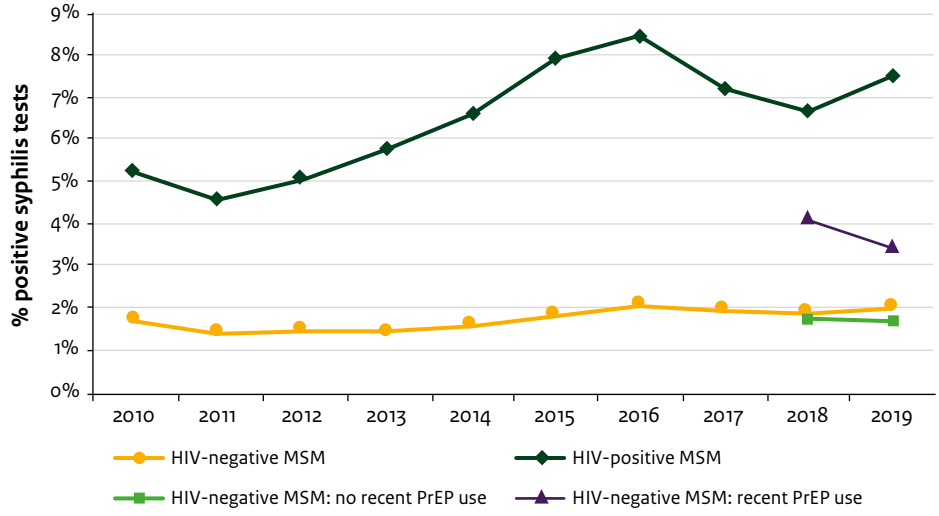
Footnote: Aggregated data of non-registered consultations included.

Figure 5.2 Total number of tests and positivity rate of infectious syphilis by gender and type of sexual contact, 2010–2019



Footnote: Aggregated data of non-registered consultations included.

Figure 5.3 Trends in positivity rate for infectious syphilis in MSM by HIV-status and PrEP use, 2010-2019



Footnote: Recent PrEP users includes PrEP users via the SHC pilot programme and via other health care providers. Information on PrEP use has been collected since 2018. In 2018, recent PrEP use was defined as use in the past 6 months. Since 2019, recent PrEP use has been defined as use in the past 3 months.

Table 5.1 Number of infectious syphilis diagnoses among MSM tested for syphilis by age, gender and type of sexual contact, 2019

Age (years)	MSM	
	n positive/N	%
≤19	26/1,003	2.59
20–24	97/6,295	1.54
25–29	178/8,654	2.06
30–34	163/6,908	2.36
35–39	162/5,037	3.22
40–44	131/4,446	2.95
45–49	125/3,894	3.21
50–54	121/3,921	3.09
≥ 55	147/5,970	2.46
Total	**1,150/46,128**	**2.49**

Table 5.2a Number of infectious syphilis diagnoses among MSM tested for syphilis by migration background, gender and type of sexual contact, 2019

Migration background	MSM	
	n positive/N	%
Dutch	728/30,630	2.38
Other Western	171/6,997	2.44
First generation non-Western	188/5,752	3.27
Second generation non-Western	63/2,732	2.31
Non-Western, generation unknown	0/1	0.00
Unknown	0/16	0.00
Total	**1,150/46,128**	**2.49**

Table 5.2b Number of infectious syphilis diagnoses among MSM tested for syphilis among first and second generation migrants from an STI/HIV endemic area by region of origin, gender and type of sexual contact, 2019

Region of origin	MSM	
	n positive/N	%
Turkey	13/774	1.68
North Africa/Morocco	19/744	2.55
Suriname	38/1,209	3.14
Netherlands Antilles/Aruba	33/1,017	3.24
Eastern Europe	51/1,497	3.41
Sub-Saharan Africa	12/641	1.87
Latin America	72/1,712	4.21
Asia	80/3,330	2.40
Total	**318/10,924**	**2.91**

Table 5.3a Number of infectious syphilis diagnoses among MSM tested for syphilis by triage indication, 2019

	MSM	
	n positive/N	%
Notified		
Not notified	808/38,222	2.1
Notified for syphilis	193/1,584	12.2
Notified for other STI/HIV	134/5,869	2.3
Unknown	15/453	3.3
Symptoms		
No	630/38,514	1.6
Yes	520/7,541	6.9
Unknown	0/73	0.0
STI/HIV endemic area		
No	832/35,204	2.4
Yes	318/10,924	2.9
Age <25 years		
No	1,027/38,830	2.6
Yes	123/7,298	1.7
Partner in risk group*		
No	675/28,322	2.4
Yes	454/17,010	2.7
Unknown	21/796	2.6
Sex worker		
No	1,103/44,983	2.5
Yes, in past 6 months	35/876	4.0
Unknown	12/269	4.5
Gonorrhoea/chlamydia/syphilis in past year		
Not tested	265/13,734	1.9
Tested, negative	369/18,392	2.0
Tested, positive	480/12,727	3.8
Tested, unknown	20/301	6.6
Unknown	16/974	1.6

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

Table 5.3b Number of infectious syphilis diagnoses among MSM tested for syphilis by demographics and (sexual) behavioural characteristics, 2019

	MSM	
	n positive/N	%
Educational level[1]		
High	622/29,171	2.1
Medium	281/10,145	2.8
Low	130/3,686	3.5
Unknown	117/3,126	3.7
Number of partners in past 6 months		
0 partners	12/625	1.9
1 partner	62/3,417	1.8
2 partners	96/4,516	2.1
3 or more partners	964/36,982	2.6
Unknown	16/588	2.7
Receptive anal sex, in past 6 months		
No receptive anal sex	164/11,662	1.4
Yes, consistently with a condom	111/7,846	1.4
Yes, not consistently with a condom	864/26,067	3.3
Unknown	11/553	2.0
Insertive anal sex, in past 6 months		
No insertive anal sex	173/8,865	2.0
Yes, consistently with a condom	120/8,599	1.4
Yes, not consistently with a condom	853/28,176	3.0
Unknown	4/488	0.8
Vaginal sex, in past 6 months[2]		
No vaginal sex	25/930	2.7
Yes, consistently with a condom	17/920	1.8
Yes, not consistently with a condom	55/4,397	1.3
Unknown	12/693	1.7
Receptive oral sex, in past 6 months		
No receptive oral sex	37/2,007	1.8
Yes, consistently with a condom	6/373	1.6
Yes, not consistently with a condom	1,095/43,084	2.5
Unknown	12/664	1.8

Table 5.3b (continued) Number of infectious syphilis diagnoses among MSM tested for syphilis by demographics and (sexual) behavioural characteristics, 2019

	MSM	
	n positive/N	%
Client of sex worker		
No	1,124/44,550	2.5
Yes, in past 6 months	16/1,122	1.4
Unknown	10/456	2.2
Previous HIV test		
No	67/4,696	1.4
Yes, positive	311/4,229	7.4
Yes, negative	769/36,980	2.1
Yes, result unknown	2/66	3.0
Unknown	1/157	0.6
Drug use, in past 6 months[3]		
No	631/32,081	2.0
Yes, in past 6 months	499/13,331	3.7
Unknown	20/716	2.8
Group sex, in past 6 months		
No	557/27,203	2.0
Yes, in past 6 months	466/14,000	3.3
Unknown	127/4,925	2.6
Prep use, in past 3 months		
No	611/35,263	1.7
Yes	228/6,636	3.4
Known HIV-infection, not eligible	311/4,229	7.4

[1] Low level of education: no education, elementary school, lbo, mavo, vmbo, mbo-1; medium level of education: mbo2-4, havo, vwo; high level of education: university of applied sciences, university.
[2] Numbers are reported for men who had sex with both men and women (N=6,940). Men who had sex with men only are excluded.
[3] Included drugs are cocaine, XTC/MDMA/ Speed, Heroin, Crystal Meth, Mephedrone, 3-MMC, 4-MEC, 4-FA, GHB/GBL and ketamine.

Table 5.4 Concurrent STI by gender and type of sexual contact among persons diagnosed with infectious syphilis, 2019

Concurrent infection	MSM (N=474) n (%)
Chlamydia	235 (19.7)
Gonorrhoea	203 (17.0)
HIV newly diagnosed	15 (1.3)
Genital herpes	9 (0.8)
Genital warts	7 (0.6)
Hepatitis B, infectious	4 (0.3)
Hepatitis C	1 (0.1)

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

5.3 Antenatal screening

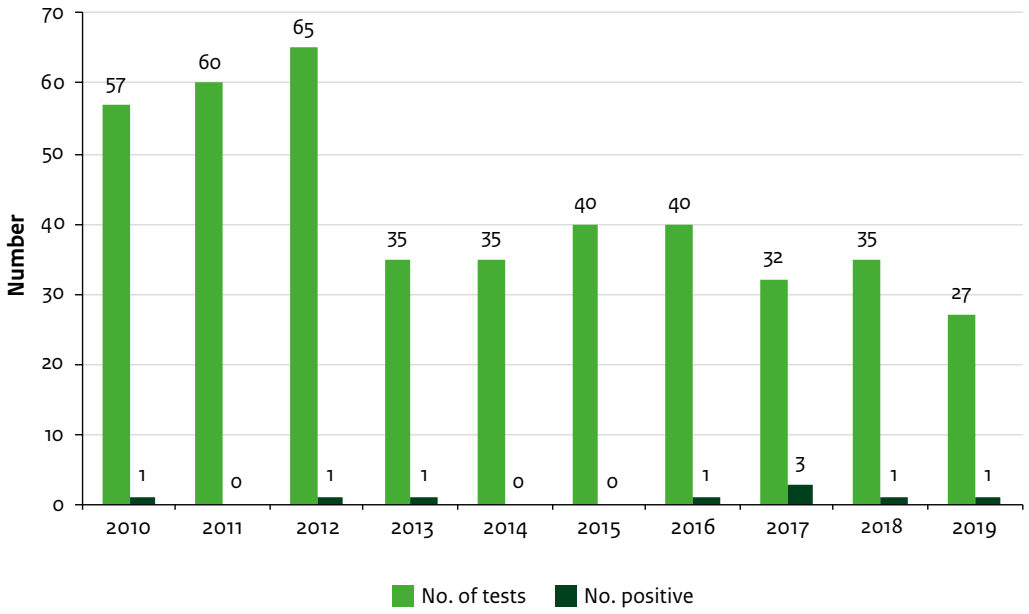
Table 5.5 Syphilis prevalence estimates in pregnant women, based on test results of antenatal screening, 2013-2018

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
2018	171,228	18	0.01

Sources: C.P.B. van der Ploeg (TNO), P. Oomen (RIVM), K. Vos (RIVM). Prenatale Screening Infectieziekten en Erytrocytenimmunisatie (PSIE). Procesmonitor 2018. TNO/RIVM 2020; and earlier monitors.

5.4 Congenital syphilis

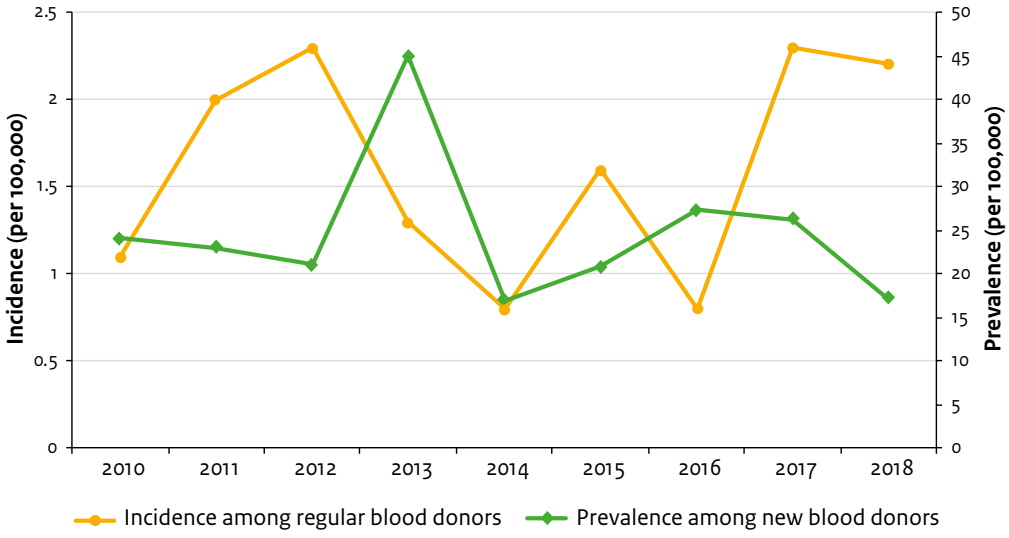
Figure 5.4 Number of tests among neonates and young infants (<1 year) suspected of being infected with congenital syphilis and the number of IgM positives, 2010–2019



Source: RIVM/CIb/IDS

5.5 Blood donors

Figure 5.5 Syphilis incidence among regular blood donors and prevalence among new blood donors (per 100,000) in the Netherlands, 2010-2018



Source: Sanquin

VIRAL STI

6 HIV and AIDS

6.1 Key points

6.1.1 Sexual Health Centres

- The number of individuals newly diagnosed with HIV further decreased by 34% from 249 in 2018 to 164 in 2019.
- Among MSM, 152 HIV infections were diagnosed (93% of total); a 32% decrease compared with the number of HIV diagnoses in 2018 (n=224). The number of new HIV diagnoses among heterosexual men (n=4) and women (n=8) was low (11 and 14 in 2018 respectively).
- The positivity rate among MSM has been decreasing for years and further decreased in 2019 from 2.0% in 2010 to 0.3% in 2019. The positivity rate was 0.03% among both heterosexual men and women.
- Of all diagnoses, 26 (16%) were not registered in the national database. The following key point is based on registered consultations only.
- The highest positivity rates were found among MSM notified for HIV (4.0%). In addition, higher rates were found among MSM who originated from Latin America (1.4%) and Netherlands Antilles/Aruba (1.4%).

6.1.2 HIV treatment centres

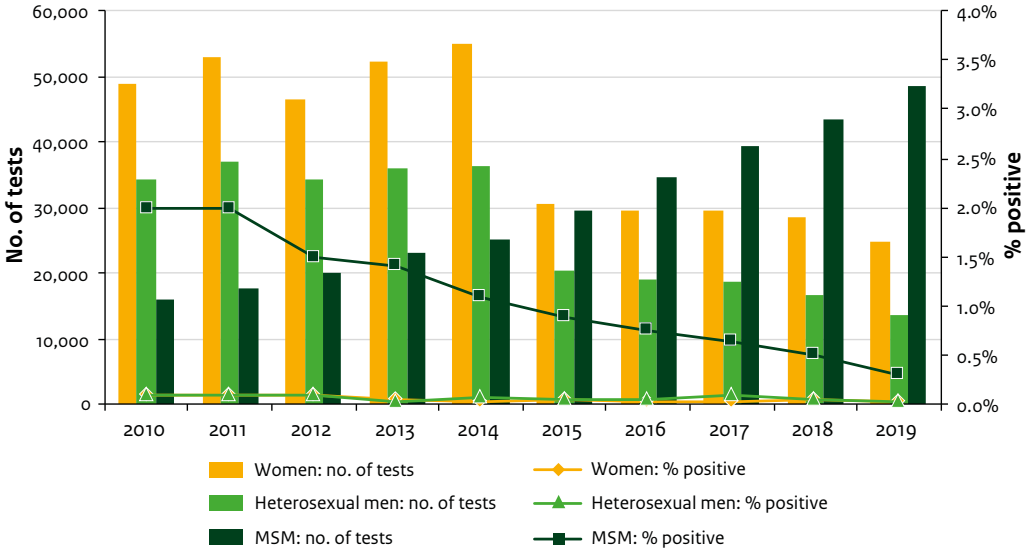
- In total, 20,724 HIV-positive individuals were reported to be in clinical care as of December 2019.
- In 2019, 972 HIV-positive individuals were newly registered in care (911 in 2018). Of the newly registered HIV-positive individuals, 482 were diagnosed in 2019 (527 in 2018) (incomplete due to reporting delay). The proportion of MSM (64%) was lower than it was in 2018 (69%). The proportion of heterosexuals (males and females) was 28% in 2019 (23% in 2018).
- Of HIV-positive MSM entering care and diagnosed in 2019, 38% were diagnosed at SHCs, 36% by GPs, and 18% in hospitals. Of heterosexual males, 50% were diagnosed in hospitals, 37% by GPs, and 5% at SHCs. Of women, 37% were diagnosed in hospitals, 41% by GPs, 15% through pregnancy screening, and 4% at SHCs.
- Of HIV-positive individuals diagnosed in 2019, 21% had a newly acquired HIV infection (<6 months). This proportion was 25% for MSM and 4% for heterosexual men and women.
- Of HIV-positive individuals diagnosed in 2019, 46% presented late (CD4<350/mm3, or AIDS-defining event, regardless of CD4 count). This proportion was lower for MSM (37%) than for women (59%) and heterosexual men (54%).
- In 2018, approximately 92% of people living with HIV were estimated to have been diagnosed and linked to care. Of these people, 93% had started combination antiretroviral therapy (cART) and 96% had a suppressed viral load. Among MSM, these were 93%, 95%, and 97% respectively.

6.1.3 General practice

- In general practice, an estimated number of 26,523 prevalent HIV cases were reported in 2018; a reporting rate of 1.5 per 1,000 population. Prevalence rates were higher in men than they were in women (2.4 versus 0.7/1,000).

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, 2010-2019



Footnote: Aggregated data of non-registered consultations included.

Table 6.1 Number of HIV diagnoses among MSM tested for HIV by age, 2019

Age (years)	MSM	
	n positive/N	%
≤19	5/1,000	0.50
20-24	19/6,192	0.31
25-29	29/8,252	0.35
30-34	27/6,286	0.43
35-39	13/4,412	0.29
40-44	13/3,911	0.33
45-49	8/3,364	0.24
50-54	8/3,234	0.25
≥ 55	7/5,083	0.14
Total	**129/41,734**	**0.31**

Footnote: In addition, 8 women, 4 heterosexual men and 10 transgenders were newly diagnosed with HIV.

Table 6.2a Number of HIV diagnoses among MSM tested for HIV by migration background, 2019

Migration background	MSM	
	n positive/N	%
Dutch	57/27,984	0.20
Other Western	20/6,254	0.32
First generation non-Western	40/4,946	0.81
Second generation non-Western	12/2,534	0.47
Non-Western, generation unknown	0/1	0.00
Unknown	0/15	0.00
Total	**129/41,734**	**0.31**

Table 6.2b Number of HIV diagnoses and MSM tested for HIV among first and second generation migrants from an STI/HIV endemic area by region of origin, 2019

Region of origin	MSM	
	n positive/N	%
Turkey	1/732	0.14
North Africa/Morocco	6/686	0.87
Suriname	5/1,044	0.48
Netherlands Antilles/Aruba	12/888	1.35
Eastern Europe	7/1,292	0.54
Sub-Saharan Africa	4/577	0.69
Latin America	18/1,338	1.35
Asia	10/3,056	0.33
Total	**63/9,613**	**0.66**

Table 6.3a Number of HIV diagnoses among MSM tested for HIV by triage indication, 2019

	MSM	
	n positive/N	%
Notified		
Not notified	88/35,107	0.3
Notified for HIV	12/303	4.0
Notified for other STI/HIV	26/5,932	0.4
Unknown	3/392	0.8
Symptoms		
No	82/35,248	0.2
Yes	47/6,418	0.7
Unknown	0/68	0.0
STI/HIV endemic area		
No	66/32,121	0.2
Yes	63/9,613	0.7
Age <25 years		
No	105/34,542	0.3
Yes	24/7,192	0.3

Table 6.3a (continued) Number of HIV diagnoses among MSM tested for HIV by triage indication, 2019

	MSM	
	n positive/N	%
Partner in risk group*		
No	70/25,688	0.3
Yes	56/15,304	0.4
Unknown	3/742	0.4
Sex worker		
No	120/40,690	0.3
Yes, in past 6 months	9/794	1.1
Unknown	0/250	0.0
Gonorrhoea/chlamydia/syphilis in past year		
Not tested	67/13,012	0.5
Tested, negative	31/16,898	0.2
Tested, positive	29/10,632	0.3
Tested, unknown	2/271	0.7
Unknown	0/921	0.0

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

Table 6.3b Number of HIV diagnoses among MSM tested for HIV by demographics and (sexual) behavioural characteristics, 2019

	MSM	
	n positive/N	%
Educational level[1]		
High	65/26,685	0.2
Medium	41/9,094	0.5
Low	9/3,215	0.3
Unknown	14/2,740	0.5
Number of partners in past 6 months		
0 partners	1/609	0.2
1 partner	15/3,183	0.5
2 partners	14/4,138	0.3
3 or more partners	95/33,312	0.3
Unknown	4/492	0.8

Table 6.3b (continued) Number of HIV diagnoses among MSM tested for HIV by demographics and (sexual) behavioural characteristics, 2019

	MSM	
	n positive/N	%
Receptive anal sex, in past 6 months		
No receptive anal sex	11/11,177	0.1
Yes, consistently with a condom	15/7,489	0.2
Yes, not consistently with a condom	102/22,535	0.5
Unknown	1/533	0.2
Insertive anal sex, in past 6 months		
No insertive anal sex	27/8,242	0.3
Yes, consistently with a condom	14/8,248	0.2
Yes, not consistently with a condom	88/24,770	0.4
Unknown	0/474	0.0
Vaginal sex, in past 6 months[2]		
No vaginal sex	7/895	0.8
Yes, consistently with a condom	5/881	0.6
Yes, not consistently with a condom	12/4,299	0.3
Unknown	2/646	0.3
Receptive oral sex, in past 6 months		
No receptive oral sex	2/1,887	0.1
Yes, consistently with a condom	2/347	0.6
Yes, not consistently with a condom	124/38,866	0.3
Unknown	1/634	0.2
Client of sex worker		
No	129/40,265	0.3
Yes, in past 6 months	0/1,032	0.0
Unknown	0/437	0.0
Previous HIV test		
No	25/4,675	0.5
Yes, positive	NA	NA
Yes, negative	102/36,830	0.3
Yes, result unknown	1/62	1.6
Unknown	1/159	0.6

Table 6.3b (continued) Number of HIV diagnoses among MSM tested for HIV by demographics and (sexual) behavioural characteristics, 2019

	MSM	
	n positive/N	%
Drug use, in past 6 months[3]		
No	77/29,810	0.3
Yes, in past 6 months	50/11,275	0.4
Unknown	2/649	0.3
Group sex, in past 6 months		
No	85/25,271	0.3
Yes, in past 6 months	42/11,993	0.4
Unknown	2/4,470	0.0

Abbreviations: NA: not applicable

[1] Low level of education: no education, elementary school, lbo, mavo, vmbo, mbo-1; medium level of education: mbo2-4, havo, vwo; high level of education: university of applied sciences, university.

[2] Numbers are shown for men who had sex with both men and women (N=6,721). Men who had sex with men only are excluded.

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

Table 6.4 Concurrent STI among MSM newly diagnosed with HIV, 2019

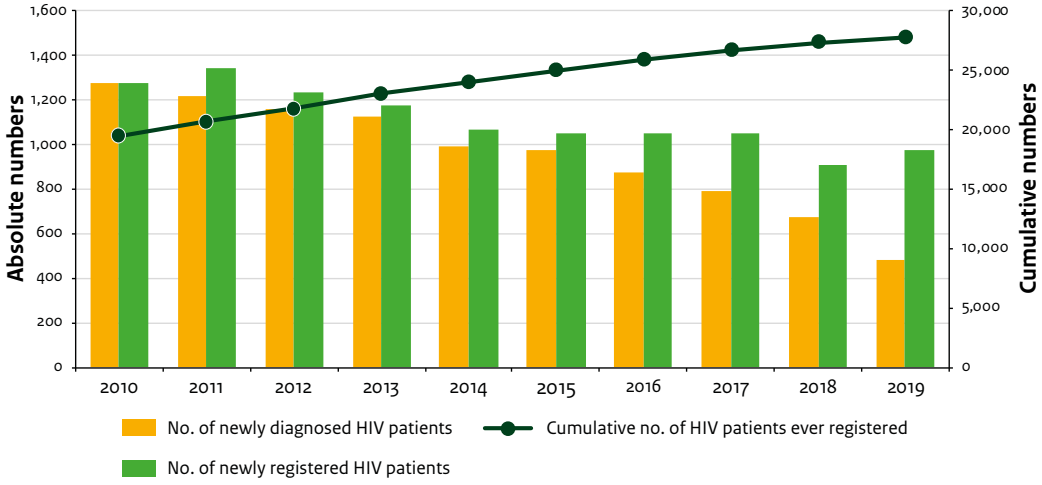
Concurrent infection	MSM (N=129) n (%)
Chlamydia	43 (33.3)
Gonorrhoea	43 (33.3)
Syphilis, infectious	15 (11.6)
Genital herpes	2 (1.6)
Genital warts	0 (0.0)
Hepatitis B, infectious	1 (0.8)
Hepatitis C	0 (0.0)

Footnote: SHCs 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 2019

Figure 6.2 Number of newly diagnosed HIV-positive individuals and newly registered HIV-positive individuals by year, 2010-2019



Source: Stichting HIV Monitoring, 2019 incomplete.

Table 6.5a Number of HIV-positive individuals diagnosed in 2019 by age and main transmission category, as of December 31, 2019

Age (years)	Women (%)	Heterosexual men (%)	MSM (%)	Other/unknown* (%)
0-14	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
15-19	1 (1.4)	0 (0.0)	3 (1.0)	1 (2.5)
20-24	8 (11.3)	5 (8.1)	36 (11.7)	1 (2.5)
25-29	10 (14.1)	10 (16.1)	58 (18.8)	3 (7.5)
30-39	21 (29.6)	14 (22.6)	83 (26.9)	8 (20.0)
40-49	12 (16.9)	17 (27.4)	72 (23.3)	10 (25.0)
50-59	12 (16.9)	10 (16.1)	40 (12.9)	6 (15.0)
60-69	4 (5.6)	4 (6.5)	10 (3.2)	10 (25.0)
70-79	3 (4.2)	2 (3.2)	7 (2.3)	1 (2.5)
≥ 80	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Total	**71**	**62**	**309**	**40**

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

Table 6.5b Number of HIV-positive individuals in care, by age at diagnosis and main transmission category, as of December 31, 2019

Age (years)	Women (%)	Heterosexual men (%)	MSM (%)	Other/unknown* (%)
0-14	3 (0.1)	0 (0.0)	5 (0.0)	331 (19.0)
15-19	157 (4.6)	31 (1.2)	223 (1.7)	42 (2.4)
20-24	481 (14.2)	167 (6.6)	1,174 (9.0)	143 (8.2)
25-29	738 (21.8)	302 (12.0)	2.080 (15.9)	215 (12.4)
30-39	1,139 (33.6)	868 (34.5)	4,484 (34.3)	453 (26.0)
40-49	493 (14.5)	673 (26.7)	3,277 (25.1)	287 (16.5)
50-59	267 (7.9)	343 (13.6)	1,409 (10.8)	152 (8.7)
60-69	74 (2.2)	113 (4.5)	357 (2.7)	66 (3.8)
70-79	19 (0.6)	15 (0.6)	50 (0.4)	15 (0.9)
≥ 80	22 (0.6)	1 (0.0)	0 (0.0)	0 (0.0)
Unknown	0 (0.0)	4 (0.2)	15 (0.1)	36 (2.1)
Total	**3,393**	**2,517**	**13,074**	**1,740**

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

Table 6.6 Number of HIV-positive individuals diagnosed in 2019 and number of HIV-positive individuals in care by gender and main reported transmission risk group, as of December 31, 2019

Transmission risk group	Women		Men		Total	
	2019 (%)	Total in care (%)	2019 (%)	Total in care (%)	2019 (%)	Total in care (%)
MSM	-	-	309 (76.1)	13,074 (77.6)	309 (64.1)	13,074 (63.1)
Heterosexual contact	71 (93.4)	3,393 (87.8)	62 (15.3)	2,517 (14.9)	133 (27.6)	5,910 (28.5)
Injecting drug use	1 (1.3)	82 (2.1)	1 (0.2)	189 (1.1)	2 (0.4)	271 (1.3)
Blood or blood products	0 (0.0)	95 (2.5)	5 (1.2)	168 (1.0)	5 (1.0)	263 (1.3)
Mother to child	0 (0.0)	156 (4.0)	29 (7.1)	152 (0.9)	29 (6.0)	308 (1.5)
Other/unknown	4 (5.3)	140 (3.6)	0 (0.0)	758 (4.5)	4 (0.8)	898 (4.3)
Total	**76**	**3,866**	**406**	**16,858**	**482**	**20,724**

Table 6.7a Number of HIV-positive individuals diagnosed in 2019 by region of origin and main transmission category, as of December 31, 2019

Region of origin	Women n (%)	Heterosexual men n (%)	MSM n (%)	Other/unknown* n (%)
The Netherlands	22 (31.0)	38 (61.3)	179 (57.9)	23 (57.5)
Europe, other	3 (4.2)	4 (6.5)	32 (10.4)	6 (15.0)
Caribbean & Latin America	11 (15.5)	6 (9.7)	59 (19.1)	4 (10.0)
Sub-Saharan Africa	27 (38.0)	9 (14.5)	7 (2.3)	4 (10.0)
Other	8 (11.3)	4 (6.5)	31 (10.0)	3 (7.5)
Unknown	0 (0.0)	1 (1.6)	1 (0.3)	0 (0.0)
Total	**71**	**62**	**309**	**40**

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

Table 6.7b Number of HIV-positive individuals in care by region of origin and main transmission group, as of December 31, 2019

Region of origin	Women n (%)	Heterosexual men n (%)	MSM n (%)	Other/unknown* n (%)
The Netherlands	1,002 (29.5)	1,202 (47.8)	9,127 (69.8)	788 (45.3)
Europe, other	162 (4.8)	168 (6.7)	1,289 (9.9)	222 (12.8)
Caribbean & Latin America	510 (15.0)	358 (14.2)	1,486 (11.4)	147 (8.4)
Sub-Saharan Africa	1,429 (42.1)	657 (26.1)	193 (1.5)	422 (24.3)
Other	282 (8.3)	124 (4.9)	926 (7.1)	153 (8.8)
Unknown	8 (0.2)	8 (0.3)	53 (0.4)	8 (0.5)
Total	**3,393**	**2,517**	**13,074**	**1,740**

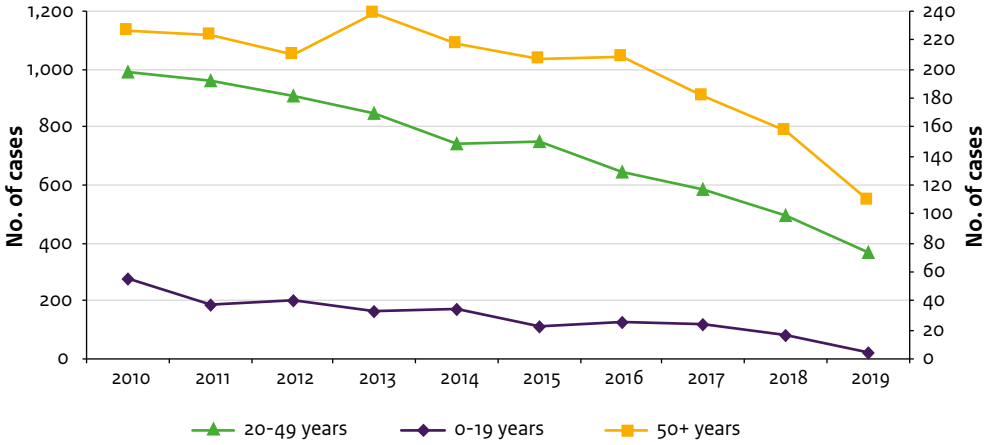
* Injecting drug use, blood and blood contacts, mother-to-child transmission, other, unknown.

Table 6.8 Number of HIV-positive individuals diagnosed in 2019 by test location and main transmission category, as of December 31, 2019

Test location	Women n (%)	Heterosexual men n (%)	MSM n (%)	Other/unknown* n (%)
PHS/SHC	3 (4.2)	3 (4.8)	118 (38.2)	6 (15.0)
Hospital	26 (36.6)	31 (50.0)	57 (18.4)	24 (60.0)
General practitioner	29 (40.8)	23 (37.1)	110 (35.6)	10 (25.0)
Pregnancy screening	11 (15.5)	0 (0.0)	0 (0.0)	0 (0.0)
Other/unknown	2 (2.8)	5 (8.1)	24 (7.8)	0 (0.0)
Total	**71**	**62**	**309**	**40**

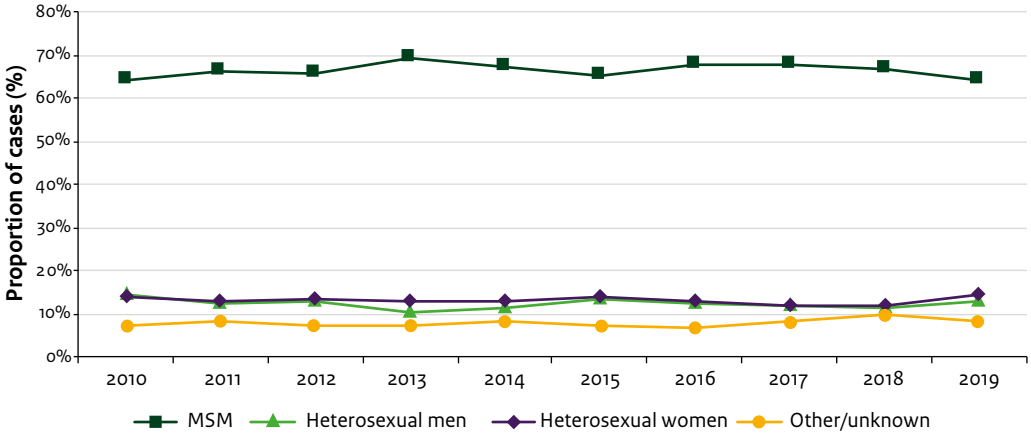
* Injecting drug use, blood and blood contacts, mother-to-child transmission, other, unknown.

Figure 6.3 Number of newly diagnosed HIV-positive individuals by age group (left axis: 20–49 years, right axis: 0–19 and 50+ years) and year of diagnosis, 2010-2019



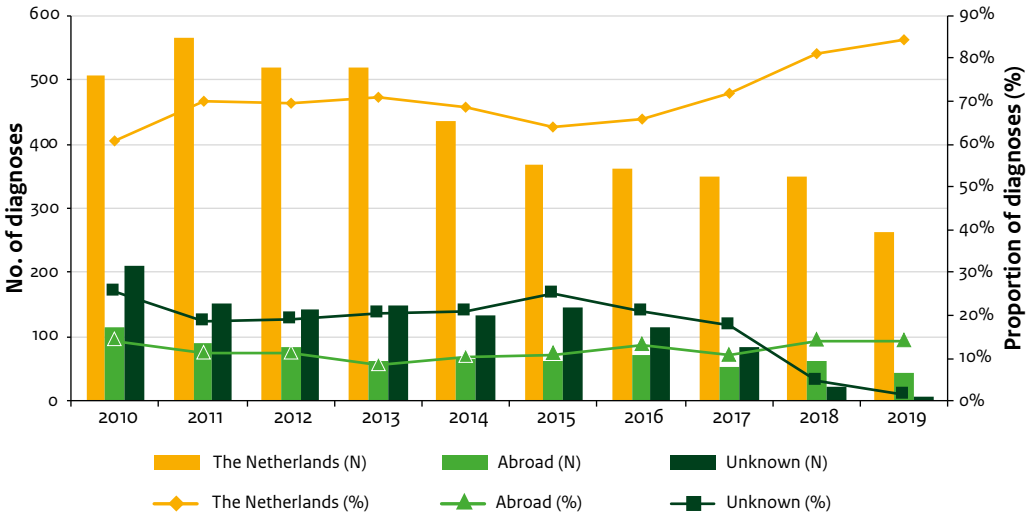
Source: Stichting HIV Monitoring, 2019 incomplete

Figure 6.4 Proportion of newly diagnosed HIV-positive individuals by main transmission group and year of diagnosis, 2010-2019



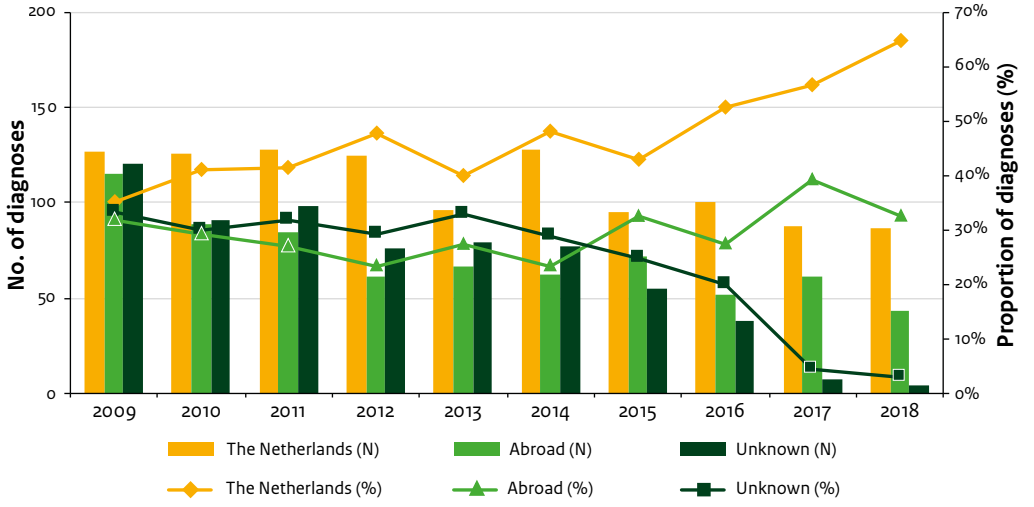
Source: Stichting HIV Monitoring, 2019 incomplete

Figure 6.5a Reported country of acquiring the HIV infection of newly diagnosed MSM by year of diagnosis, 2010-2019



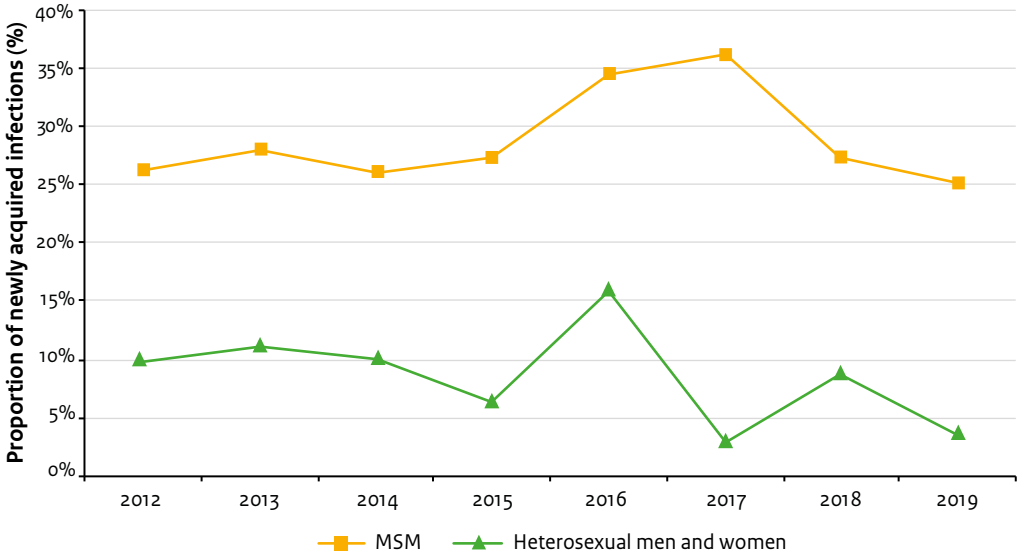
Source: Stichting HIV Monitoring, 2019 incomplete

Figure 6.5b Reported country of acquiring the HIV infection among newly diagnosed HIV-positive heterosexuals by year of diagnosis, 2010-2019



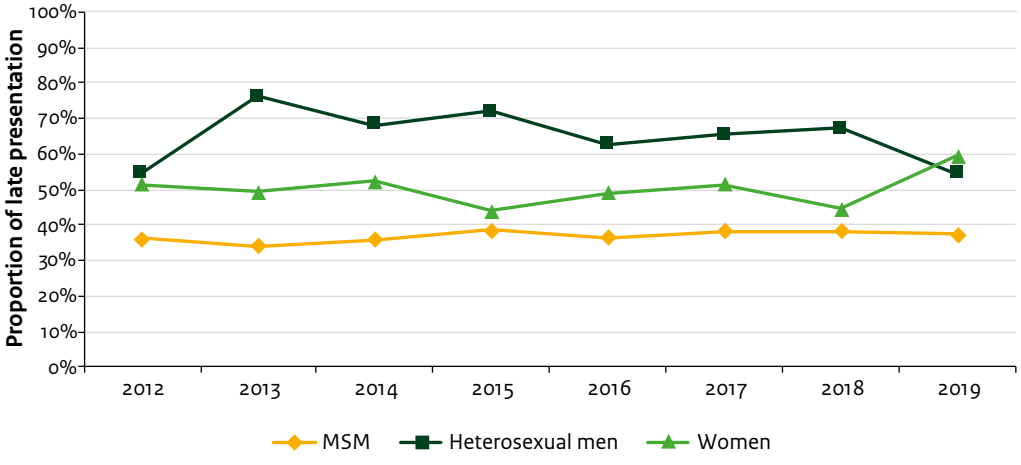
Source: Stichting HIV Monitoring, 2019 incomplete

Figure 6.6 Proportion of newly acquired HIV infections (< 6 months*) by transmission risk group, 2012-2019



Source: Stichting HIV Monitoring, 2019 incomplete
*based on history of HIV-negative test result before HIV-diagnosis

Figure 6.7 Proportion of late presentation (CD4 count <350/mm3 or AIDS at diagnosis) by transmission risk group, 2012-2019



Source: Stichting HIV Monitoring, 2019 incomplete

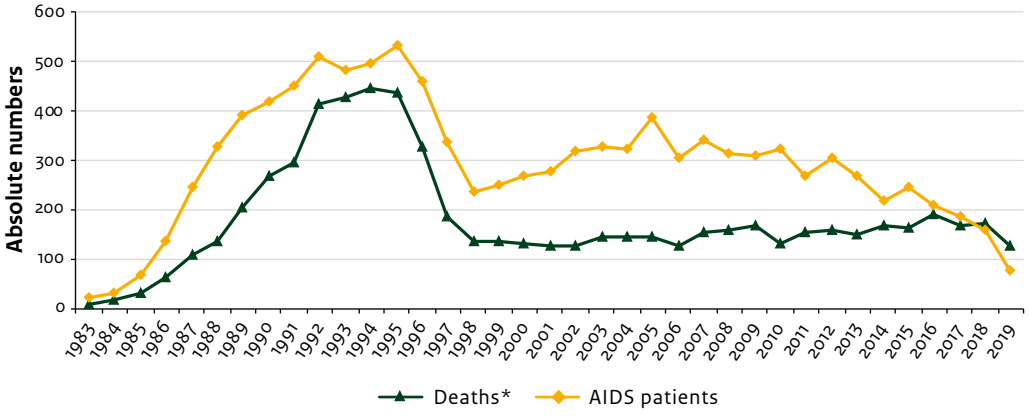
6.3.2 AIDS patients and deaths among HIV-positive individuals

Table 6.9 Number of AIDS patients by year of AIDS diagnosis and transmission risk group, 2010-2019

Year of diagnosis	Women n (%)	Heterosexual men n (%)	MSM n (%)	Other/unknown* n (%)
2010	63 (19.5)	69 (21.4)	146 (45.2)	45 (13.9)
2011	49 (18.4)	43 (16.1)	131 (49.1)	44 (16.5)
2012	52 (17.2)	57 (18.9)	152 (50.3)	41 (13.6)
2013	39 (14.6)	50 (18.7)	140 (52.4)	38 (14.2)
2014	31 (14.2)	48 (21.9)	105 (47.9)	35 (16.0)
2015	33 (13.4)	51 (20.7)	122 (49.6)	40 (16.3)
2016	37 (17.9)	42 (20.3)	96 (46.4)	32 (15.5)
2017	33 (17.7)	37 (19.9)	83 (44.6)	33 (17.7)
2018	20 (12.5)	31 (19.4)	80 (50.0)	29 (18.1)
2019	8 (10.5)	10 (13.2)	41 (53.9)	17 (22.4)

Source: Stichting HIV Monitoring, 2019 incomplete
* Injecting drug use, blood and blood contacts, mother-to-child transmission, other, unknown.

Figure 6.8 Number of AIDS patients and deaths among HIV-positive individuals, 1983-2019



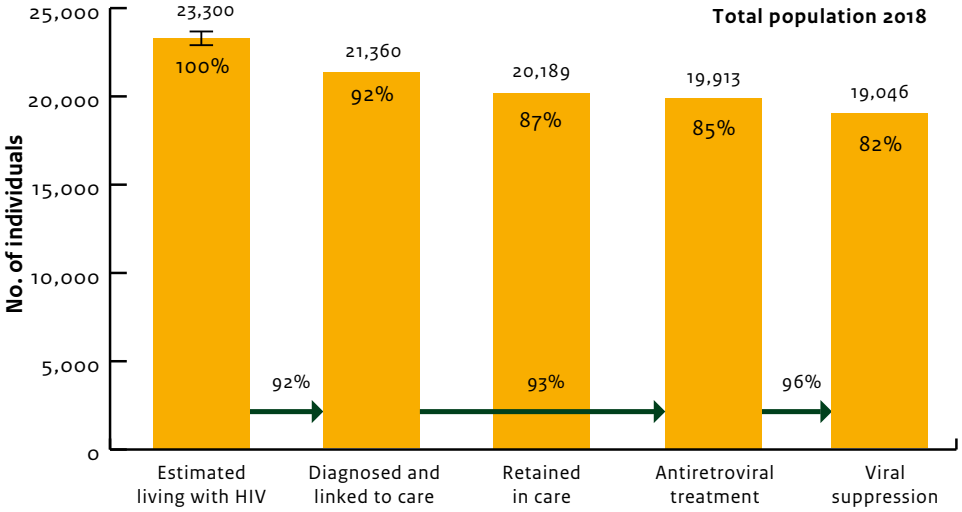
Sources: AIDS patients < 1999: AIDS registration Health Inspectorate, ≥ 1999: Stichting HIV Monitoring.
Deaths < 2002: CBS, ≥ 2002: Stichting HIV Monitoring, 2019 incomplete.
* Total deaths among HIV-positive individuals, not only caused by HIV/AIDS.

Table 6.10 Number of deaths among people with HIV/AIDS by year of death and transmission risk group, 2010-2019

Year of death	Women n (%)	Heterosexual men n (%)	MSM n (%)	Other/unknown* n (%)
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	10 (6.3)	27 (17.0)	88 (55.3)	34 (21.4)
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 (18.3)	96 (50.3)	40 (20.9)
2017	10 (5.9)	33 (19.5)	91 (53.8)	35 (20.7)
2018	12 (6.9)	23 (13.3)	105 (60.7)	33 (19.1)
2019	13 (10.2)	19 (14.8)	73 (57.0)	23 (18.0)

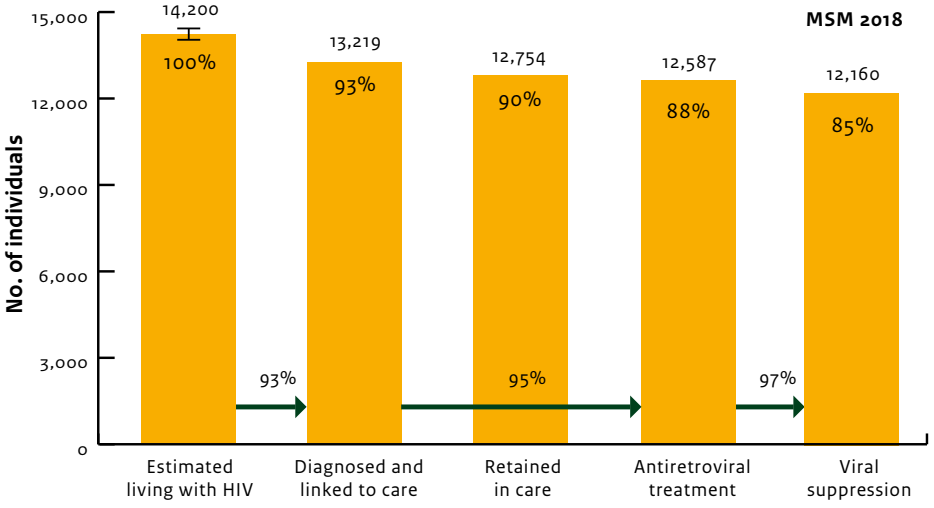
Source: Stichting HIV Monitoring, 2019 incomplete
* Injecting drug use, blood and blood contacts, mother-to-child transmission, other, unknown.
Footnote: Deaths, not only caused by HIV/AIDS.

Figure 6.9a Continuum of care for HIV in 2018, total population, Stichting HIV Monitoring



Source: Stichting HIV Monitoring, Monitoring Report 2019 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 2018, MSM, Stichting HIV Monitoring



Source: Stichting HIV Monitoring, Monitoring Report 2019 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

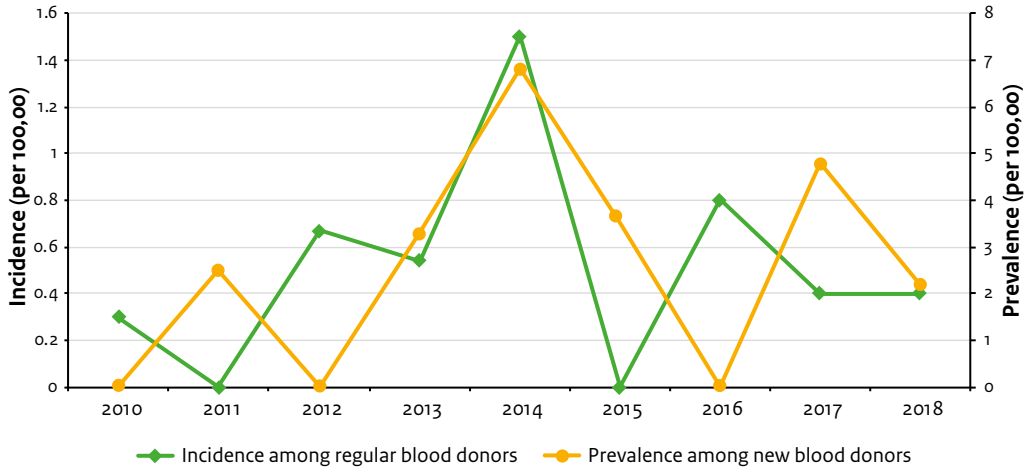
Table 6.11 HIV prevalence estimates in pregnant women, based on test results of antenatal screening, 2013–2018

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
2018	171,149	91	0.05

Sources: C.P.B. van der Ploeg (TNO), P. Oomen (RIVM), K. Vos (RIVM). Prenatale Screening Infectieziekten en Erytrocytenimmunisatie (PSIE). Procesmonitor 2018. TNO/RIVM 2020; and earlier monitors.

6.4.2 Blood donors

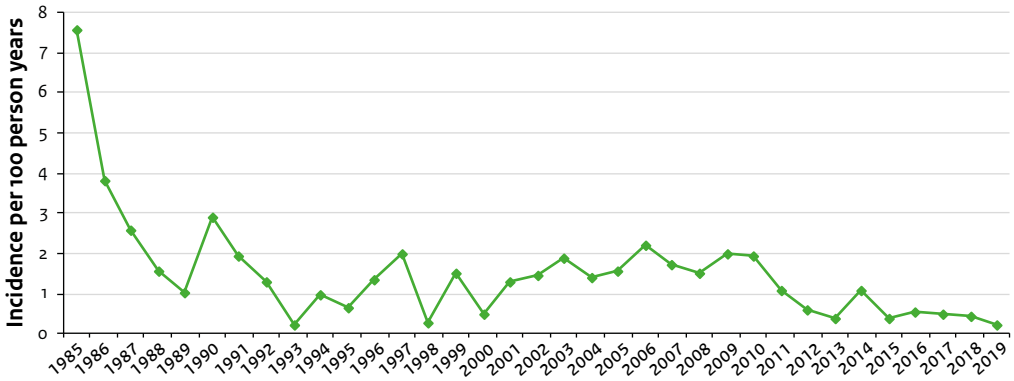
Figure 6.10 HIV incidence among regular blood donors and prevalence among new blood donors (per 100,000) in the Netherlands, 2010-2018



Source: Sanquin

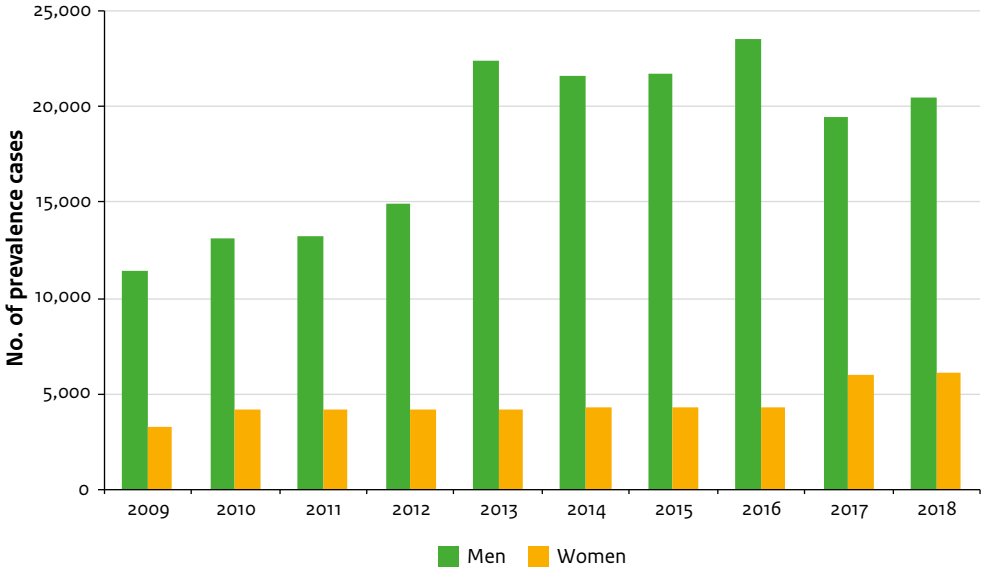
6.4.3 Amsterdam Cohort Studies

Figure 6.11 Yearly HIV incidence among MSM in Amsterdam Cohort Studies, 1985-2019



6.5 General practice

Figure 6.12 Estimated number of prevalent HIV-cases in general practice by gender, based on extrapolation from GP practices in Nivel-PCD, 2009-2018



Footnote: HIV prevalence estimates in 2011 to 2018 have been standardised for urbanisation in this report.

Table 6.12 Estimated prevalence of HIV (rate per 1,000 population) in general practice in the Netherlands by gender, based on GP practices in Nivel-PCD, 2009-2018

	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	1.6	1.1
2012	0.5	1.8	1.2
2013	0.5	2.7	1.6
2014	0.5	2.6	1.6
2015	0.5	2.6	1.5
2016	0.5	2.8	1.7
2017	0.7	2.3	1.5
2018	0.7	2.4	1.5

Footnote: HIV prevalence estimates in 2011 to 2018 have been standardised for urbanisation in this report.

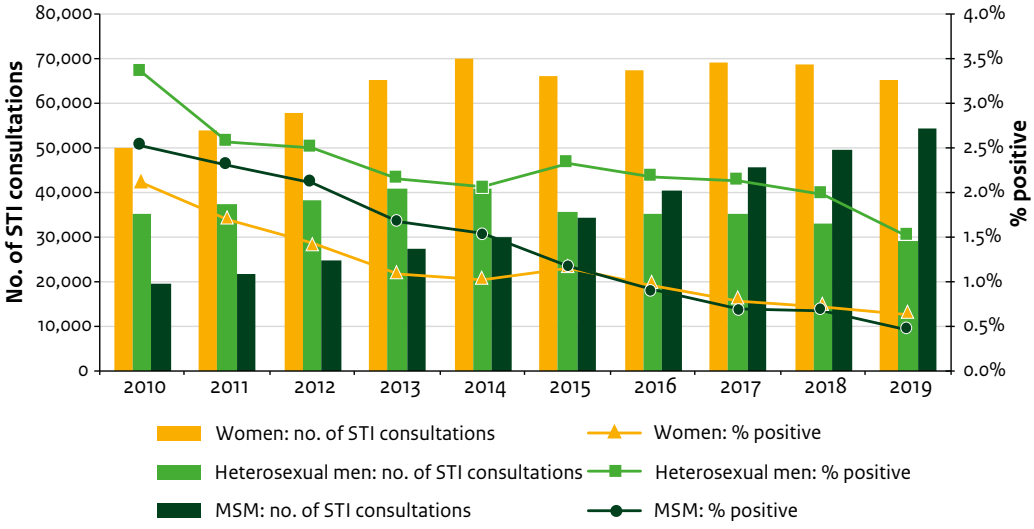
7 Genital warts

7.1 Key points

- In 2019, the number of genital warts diagnoses was 928 at the SHCs in the Netherlands; 36.9% of diagnoses were in women, 40.3% in heterosexual men, and 22.8% in MSM.
- The positivity rate was higher in heterosexual men (1.5%) than in women (0.6%) and MSM (0.5%) in 2019.
- Among women and MSM, the positivity rate has declined since 2010. Among heterosexual men, the positivity rate has been relatively stable, but declined from 2.0% in 2018 to 1.5% in 2019.
- In general practice the number of genital warts episodes, estimated from data from Nivel-PCD, was 44,700 in 2018 (compared with 42,000 in 2017), with an incidence rate of 2.6 per 1,000 population (in 2017: 2.5 per 1,000 population). The incidence rate was higher for men than it was for women (3.1 versus 2.1/1,000). Among men, the incidence rate was higher in the ≥25 age group (3.5/1,000) compared with the <25 age group (1.9/1,000).

7.2 Sexual Health Centres: characteristics, risk groups and trends

Figure 7.1 Total number of STI consultations and positivity rate of genital warts by gender and type of sexual contact, 2010-2019



Footnote: SHCs 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, 2019

Age (years)	Women		Heterosexual men		MSM	
	n positive/N	%	n positive/N	%	n positive/N	%
≤24	276/40,808	0.7	245/16,646	1.5	50/7,410	0.7
≥ 25	66/13,879	0.5	129/8,136	1.6	162/39,239	0.4
Total	**342/54,687**	**0.6**	**374/24,782**	**1.5**	**212/46,649**	**0.5**

Footnote: SHCs 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.

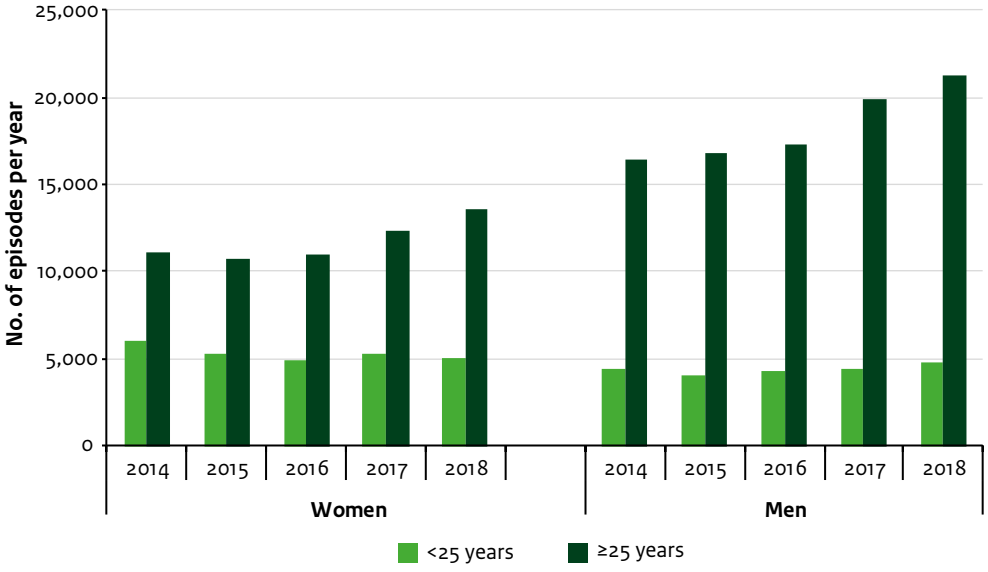
Table 7.2 Number of people diagnosed with genital warts and number of STI consultations by migration background, gender and type of sexual contact, 2019

Migration background	Women		Heterosexual men		MSM	
	n positive/N	%	n positive/N	%	n positive/N	%
Dutch	269/40,478	0.7	254/15,852	1.6	141/30,988	0.5
Other Western	35/5,544	0.6	34/2,174	1.6	28/7,065	0.4
First generation non-Western	7/3,057	0.2	21/2,512	0.8	25/5,810	0.4
Second generation non-Western	30/5,574	0.5	64/4,233	1.5	17/2,769	0.6
Total	**342/54,687**	**0.6**	**374/24,782**	**1.5**	**212/46,649**	**0.5**

Footnote: SHCs 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 7.2 Estimated annual number of episodes of genital warts in general practice by gender and age group, based on extrapolation from GP practices in Nivel-PCD, 2014-2018



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 in general practice in the Netherlands by gender and age group, based on GP practices in Nivel-PCD, 2014-2018

	Women n/1,000			Men n/1,000			Total n/1,000		
	All	**<25**	**≥25**	**All**	**<25**	**≥25**	**All**	**<25**	**≥25**
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
2018	**2.1**	2.1	2.2	**3.1**	1.9	3.5	**2.6**	2.0	2.8

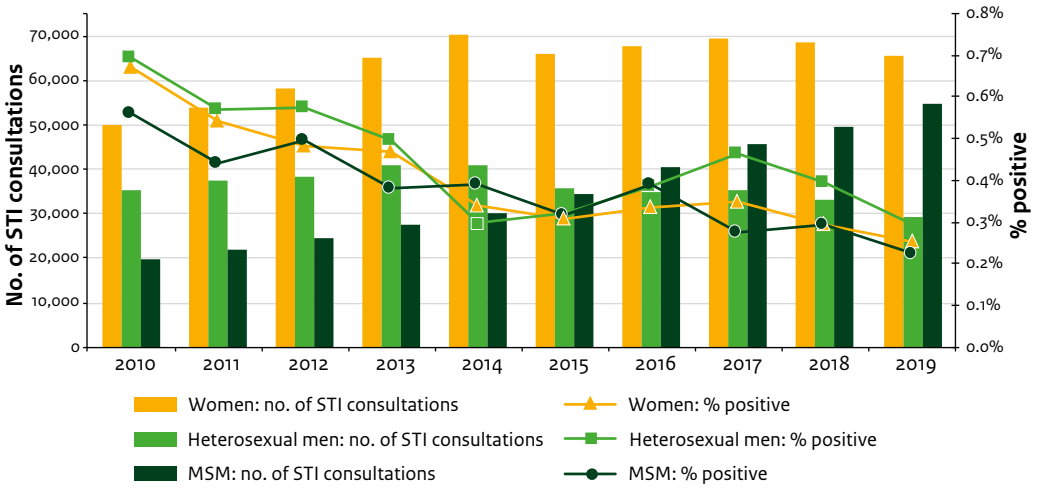
8 Genital herpes

8.1 Key points

- In 2019, there were 316 genital herpes diagnoses at the SHCs (44% in women, 33% in MSM and 23% in heterosexual men).
- The positivity rate of genital herpes in 2019 was 0.3% for women and heterosexual men, and 0.2% for MSM.
- Among women, heterosexual men and MSM, Herpes Simplex Virus 2 (HSV2) primary infection was more common than HSV1 primary infection.
- In general practice the number of genital herpes episodes, estimated from data from Nivel-PCD, was 27,950 in 2018 compared with 25,870 in 2017, with an incidence rate of 1.6 per 1,000 population (1.5 per 1,000 population in 2017). The incidence rate was higher for women than it was for men (2.4 versus 0.9/1,000). The incidence rate was also higher in the ≥25 age group compared with those aged <25.

8.2 Sexual Health Centres: characteristics, risk groups and trends

Figure 8.1 Total number of STI consultations and positivity rate of genital herpes by gender and type of sexual contact, 2010-2019



Footnote 1: SHCs 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 SHCs are included, both lab confirmed and not lab confirmed.

Table 8.1 Number of people diagnosed with genital herpes and number of STI consultations by age, gender and type of sexual contact, 2019

Age (years)	Women		Heterosexual men		MSM	
	n positive/N	%	n positive/N	%	n positive/N	%
≤ 24	93/40,808	0.2	30/16,646	0.2	17/7,410	0.2
≥ 25	46/13,879	0.3	43/8,136	0.5	87/39,239	0.2
Total	**139/54,687**	**0.3**	**73/24,782**	**0.3**	**104/46,649**	**0.2**

Footnote 1: SHCs 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 SHCs are included, both lab confirmed and not lab confirmed.

Table 8.2 Number of people diagnosed with genital herpes and number of STI consultations by migration background, gender and type of sexual contact, 2019

Migration background	Women		Heterosexual men		MSM	
	n positive/N	%	n positive/N	%	n positive/N	%
Dutch	88/40,478	0.2	32/15,852	0.2	63/30,988	0.2
Other Western	23/5,544	0.4	8/2,174	0.4	17/7,065	0.2
First generation non-Western	10/3,057	0.3	10/2,512	0.4	18/5,810	0.3
Second generation non-Western	17/5,574	0.3	23/4,233	0.5	6/2,769	0.2
Total	**139/54,687**	**0.3**	**73/24,782**	**0.3**	**104/46,649**	**0.2**

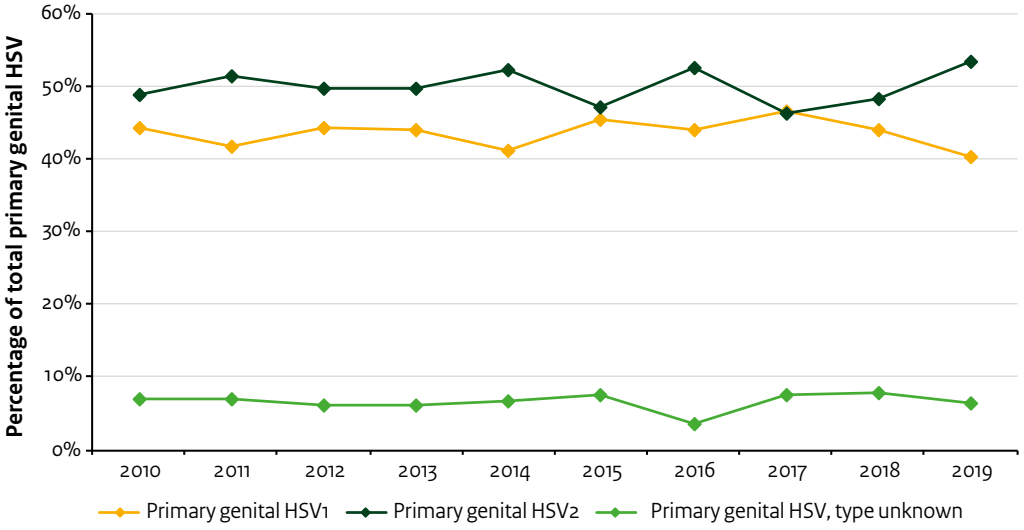
Footnote 1: SHCs test for genital herpes on indication only. Positivity rate was estimated by dividing the number of genital herpes diagnoses by the total number of registered consultations.
Footnote 2: All genital herpes diagnoses at the SHCs are included, both lab confirmed and not lab confirmed.

Table 8.3 Number and percentage of genital herpes types by gender and type of sexual contact, 2019

	Women		Heterosexual men		MSM	
	N	%	N	%	N	%
Primary HSV1	59	42.4	24	32.9	39	37.1
Primary HSV2	67	48.2	42	57.5	53	50.5
Primary HSV, type unknown*	9	6.5	5	6.8	5	4.8
Recurrent HSV	4	2.9	2	2.7	8	7.6
Total HSV	**139**		**73**		**105**	

* 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.

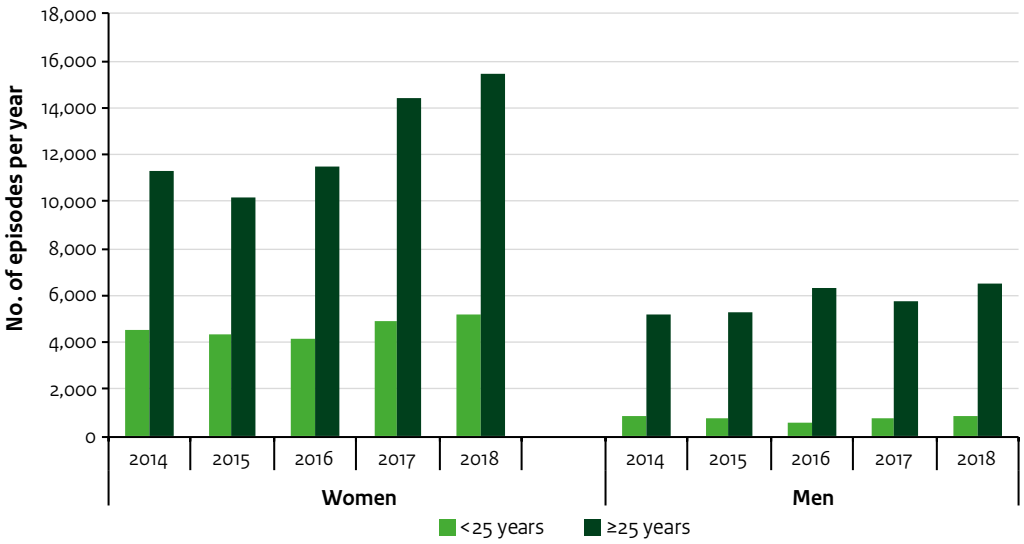
Figure 8.2 Percentage of HSV1, HSV2 and HSV type unknown of all primary genital herpes diagnoses, 2010-2019



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 8.3 Estimated annual number of episodes of genital herpes in general practice by gender and age group, based on extrapolation from GP practices in Nivel-PCD, 2014-2018



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 in general practice in the Netherlands by gender and age group, based on GP practices in Nivel-PCD, 2014-2018

	Women n/1,000			Men n/1,000			Total n/1,000		
	All	**<25**	**≥25**	**All**	**<25**	**≥25**	**All**	**<25**	**≥25**
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
2018	**2.4**	2.2	2.5	**0.9**	0.4	1.1	**1.6**	1.3	1.8

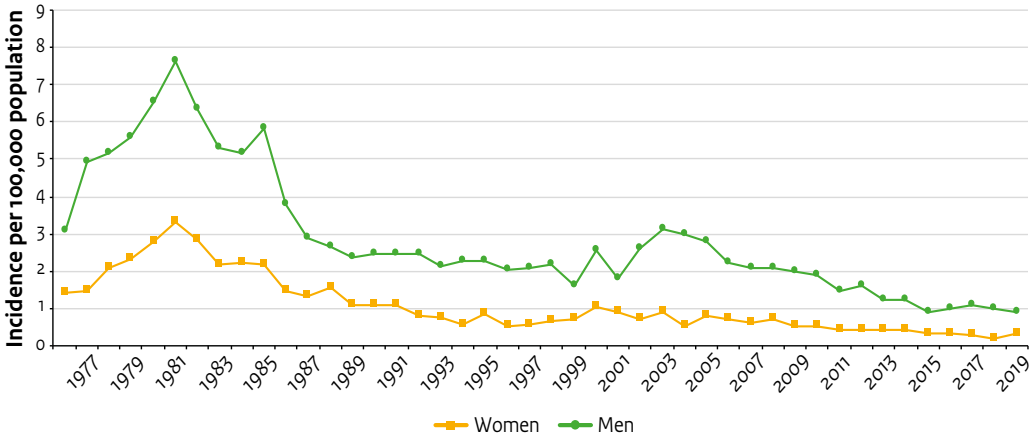
9 Hepatitis B

9.1 Key points

- In 2019, there were 108 notified cases of acute hepatitis B, comparable to 2018 (104 cases).
- The incidence of acute hepatitis B in 2019 was 0.6 cases per 100,000 inhabitants, and was higher in men (0.9 per 100,000) than it was in women (0.3 per 100,000).
- Among the notified cases, sexual contact remained the most common transmission route for acute hepatitis B (57.4%). In 32.4% of cases the route of transmission was unknown.
- At the SHCs, there were 67 cases of infectious hepatitis B (both acute and chronic) diagnoses in 2019, a decrease compared with 2018 when there were 74 cases.
- At the SHCs, 32.8% of cases were heterosexual men, 47.8% MSM and 19.4% women. Almost all heterosexual men were first generation non-Western migrants (86.4%). Among MSM most cases were Dutch (41.0%) and among women most were other Western (46.2%).
- In 2018, 453 (0.26%) women tested positive for hepatitis B in the antenatal screening programme.
- In 2019, 4,262 MSM and 808 sex workers entered the hepatitis B vaccination programme for risk groups. Over time, about two thirds of MSM and half of the sex workers entering the programme were fully vaccinated with 3 doses.

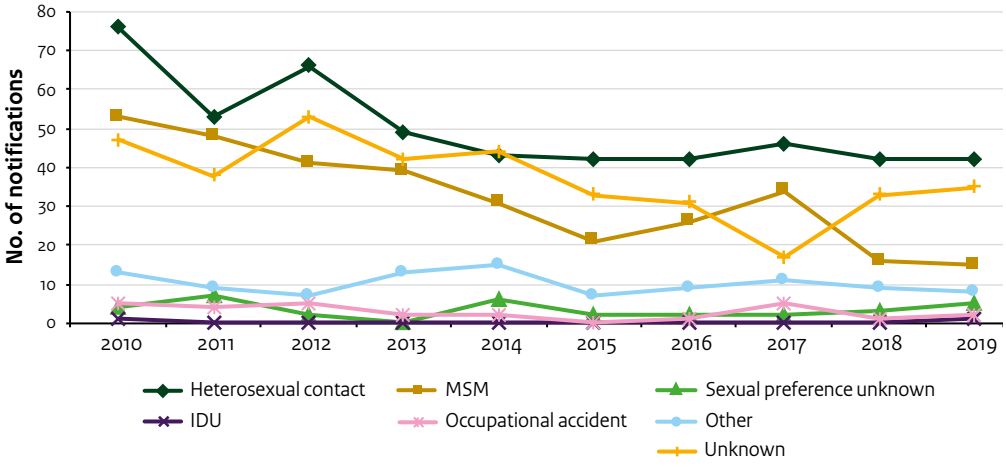
9.2 Notification data: characteristics, risk groups and trends

Figure 9.1 Incidence of acute hepatitis B per 100,000 population by gender, 1976-2019



Source: RIVM-OSIRIS, notification data
Footnote: Data of 2019 might be incomplete, because of reporting delay (data were collected on 11 March 2020)

Figure 9.2 Number of acute hepatitis B infections by route of transmission, 2010-2019



Source: RIVM-OSIRIS, notification data
Footnote: Data of 2019 might be incomplete, because of reporting delay (data were collected on 11 March 2020)

Table 9.1 Proportion of acute hepatitis B cases by most common route of transmission, the Netherlands, 2019

	Heterosexual contact (N=47) n (%)*	MSM (N=15) n (%)*	Other (N=46) n (%)*
Infected abroad	14 (29.8)	2 (13.3)	6 (13.0)
Born abroad	6 (12.8)	0 (0.0)	11 (23.9)
Infected by casual partner	28 (59.6)	14 (93.3)	
Median age (range)	37 (18-70)	54 (26-76)	49.5 (19-76)

Source: RIVM-OSIRIS, notification data
Footnote: Data of 2019 might be incomplete, because of reporting delay (data were collected on 11 March 2020)
*Proportions per category can overlap, so percentages do not add up to 100%.

9.3 Infectious hepatitis B diagnoses at the SHCs

Table 9.2 Number of hepatitis B diagnoses among persons tested for hepatitis B by age, gender and type of sexual contact, 2019

Age (years)	Women		Heterosexual men		MSM	
	n positive/N	%	n positive/N	%	n positive/N	%
≤19	1/676	0.1	2/200	1.0	0/555	0.0
20–24	3/2,276	0.1	7/1,362	0.5	6/2,169	0.3
25–29	3/1,241	0.2	2/807	0.2	5/2,043	0.2
30–34	4/602	0.7	3/483	0.6	5/1,400	0.4
35–39	1/311	0.3	3/243	1.2	3/816	0.4
40–44	1/227	0.4	4/135	3.0	3/641	0.5
45–49	0/168	0.0	1/85	1.2	1/539	0.2
50–54	0/119	0.0	0/71	0.0	1/479	0.2
≥ 55	0/89	0.0	0/91	0.0	8/707	1.1
Total	**13/5,709**	**0.2**	**22/3,477**	**0.6**	**32/9,349**	**0.3**

Footnote: Hepatitis B includes both acute and chronic cases.

Table 9.3 Number of hepatitis B diagnoses among persons tested for hepatitis B by migration background, gender and type of sexual contact, 2019

Migration background	Women		Heterosexual men		MSM	
	n positive/N	%	n positive/N	%	n positive/N	%
Dutch	1/2,321	0.0	0/1,023	0.0	13/5,238	0.2
Other Western	6/1,098	0.5	1/398	0.3	7/1,933	0.4
First generation non-Western	4/1,567	0.3	19/1,535	1.2	12/1,529	0.8
Second generation non-Western	2/695	0.3	2/513	0.4	0/637	0.0
Non-Western, unknown generation	0/28	0.0	0/8	0.0	0/12	0.0
Total	**13/5,709**	**0.2**	**22/3,477**	**0.6**	**32/9,349**	**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, 2019

Concurrent infection	Women (N=13) n (%)	Heterosexual men (N=22) n (%)	MSM (N=32) n (%)
Chlamydia	1 (7.7)	6 (27.3)	4 (12.5)
Gonorrhoea	0 (0.0)	0 (0.0)	3 (9.4)
Syphilis, infectious	0 (0.0)	0 (0.0)	4 (12.5)
HIV newly diagnosed	0 (0.0)	0 (0.0)	1 (3.1)
Genital herpes	0 (0.0)	0 (0.0)	0 (0.0)
Genital warts	0 (0.0)	0 (0.0)	0 (0.0)
Hepatitis C	0 (0.0)	0 (0.0)	0 (0.0)

Footnote 1: Hepatitis B includes both acute and chronic cases.
Footnote 2: SHCs check for genital herpes and genital warts on indication only. In addition, clients are not routinely tested on hepatitis C.

9.4 Antenatal screening

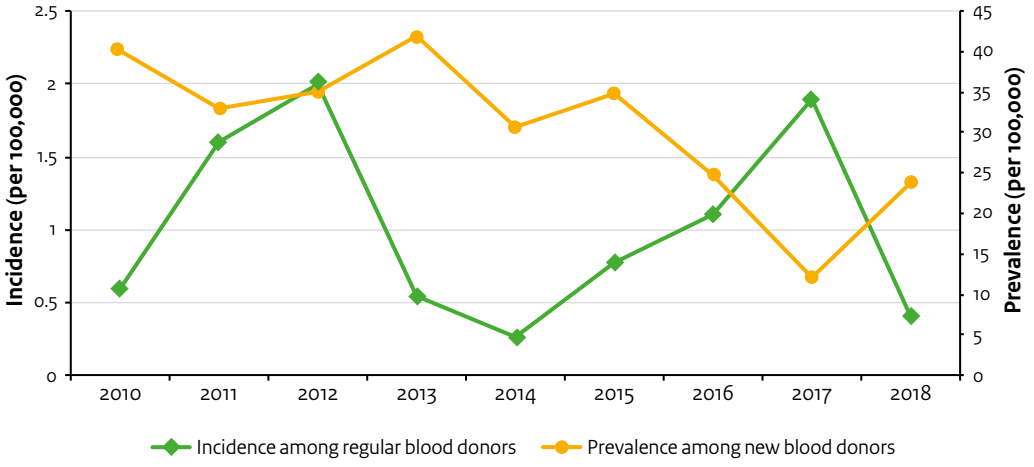
Table 9.5 Hepatitis B prevalence estimates in pregnant women, based on test results of antenatal screening, 2013-2018

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
2018	171,242	453	0.26

Sources: C.P.B. van der Ploeg (TNO), P. Oomen (RIVM), K. Vos (RIVM). Prenatale Screening Infectieziekten en Erytrocytenimmunisatie (PSIE). Procesmonitor 2018. TNO/RIVM 2020; and earlier monitors.

9.5 Blood donors

Figure 9.3 Hepatitis B incidence among regular blood donors and prevalence among new blood donors (per 100,000) in the Netherlands, 2010-2018



Source: Sanquin

9.6 Hepatitis B vaccination programme for risk groups

Figure 9.4 Number of persons entering the hepatitis B vaccination programme, 2002-2019

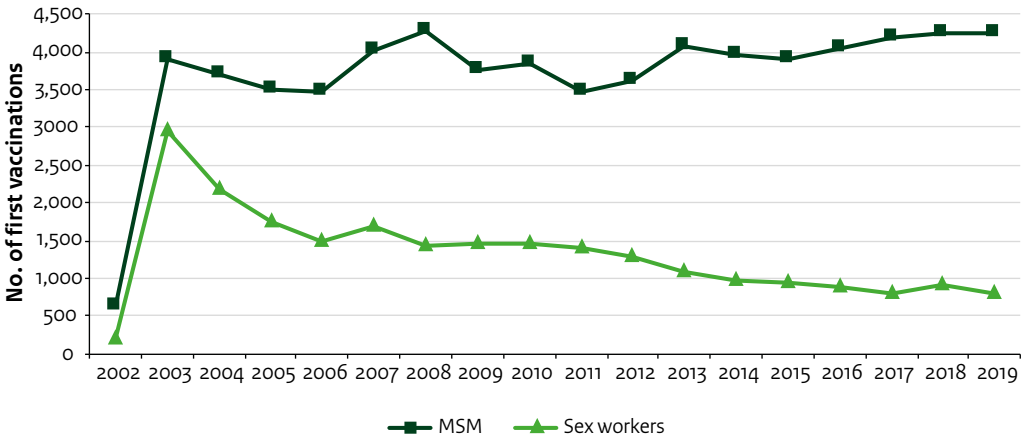


Figure 9.5 Percentage of second and third time vaccinated participants in the hepatitis B vaccination programme, 2010-2019

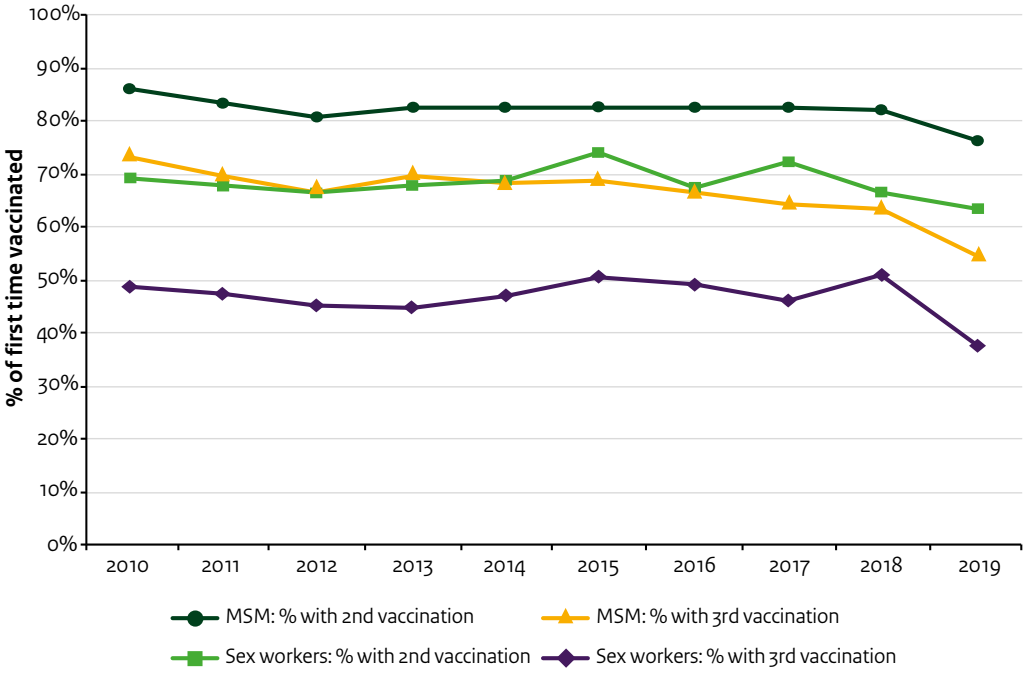


Figure 9.6 Percentage of hepatitis B chronically infected and immune participants of the hepatitis B vaccination programme, 2010-2019

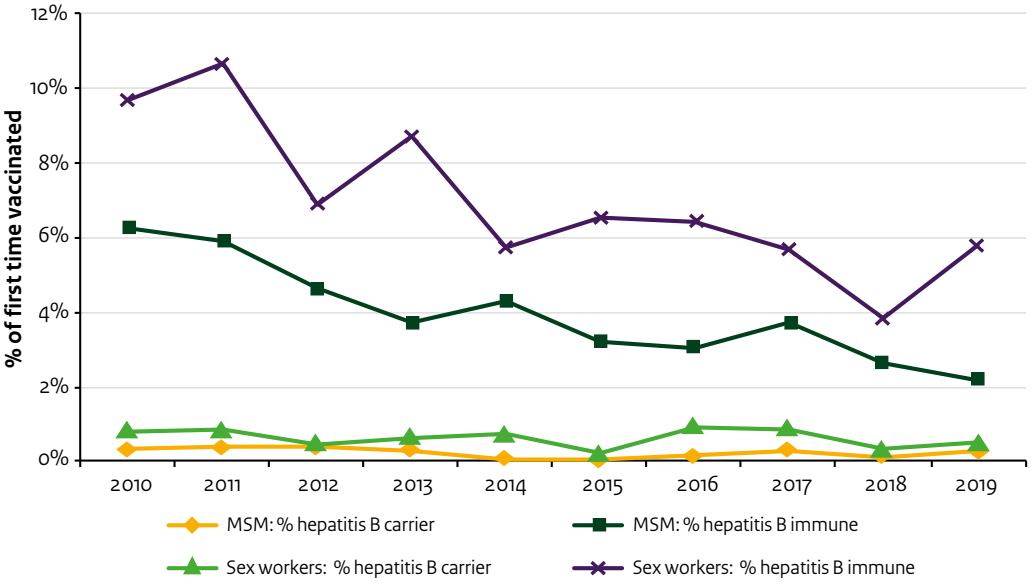
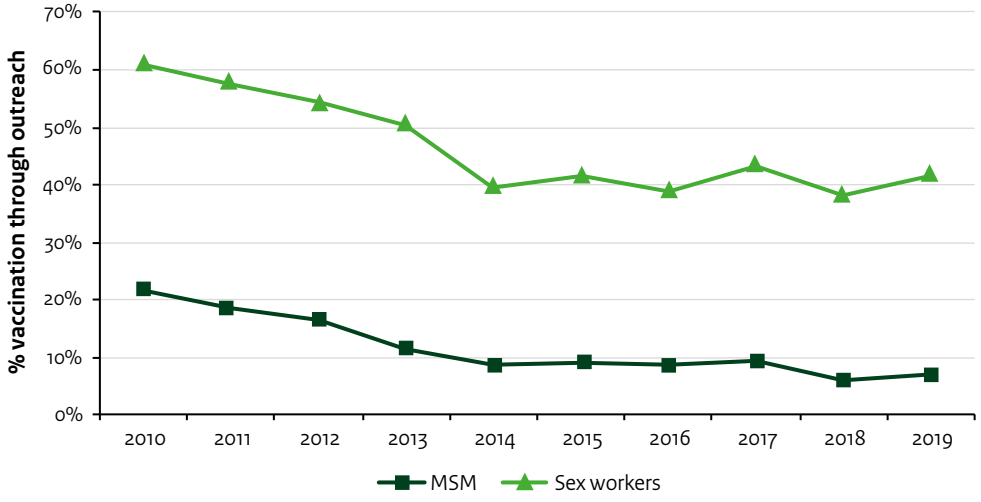


Figure 9.7 Percentage of first hepatitis B vaccinations given at outreach locations* by risk group, 2010-2019



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

10 Hepatitis C

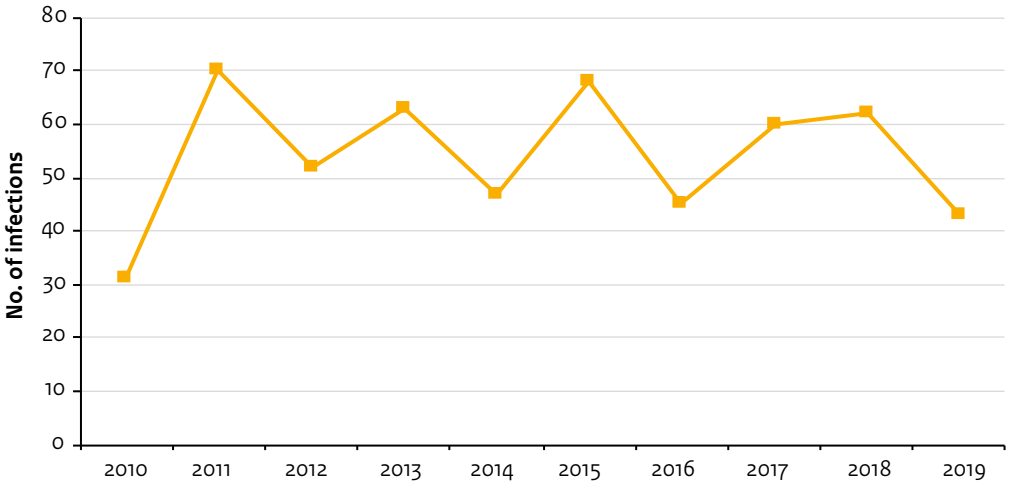
10.1 Key points

- In 2019, of all notified hepatitis C infections (669), 598 (89%) were chronic/unknown infections, 43 (7%) were acute infections, and 26 (4%) were re-infections. The number of acute hepatitis C infections (43) in 2019 was lower than it was in 2018 (62).
- Unprotected sexual contact between men remained the most commonly reported transmission route for acute hepatitis C (74%).
- Of all acute hepatitis C infections among MSM in 2019 (32), 19 were among HIV-infected MSM (59%).
- Of the 598 chronic/unknown infections, 192 (32%) were identified among injecting drug users (IDUs), 42 (7%) among MSM, 6 (1%) among heterosexuals, 4 (0.7%) among people with unknown sexual risk, and 354 (59%) involved other/unknown risks.
- Of the chronic/unknown hepatitis C infections among MSM in 2019 (42), 15 were among HIV-infected MSM (36%).
- Of the 26 re-infections, 17 (65%) were identified among MSM. Among them, 15 (88%) were HIV-infected.

- At the SHCs, 6,594 persons were tested for hepatitis C, 6,507 (98.7%) of whom were MSM.
- Among MSM tested for hepatitis C, 1,097 (16.9%) were known or new HIV-positive and 5,410 (83.1%) were HIV-negative.
- Of the consultations among HIV-negative MSM tested for HCV, 1,140 were regular or test-lab consultations among MSM who had not used PrEP in the past 3 months, 1,861 were regular or test-lab consultations with MSM who used PrEP in the past 3 months and 2,409 were PrEP consultations.
- 56 hepatitis C infections were diagnosed at the SHCs; all in MSM (31 among HIV-negative MSM, of which 19 among MSM who had used PrEP in the past 3 months) and 25 were among known or new HIV-positive MSM.

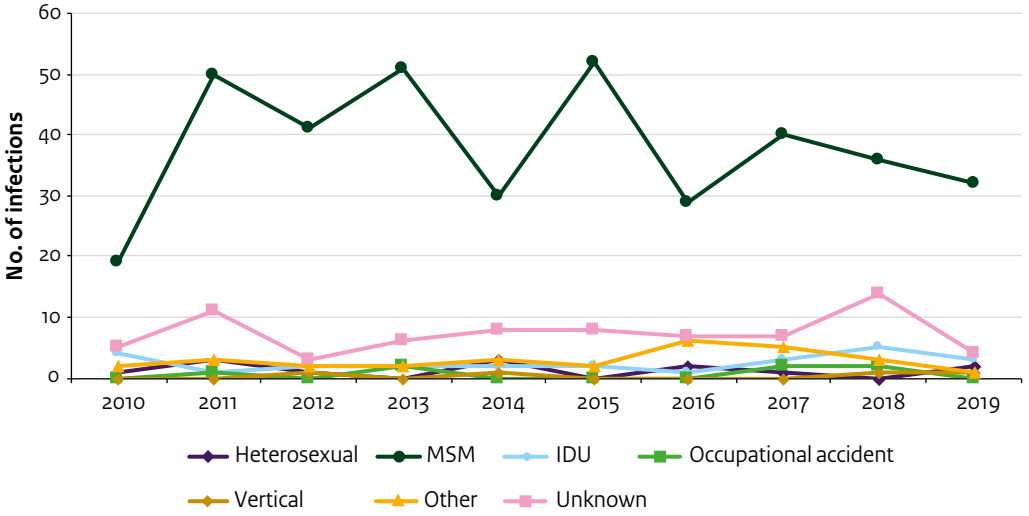
10.2 Notification data: characteristics, risk groups and trends

Figure 10.1 Number of acute hepatitis C infections, 2010-2019



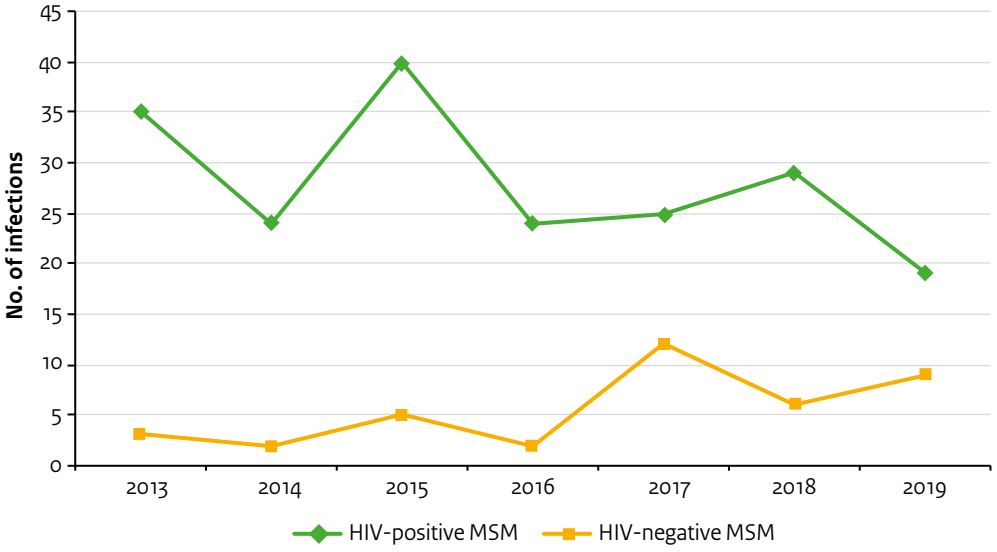
Source: RIVM-OSIRIS, notification data
Footnote: Data of 2019 might be incomplete, because of reporting delay (data were collected on 3 April 2020).

Figure 10.2 Number of acute hepatitis C infections by route of transmission, 2010-2019



Source: RIVM-OSIRIS, notification data
Footnote: Data of 2019 might be incomplete, because of reporting delay (data were collected on 3 April 2020).

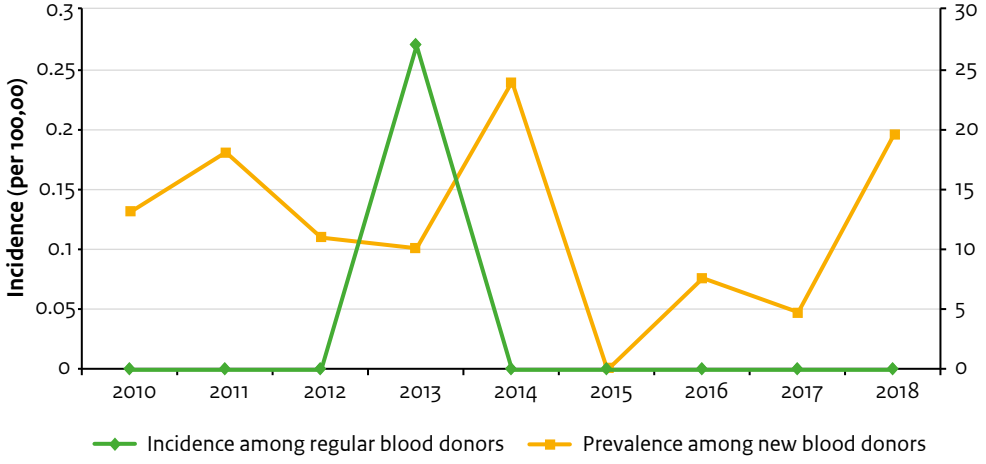
Figure 10.3 Number of acute hepatitis C infections in MSM by HIV status, 2013-2019



Source: RIVM-OSIRIS, notification data
Footnote: Data of 2019 might be incomplete, because of reporting delay (data were collected on 3 April 2020).

10.3 Blood donors

Figure 10.4 Hepatitis C incidence among regular blood donors and prevalence among new blood donors (per 100,000) in the Netherlands, 2010-2018



Source: Sanquin

11 Conclusions and recommendations

The total number of consultations (150,782) at SHCs remained fairly stable in 2019 compared with 2018 (152,217 consultations), whereas the percentage of people with a positive STI test slightly increased (19.0% in 2019 and 18.2% in 2018). The number of consultations increased among MSM, but decreased among heterosexual men and women. Following the implementation of the GDPR, 16% of the clients did not consent to share data with the RIVM for national surveillance purposes in 2019. Aggregated anonymous data (numbers of STI tests and diagnoses by gender and type of 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 (126,629 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 and the percentage of non-registered consultations were equal between categories of gender, sexual preference and age.
The total estimated number of STI-related episodes recorded in general practice is more than twice that reported at SHCs, with an estimated 334,700 episodes in 2018, an increase compared with earlier years (307,400 episodes in 2017 and 281,300 episodes in 2016). This increase was observed among all age groups and among both men and women and might be related to the fixed test capacity at SHCs. However, data from the Healthy Survey showed that in 2018, 13% of women aged 16-29, 7% of heterosexual men aged 16-29, and 24% of MSM aged 16-44 reported STI testing in the past year, comparable to earlier estimates of the Health Survey and other national surveys.[15] Unfortunately, there are no data sources available for an estimation of the number of tests purchased online with corresponding numbers of STI diagnoses. Regional laboratory surveillance in combination with general practice and SHC surveillance can provide insight into the regional STI epidemiology and the contribution of testing facilities.[16]

Consultation rates and STI positivity rates varied across the PHS regions in the Netherlands, which can (at least partially) be explained by differences in SHC attendee characteristics, including educational level, age and the percentage of attendees who were notified or had STI symptoms. Overall, there has been a shift towards more consultations among MSM because of

[15] Heijne JCM, van Aar F, Meijer S, de Graaf H, van Benthem BHB. Placing sexually transmitted infection surveillance data in perspective by using national probability sample surveys. Eur J Public Health. 2020 Feb 1;30(1):124-131. doi: 10.1093/eurpub/ckz157

[16] Slurink I, Groen K, Gotz HM, Meima A, Kroone MM, Hogewoning AA, Ott A, Niessen W, Dukers-Muijers N, Hoebe C, Koedijk F, Kampman C, van Bergen J. Contribution of general practitioners and sexual health centres to sexually transmitted infection consultations in five Dutch regions using laboratory data of *Chlamydia trachomatis* testing. Int J STD AIDS. 2020 May;31(6):517-525. doi: 10.1177/0956462420905275.

the PrEP pilot programme that requires trimonthly consultations, leaving less time for youngsters at the clinics and through outreach. Groups that were at high risk of STI, as reflected in their high positivity rates, were those who reported being notified for an STI, those having STI related symptoms, MSM who were previously diagnosed with HIV or people with a reported history of STI in the past year. Risk behaviours among MSM that corresponded with high STI positivity rates were group sex and drug use in relation to sex.[17]

Since July 2019, a national PrEP pilot programme has been implemented in the Netherlands at the SHCs. By 31 December 2019, 2,797 individuals (98% MSM) had a first PrEP consultation in the PrEP pilot programme. The majority of persons entering the PrEP pilot had already used PrEP in the three months previous to their first consultation (56%). At follow-up consultation the majority reported daily PrEP use in the past 3 months (57%), 39% reported event-driven PrEP use and 3% reported a combination of both. This finding shows that it is important to provide a choice in the PrEP regimen. Risky sexual behaviours, such as a high number of partners, inconsistent condom use for receptive anal sex, group sex and drug use in the context of sex, were more frequently reported by MSM who reported to have used PrEP in the 3 months prior to consultation compared with HIV-negative MSM who reported no PrEP use. In addition, STI rates were higher among MSM who used PrEP than they were among those who did not. These findings suggest that the SHCs are doing well in reaching the PrEP target group in the first 6 months of the pilot programme. Monitoring the effects of PrEP on the incidence of HIV, STI and changes in sexual behaviour is important, however because of limited follow-up time not yet reported.

Only 23% 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 SHCs, it also indicates unprotected sexual contact is ongoing. Continuing prevention efforts, such as promotion of condom use as well as active case finding by testing and treatment strategies, need to be optimised to increase the effect of control efforts. Reaching those most vulnerable and in need of care remains a challenge we have to tackle.

Chlamydia remains the most commonly diagnosed bacterial STI, both among women and heterosexual men at the SHCs and among people tested at GP practices. In SHCs, the positivity rate of chlamydia in women and heterosexual men increased up to 2016 but has remained stable since then. Positivity rates among MSM have been stable since 2010. In general practice the estimated number of chlamydia episodes increased compared with the previous years. Surveillance of chlamydia in general practice is hampered by the lack of a specific ICPC main code for chlamydia. Since chlamydia diagnoses and prevalence rates remained stable despite all prevention efforts, it might be time to reconsider chlamydia control. To define a novel chlamydia control strategy for the Netherlands, an (inter)national expert meeting took place in

[17] 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. Sex Transm Infect. 2020 Feb;96(1):33-39. doi: 10.1136/sextrans-2019-053977.

November 2019 to discuss the way forward in chlamydia control. Based on the discussion during this meeting and scientific literature, this strategy will be formulated also as part of the National action plan on STIs, HIV and Sexual Health for 2017-2022. Lymphogranuloma venereum (LGV, the L2 strain of chlamydia leading to serious symptoms and complications) among MSM remains uncommon, but the number of cases increased from 72 in 2010 to 419 at SHCs in 2019, and the positivity rate slightly increased over time. The increased number of LGV infections could be, at least partially, explained by increased numbers of consultations over time and a changed testing policy from selective to universal rectal chlamydia and LGV testing regardless HIV status or symptoms. Notably, the proportion of HIV-negative MSM and asymptomatic cases among all LGV cases, increased from approximately 20% to 30% in 2010 to almost 60%. However, the changes in the testing policy may have led to incomparable positivity rates over time. In addition, it is difficult to disentangle the effects of increased testing and changes in LGV incidence.[18] Nevertheless, these results confirm the importance of universal rectal chlamydia and LGV testing among MSM. Rectal chlamydia infections in MSM are also an indication for LGV testing at general practice. However, the percentage of anal testing in general practice is very low. Consequently, LGV infections may be missed.

Infections with gonorrhoea mainly occur in MSM. The positivity rates slightly increased in heterosexual men and in women. Among MSM, the positivity rate of gonorrhoea was higher than the chlamydia positivity rate. The incidence rate of gonorrhoea among men and women in the GP surveillance increased compared with previous years, especially among women under 25, which needs further investigation. 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 SHCs in the Netherlands. The increasing trend in gonorrhoea positivity rates and a shifting distribution towards less susceptible MIC values for azithromycin and ceftriaxone, combined with large regional differences, underscore the importance of resistance surveillance.[19]

For syphilis, the number of diagnoses has increased compared with 2018. Positivity rates have remained stable among HIV-negative MSM, but have fluctuated among HIV-positive MSM. Positivity rates among heterosexuals remain low. The low rates of syphilis infections among women are encouraging 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.[20] It is therefore important to

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18 van Aar F, Kroone MM, de Vries HJC, Götz HM, van Benthem BHB. Increasing trends of lymphogranuloma venereum among HIV-negative and asymptomatic men who have sex with men, the Netherlands, 2011 to 2017. Eurosurveillance 25, 1900377 (2020); *http://dx.doi.org/10.2807/1560-7917.ES.2020.25.14.1900377*

19 Götz HM, van Oeffelen LA, Hoebe CJPA, van Benthem BH. Regional differences in chlamydia and gonorrhoeae positivity rate among heterosexual STI clinic visitors in the Netherlands: contribution of client and regional characteristics as assessed by cross-sectional surveillance data. BMJ Open. 2019 Jan 21;9(1):e022793. doi: 10.1136/bmjopen-2018-022793.

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

carefully monitor syphilis cases in heterosexuals, while at the same time ensuring that syphilis screening programmes are implemented effectively, as is the case in the Netherlands.[21]

Two thirds of all new HIV diagnoses in the Netherlands occur among MSM. The HIV positivity rate among MSM testing at SHCs has been declining for years and this decline was even stronger in 2019 compared with earlier years. At SHCs, 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. Data from SHM showed that more than 50 percent of heterosexuals are diagnosed late (CD4<350/mm3 or AIDS), especially those diagnosed at GP practices or in hospitals. For MSM, this figure was 37 per cent. However, the trend in the proportion of late diagnosis should be interpreted with caution and in the context of the trend in HIV incidence. A decreasing HIV incidence could lead to a higher proportion of late diagnoses. The 90-90-90 goals as set by UNAIDS for 2020 (90% diagnosed, of whom 90% received antiretroviral therapy, of whom 90% have an undetectable viral load) are met. For the Netherlands as a whole, these goals were already achieved in 2018 (92-93-96, with 93-95-97 for MSM). To increase the percentage of diagnosed HIV-positive individuals and to prevent new HIV infections, a multi-sectorial approach continues to be needed, such as PrEP, (peer-led) community-based testing[22], pro-active testing by GPs, HIV-partner notification and primary prevention by behavioural interventions focusing on increased condom use, and rapid linkage to HIV care and treatment. Peer support and psychological support are essential as self-stigma and stigma in the community and among health care professionals remains a barrier to testing, disclosure and starting treatment. Interventions to reduce stigma, and especially HIV stigma, are to be strengthened.

The number of acute hepatitis B notifications was similar to 2018 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. There were 598 chronic/unknown HCV notifications in 2019. 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 this reason, SHM is piloting the registration of hepatitis C infections in several hospitals.

National real-time data from SHCs, in addition to local alerts, can provide early warning of

[21] 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.

[22] Op de Coul E, den Daas C, Spijker R, Heijman T, de Vos M, Götz H, Vermey K, Zuilhof W, Van den Boogaard J, Davidovich U, Zuure F; PREVENT Collaborators. Web-Supported Social Network Testing for HIV Among Men Who Have Sex With Men With a Migration Background: Protocol for a Mixed Methods Pilot Study. JMIR Res Protoc. 2020 Feb 9;9(2):e14743. doi: 10.2196/14743.

outbreaks of STI in certain high-risk groups or regions. In 2019, one local alert on increased LGV among MSM was reported in the weekly infectious disease signal report. Furthermore, in 2019 a Finnish variant of chlamydia was discovered which escaped detection from a specific but commonly used PCR. Investigation by the national reference laboratory for chlamydia confirmed the introduction of this variant in the Netherlands, but only on a very small scale. Therefore, no further additional testing for this variant has been requested.

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 was accepted by the Ministry of Health, Welfare and Sport. 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 with 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, several goals are not on track, with the exception of those for HIV. The goals for a decline in syphilis and gonorrhoea diagnoses are highly dependent on testing strategies, infectiousness and re-infections and are less suitable as indicators for improvements in STI control and will not be met. To be able to progress the goals formulated in the national action plan, 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.
- Evaluate the occurrence of HIV, STI and changes in sexual behaviour among PrEP users.
- Maintain integrated surveillance of STIs and STI risks among high-risk groups and keep track of the general population by regular population surveys.
- More focus on outreach programmes to reach persons with a low level of education, adolescents, sex workers and transgenders.
- Stimulate the systematic culturing of *Neisseria gonorrhoea* or innovative ways to measure resistance in order to prevent the transmission of pan-drug resistant strains.
- Develop key indicators to be able to monitor the efforts made in the prevention of syphilis and gonorrhoea (instead of the focus on number of diagnoses).

At the moment of writing of these conclusions and recommendations of the STI year report, the COVID-19 pandemic is ongoing. Due to the pandemic, STI care and testing at the SHCs has been drastically diminished, as is the provision of PrEP. Therefore, it will be extremely important to investigate the impact of the pandemic and the measures taken, such as social distancing on all kinds of aspects of STI care, including changes in sexual behaviour, STI treatment seeking behaviour, the occurrence of STI and the uptake of PrEP in the coming year(s).

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
CVPZ	Centrum Voeding, Preventie en Zorg, Centre for Nutrition, Prevention and Health Services
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
IDU	Injecting Drug User
IgM	Immunoglobulin M
IDS	Laboratory for Infectious Disease and Screening
LCI	Landelijke Coördinatie Infectieziektebestrijding, National Coordination Centre for Communicable Disease Control
LGV	Lymfogranuloma venereum, Lymphogranuloma venereum
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
PCR	Polymerase Chain Reaction
PHS	Public Health Service
PID	Pelvic Inflammatory Disease
PrEP	Pre-Expositie Profylaxe, Pre-Exposure Prophylaxis
RIVM	Rijksinstituut voor Volksgezondheid en Milieu, National Institute for Public Health and the Environment
SANL	Soa Aids Nederland, STI AIDS Netherlands
SHC	Sexual Health Centre
SHM	Stichting HIV Monitoring, HIV Monitoring Foundation
soa	Seksueel Overdraagbare Aandoeningen
SOAP	Online STI registration system

STI	Sexually Transmitted Infection
SW	Sex Worker
TNO	Nederlandse Organisatie voor toegepast-natuurwetenschappelijk onderzoek
UNAIDS	Joint United Nations Programme on HIV/AIDS
WHO	World Health Organisation

Appendix B STI case-definitions of Sexual Health Centres

Chlamydia trachomatis (Ct)
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 SHCs

GGD Amsterdam	E. Hoornenborg
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	I. Peters
GGD Zuid Limburg	C.J.P.A. Hoebe
	M. Steenbakkers

Regional SHCs

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

Streeklaboratorium voor de Volksgezondheid Amsterdam
Maastricht Universitair Medisch Centrum (MUMC)
Albert Schweitzer Ziekenhuis Dordrecht
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 en Immunologie Tilburg, Elisabeth-TweeSteden Ziekenhuis
Leiden Universitair Medisch Centrum
Meander Medisch Centrum Amersfoort
Medisch Centrum Alkmaar
Reinier Haga Medisch Diagnostisch Centrum
Star-SHL Etten-Leur/Rotterdam (GGD Zeeland en West-Brabant)
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)
Zaans Medisch Centrum Zaandam
Ziekenhuis Gelderse Vallei Ede
Ziekenhuis Rivierenland

Appendix D Stichting HIV Monitoring

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. Weijsenfeld.
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, R.S. Autar, 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.

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. Weijsenfeld.

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: A. Buiting, A. Reuwer, J. Veenemans, B. Wintermans.

Catharina Ziekenhuis, Eindhoven
HIV treating physicians: M.J.H. Pronk*, H.S.M. Ammerlaan.
HIV nurse consultants: D.N.J. van den Bersselaar, E.S. de Munnik.
HIV clinical virologists/chemists: B. Deiman, A.R. Jansz, V. Scharnhorst, J. Tjhie, M.C.A. Wegdam.

DC Klinieken Lairesse - Hiv Focus Centrum
HIV treating physicians: A. van Eeden*, J. Nellen, M. van der Valk.
HIV nurse consultants: W. Brokking, L.J.M. Elsenburg, H. Nobel.
HIV clinical virologists/chemists: C.J. Schinkel.

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, R. van Erve, B.A.F.M. de Kruijf-van de Wiel, S. Keelan-Phaf, 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.

Erasmus MC, Rotterdam
HIV treating physicians: T.E.M.S. de Vries-Sluijs*, H.I. Bax, E.C.M. van Gorp, N.C. de Jong-Peltenburg, M. de Mendonça Melo, E. van Nood, J.L. Nouwen, B.J.A. Rijnders, C. Rokx, C.A.M. Schurink, , L. Slobbe, A. Verbon.
HIV nurse consultants: N. Bassant, J.E.A. van Beek, M. Vriesde, L.M. van Zonneveld.
Data collection: 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: A.S. Cents-Bosma, 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, C. Tearno, 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 Bliek, P.C.J. Bor.
HIV clinical virologists/chemists: S.B. Debast, G.H.J. Wagenvoort.

Leids Universitair Medisch Centrum, Leiden
HIV treating physicians: F.P. Kroon*, M.G.J. de Boer, H. Jolink, M.M.C. Lambregts, A.H.E. Roukens, H. Scheper.
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*, R. El Moussaoui, K. Pogany.
HIV nurse consultants: C.J. Brouwer, J.V. Smit, D. Struik-Kalkman.
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, M.E. van Wolfswinkel.
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.

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: A. Al Moujahid.

Medisch Spectrum Twente, Enschede
HIV treating physicians: G.J. Kootstra*, C.E. Delsing.
HIV nurse consultants: M. van der Burg-van de Plas, L. Scheiberlich.

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, K.D. Lettinga, M. de Regt, W.E.M. Schouten, J.E. Stalenhoef, J. Veenstra, S.M.E. Vrouenraets.
HIV nurse consultants: H. Blaauw, G.F. Geerders, M.J. Kleene, M. Kok, M. Knapen, I.B. van der Meché, E. Mulder-Seeleman, A.J.M. Toonen, S. Wijnands, E. Wttewaal.
HIV clinical virologists: D. Kwa.

Radboudumc, Nijmegen
HIV treating physicians: R. van Crevel*, K. van Aerde, A.S.M. Dofferhoff, S.S.V. Henriet, 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.
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Appendix E Nivel Primary Care Database (Nivel-PCD)

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Project management
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Appendix F STI publications (co-)authored by RIVM employees 2019

A Multidimensional Approach to Assessing Infectious Disease Risk: Identifying Risk Classes Based on Psychological Characteristics. van Wees DA, Heijne JCM, Heijman T, Kampman KCJG, Westra K, de Vries A, de Wit J, Kretzschmar MEE, den Daas C. Am J Epidemiol. 2019 Sep 1;188(9):1705-1712. doi: 10.1093/aje/kwz140

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