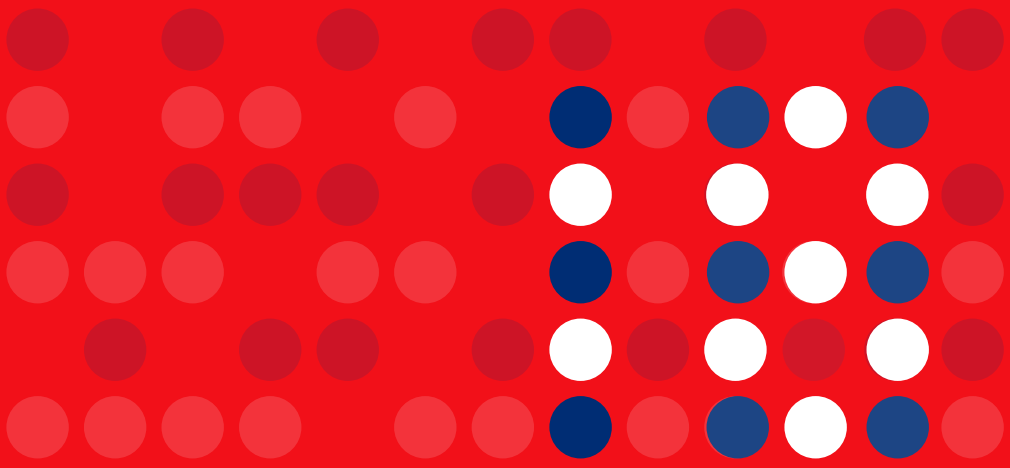
Human Immunodeficiency Virus (HIV)
infection in the Netherlands

HIV Monitoring Report 2018

Chapter 1: The HIV epidemic in the Netherlands



About Stichting HIV Monitoring

Stichting HIV Monitoring (SHM), the Dutch HIV monitoring foundation, was founded in 2001 and appointed by the Dutch minister of Health, Welfare and Sport as the executive organisation for the registration and monitoring of HIV-positive individuals in the Netherlands.

SHM comprehensively maps the HIV epidemic and HIV treatment outcomes in the Netherlands, thereby contributing to the knowledge of HIV. In collaboration with the HIV treatment centres in the Netherlands, SHM has developed a framework for systematically collecting HIV data for the long-term follow up of all registered individuals. The Netherlands is the only country in the world to have such a framework, which enables healthcare professionals to aspire to the highest standard of HIV care.

In addition to national reports, healthcare professionals are provided with treatment centre-specific reports to enable them to monitor and optimise care provided in their centres. Moreover, upon request, SHM data are also made available for use in HIV-related research, both in the Netherlands and internationally. The outcome of SHM's research and international collaborations provides tangible input into policy guidelines and further improves HIV care in the Netherlands.

Our mission

To further the knowledge and understanding of all relevant aspects of HIV infection, including comorbidities and co-infections (such as viral hepatitis), in HIV-positive persons in care in the Netherlands.

HIV Monitoring

Monitoring Report 2018

Human Immunodeficiency Virus (HIV) Infection in the Netherlands

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Reference numbers

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To cite this report, please use: van Sighem A.I., Boender T.S., Wit F.W.N.M., Smit C., Matser A., Reiss P. Monitoring Report 2018. Human Immunodeficiency Virus (HIV) Infection in the Netherlands. Amsterdam: Stichting HIV Monitoring, 2018. Available online at www.hiv-monitoring.nl

ISBN/EAN: 978-94-90540-09-8
First edition: November 2018
Editing: Sally H. Ebeling, Boston, MA, USA

Art Direction & DTP: Studio Zest, Wormer, the Netherlands

Monitoring programme report

1. The HIV epidemic in the Netherlands

Ard van Sighem and Eline Op de Coul

Introduction

As of May 2018, 28,457 HIV-positive individuals had ever been registered by Stichting HIV Monitoring (SHM). Of those, 27,352 were followed in one of the HIV treatment centres in the Netherlands (*Figure 1.1*), while the remaining 1,105 were followed in the St. Elisabeth Hospital in Willemstad, Curaçao (see *Chapter 9*). Of the 27,352 people in the Netherlands, the majority were diagnosed with HIV-1 (25,988; 95%). A small group of people, 98 in total, were diagnosed with HIV-2, while 68 people had antibodies against both HIV-1 and HIV-2. Serological results were not available in the SHM database for 1,198 individuals, a group that mostly comprised people who were registered in the AIDS Therapy Evaluation in the Netherlands (ATHENA) study, but for whom no data were collected.

This chapter will first focus on the characteristics of HIV-1-positive individuals at the time of diagnosis or at the time of entering HIV care, followed by a brief overview of the group of people who are HIV-2-positive. The second part will discuss the HIV-1-positive individuals who were in care at the end of 2017.

Box 1.1: Definitions of infection, diagnosis, entry into care and registration.

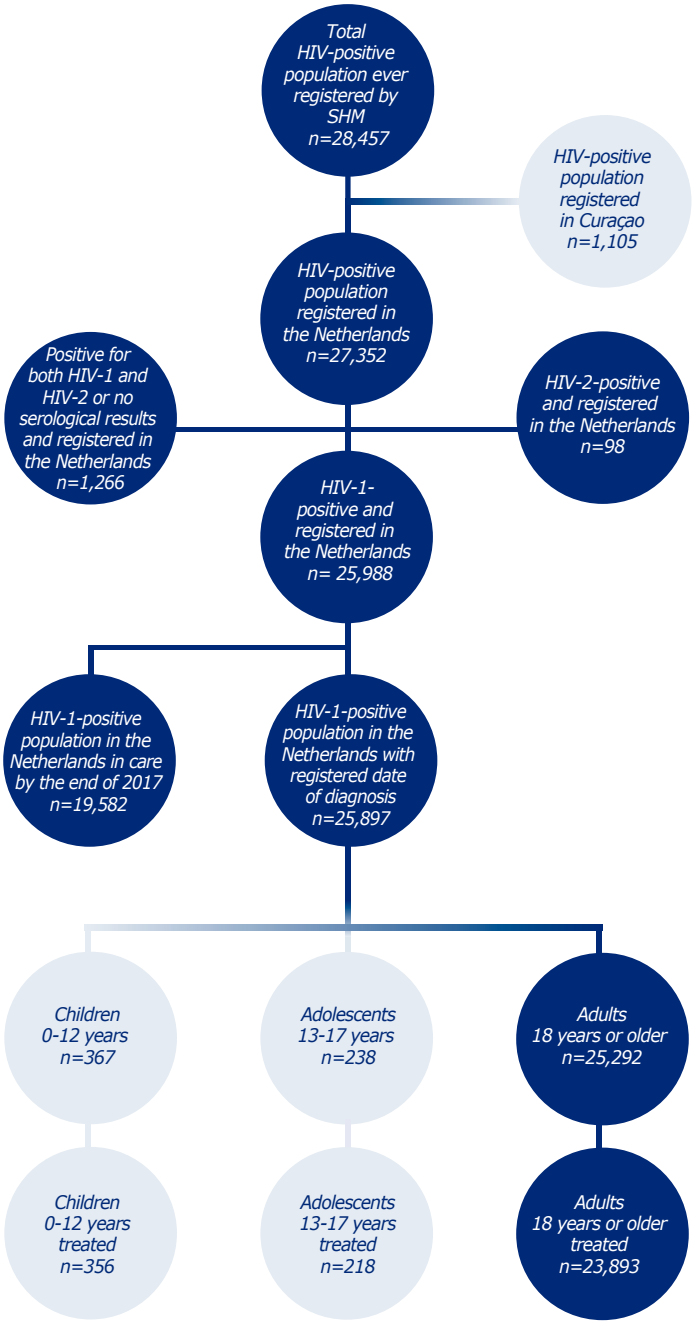
Infection	The moment an individual acquires an HIV infection. The time of infection is often unknown.
Diagnosis	The moment an individual is newly diagnosed with an HIV infection. The time of diagnosis can be weeks, months, or years after infection.
Entry into care	The moment an HIV-positive individual is first seen for care in an HIV treatment centre, which usually is within a few weeks of HIV diagnosis.
Registration	The moment an HIV-positive individual in care is notified to SHM by their treating HIV physician or nurse and registered in the SHM database. Registration is usually within a few months of entering care, but can take longer. Collection of demographic and clinical data from the time of HIV diagnosis can only be done after an HIV-positive individual is registered with SHM.

Population – HIV-1

HIV-1-positive individuals

Altogether, 25,292 individuals were ever diagnosed with HIV-1 as adults and had a recorded date of diagnosis (*Figure 1.1*). The majority of these 25,292 adults were men who have sex with men (MSM; 15,281 [60%]), while 3,441 other men (14%) and 4,139 (16%) women reportedly acquired their HIV infection via heterosexual contact (*Appendix Table 1.1*). For 767 (3%) individuals, the reported mode of transmission was injecting drug use, while for 326 (1%) individuals infection occurred through exposure to contaminated blood. Other and unknown modes of transmission accounted for the remaining 5% (1,338) of infections.

Figure 1.1: Overview of the HIV-positive population registered by Stichting HIV Monitoring (SHM) as of the end of 2017.

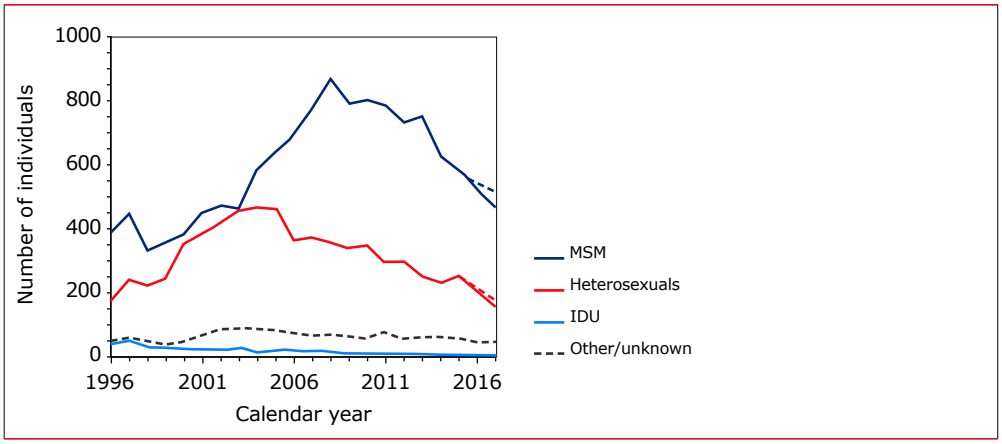


Decreasing number of diagnoses

From the 1990s until 2008, the annual number of new diagnoses in the entire population increased from approximately 650 to well above 1,300 (*Appendix Table 1.1*). From 2009 onwards, the registered number of new diagnoses has steadily declined. In 2017, the decreasing trend continued and the projected number of new HIV diagnoses, taking into account a backlog[a] in registration of HIV cases, was approximately 750.

In MSM, the annual number of diagnoses was approximately 400 in 1996 and increased to more than 850 in 2008 (*Figure 1.2*). Thereafter, the number of diagnoses decreased gradually to approximately 516 in 2017. In individuals who acquired their HIV infection via heterosexual contact, the number of new diagnoses has declined to approximately 200 cases per year in the last few years. As shown later in this chapter, this decline in the heterosexual population is largely the result of a reduced number of diagnoses in people born abroad. Finally, injecting drug use is now rarely reported as the most probable mode of transmission, which reflects the decreasing popularity of injecting drugs.

Figure 1.2: *Annual number of new HIV-1 diagnoses among adults, according to most likely mode of transmission. In 2017, men who have sex with men (MSM) accounted for 69% of new diagnoses, infections via heterosexual contact for 23%, infections via injecting drug use for 0%, and infections via other or unknown modes of transmission for 7% of the annual number of diagnoses. The dotted lines indicate the projected number of diagnoses when the backlog in registration of HIV cases (3% in 2016, 11% in 2017) is taken into account.*



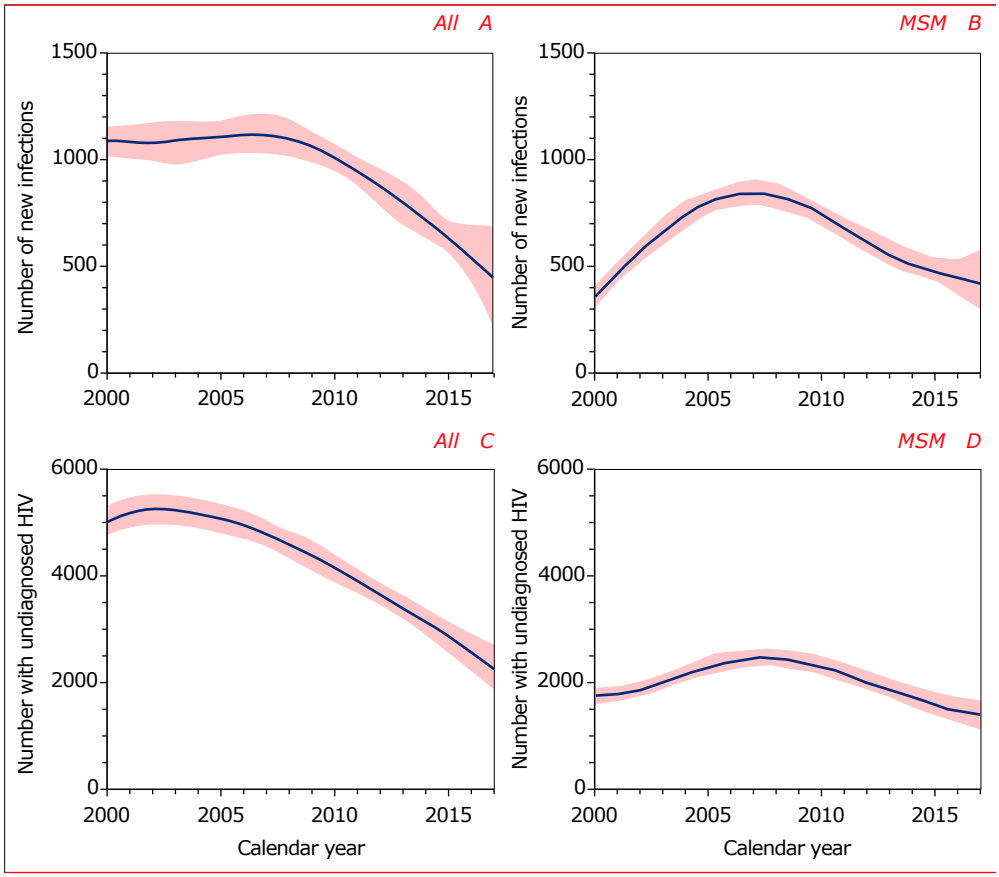
Legend: *MSM=men who have sex with men; IDU=injecting drug use.*

a *As it may take some time before people living with HIV are registered in the SHM database by their treating physician, there is some backlog for the most recent calendar years. Based on past trends, this backlog is estimated to be 3% in 2016 and 11% in 2017.*

Decreasing number of newly-acquired infections

The observed changes over time in the number of HIV diagnoses are, in part, a consequence of changes in the annual number of newly-acquired HIV infections. According to the European Centre for Disease Prevention and Control (ECDC) HIV Modelling Tool, there were approximately 1,000 newly-acquired HIV infections each year between 2000 and 2010[1]. Thereafter, the number of new infections decreased over time to 450 (95% CI, 200-650) in 2017 (*Figure 1.3A*). In MSM, the annual number of newly-acquired HIV infections reached a peak of approximately 800 around 2007 and then decreased to around 400 (95% CI, 250-550) in 2017 (*Figure 1.3B*). Since 2000, the number of people estimated to be living with undiagnosed HIV has decreased, although this decrease was less pronounced among MSM (*Figure 1.3C* and *1.3D*).

Figure 1.3: *Estimated annual number of newly-acquired HIV infections and number of people living with undiagnosed HIV (A, C) in the entire HIV-positive population in the Netherlands and (B, D) in men who have sex with men.*

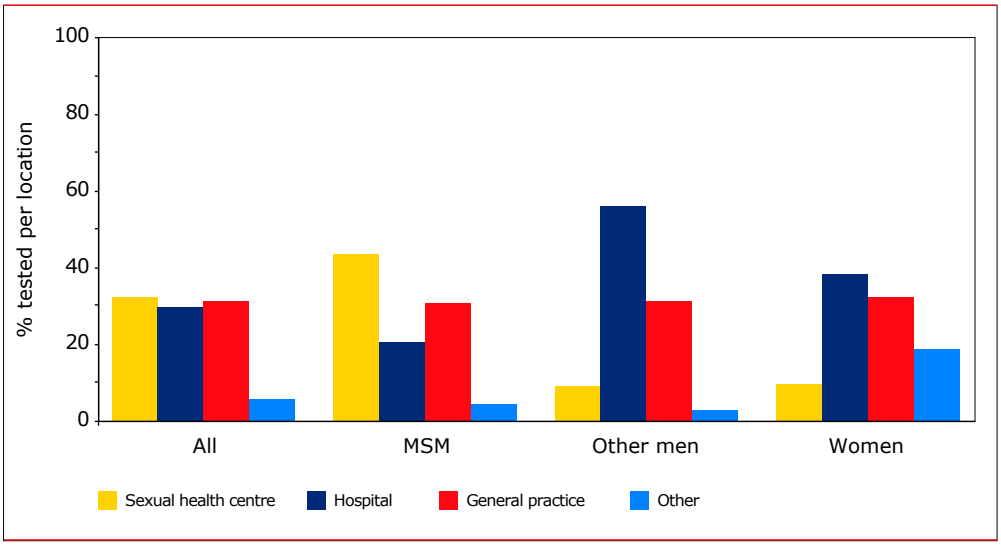


Legend: *MSM=men who have sex with men.*

Testing location

Information on the location of HIV testing was available for 90% of people diagnosed in 2015 or later. Overall, 30% of these individuals received their first HIV-positive test result at a sexual health centre, 27% at a hospital, and 28% at a general practice (*Figure 1.4*). Among those tested at sexual health centres, 90% were MSM, 6% were other men, and 4% were women. These proportions are identical to those directly reported by sexual health centres in 2017[2].

Figure 1.4: *Proportion of individuals diagnosed in 2015 or later, stratified by location of testing and transmission risk group.*



Legend: *MSM=men who have sex with men.*

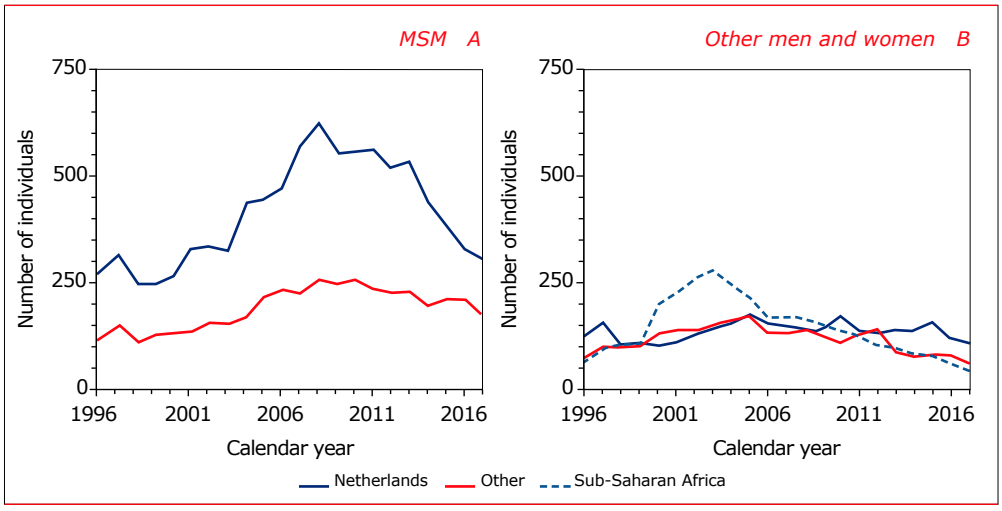
Geographical region of origin

Overall, 69% of people who acquired HIV via homosexual contact originated from the Netherlands, 11% from other European countries, 7% from South America, and 4% from the Caribbean (*Figure 1.5A*). In recent years (i.e., in those diagnosed in or after 2015), the proportion of MSM of Dutch origin was 63% (*Appendix Table 1.2*), while minor changes were observed in the proportion of MSM from western and central Europe and the Caribbean.

Among women and other men, only 37% originated from the Netherlands, while 33% originated from sub-Saharan Africa, 8% from South America, 5% from the Caribbean, and 4% from south and south-east Asia (*Figure 1.5B*). However, the

number of new diagnoses among sub-Saharan Africans dropped sharply after 2003, probably partly as a result of stricter immigration laws that came into effect in the Netherlands around that time. From 2015 onwards, 50% of the newly-diagnosed women and other men were of Dutch origin, and 23% originated from sub-Saharan Africa.

Figure 1.5: *Annual number of diagnoses by region of origin among (A) men who have sex with men (MSM) and (B) other people aged 18 years or older at the time of diagnosis. Of the 15,281 MSM, 10,582 (69%) originated from the Netherlands, 1,670 (11%) from other European countries, 1,048 (7%) from South America, and 592 (4%) from the Caribbean. Among the other 10,011 people, 3,332 (33%) originated from sub-Saharan Africa, 3,701 (37%) from the Netherlands, 849 (8%) from South America, 460 (5%) from the Caribbean, and 411 (4%) from south and south-east Aisa. Note: data collection for 2016 and 2017 has not yet been finalised.*



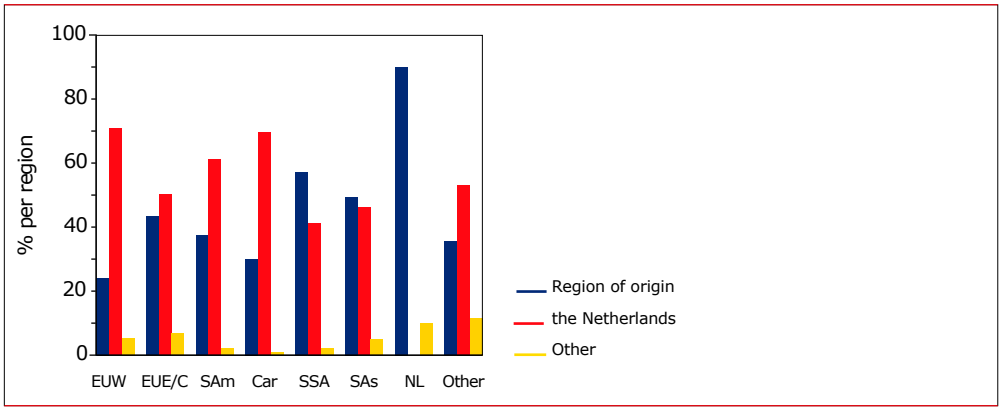
Legend: *MSM=men who have sex with men.*

Overall, 21% of the people newly diagnosed since 2015 were living in the Amsterdam public health service (PHS) region at the time of diagnosis and 14% were living in the Rotterdam-Rijnmond PHS region. These proportions were 15% and 13%, respectively, for people of Dutch origin and 29% and 16%, respectively, for people originating from other countries. Among MSM, 24% were living in Amsterdam at the time of diagnosis and 14% were living in Rotterdam, while in other groups these proportions were 14% and 15%, respectively. Other PHS regions with at least 4% of new diagnoses were Haaglanden (7%, including Den Haag), Utrecht (6%), Hart voor Brabant (5%, including Den Bosch and Tilburg), and Gelderland-Midden (4%, including Arnhem).

Geographical region of HIV acquisition

The most likely country of HIV acquisition was reported for 1,810 (75%) of the adult population diagnosed in 2015 or later (*Figure 1.6*). The majority of the people born in the Netherlands (90%) reported having acquired their HIV infection in the Netherlands. Among foreign-born individuals, the proportion who acquired their HIV infection in the Netherlands increased from 39% before 2015 to 55% in 2015 or later. This shift towards migrants being more likely to acquire their HIV infection in the Netherlands was most apparent in people born in sub-Saharan Africa. Before 2015, 81% reported probably having acquired their HIV infection in sub-Saharan African and 16% in the Netherlands, whereas these proportions were 57% and 41%, respectively, among those diagnosed in 2015 or later.

Figure 1.6: *Proportion of all HIV-1-positive adults diagnosed in 2015 or later per region of origin who reported to have acquired their HIV infection in their own region of origin, in the Netherlands, or elsewhere.*



Legend: *EUW=Western Europe; EUE/C=Eastern and Central Europe; SAm=South America; Car=Caribbean; SSA=sub-Saharan Africa; SAs=south and south-east Asia; NL=the Netherlands; Other=other regions of origin.*

The majority (82%) of MSM diagnosed in 2015 or later acquired their HIV infection in the Netherlands. Of the other people with a reported region of acquisition, 66% acquired HIV in the Netherlands, while 14% reported having acquired HIV in sub-Saharan Africa. The proportion of Dutch-born people who likely acquired HIV in the Netherlands was 91% for MSM, 84% for other men and 86% for women.

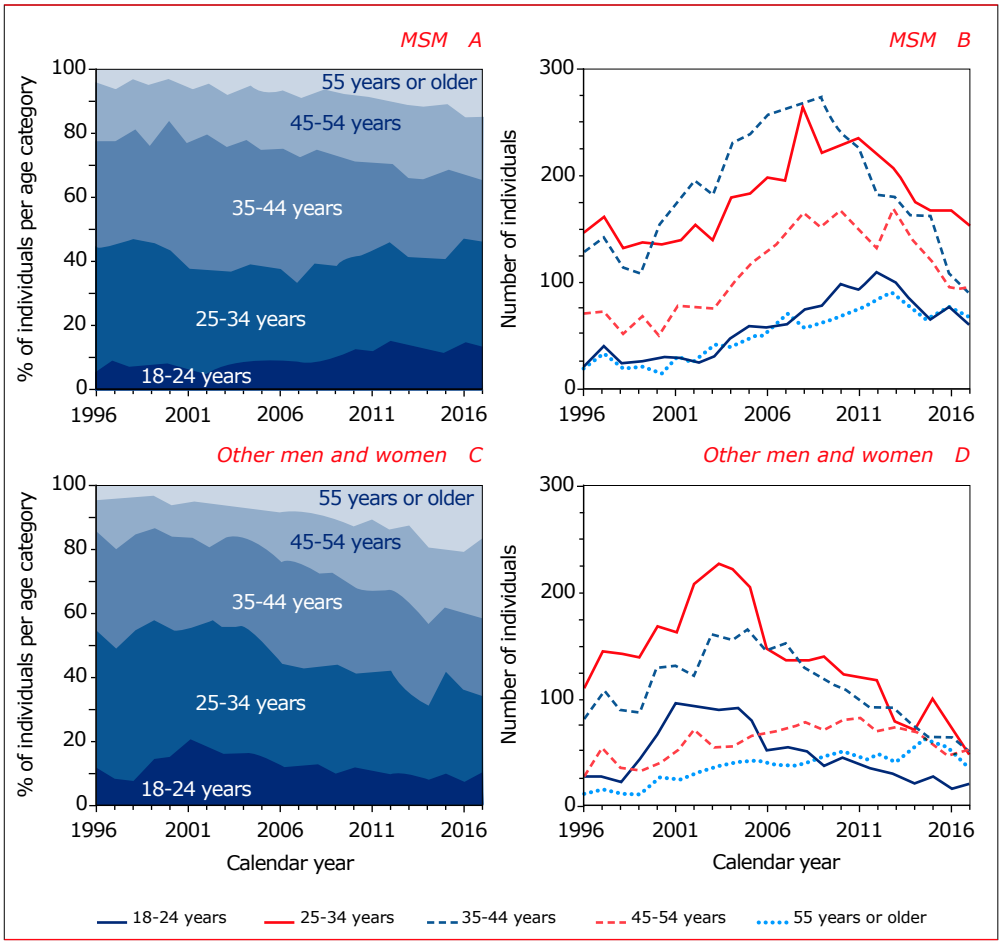
Increasingly older age at time of HIV diagnosis

The age at which individuals are diagnosed with HIV has been slowly increasing over time. In 1996, the median age at the time of diagnosis was 35 (interquartile range [IQR] 30-42) years; in 2017, it was 38 (IQR 29-50) years. Over the entire period from 1996 through 2017, 16% of adults who received an HIV diagnosis were 50 years or older; in 2017, 25% were 50 years or older.

There were considerable age differences between MSM, other men, and women diagnosed in 2015 or later. MSM born in the Netherlands were diagnosed at a median age of 42 (31-52) years, while those of foreign origin were diagnosed at 32 (27-40) years. Among other people of Dutch origin, the median age at the time of diagnosis was 40 (30-56) years for women and 46 (32-57) years for men. Individuals born in sub-Saharan Africa (women: 37 years; men: 39 years) or elsewhere (women: 36 years; men: 38 years) were substantially younger than their Dutch counterparts.

For MSM, the age distribution at the time of diagnosis has gradually changed over time, while for other individuals there were no notable changes up to 2003 (*Figure 1.7*). Thereafter, the age of other individuals at diagnosis started to increase concomitantly with the decreasing number of diagnoses among people from sub-Saharan Africa, who were generally younger than those of Dutch or other origin.

Figure 1.7: *Age distribution at the time of diagnosis among HIV-1-positive (A, B) men who have sex with men (MSM) and (C, D) other men and women. Between 1996 and 2017, the proportion of MSM aged 45 years or older at the time of diagnosis increased from 24% to 35%, while these proportions were 15% and 42% for other individuals. During the same period, the proportion of individuals between 25 and 34 years of age decreased from 38% to 33% for MSM and from 43% to 23% for other individuals.*



Legend: *MSM=men who have sex with men.*

Young adults

The number of diagnoses among young adults less than 25 years of age who did not acquire their HIV infection via homosexual contact was approximately 90 in the early 2000s and decreased to approximately 20 in 2017, or to 10% of the annual number of diagnoses (*Figure 1.7*). Among MSM, both the number and proportion of diagnoses among young adults increased over time and, in 2012, young adults accounted for 15% (109) of the diagnoses. Thereafter, the proportion of diagnoses among young MSM remained around this level, although the absolute number has decreased.

Entry into care

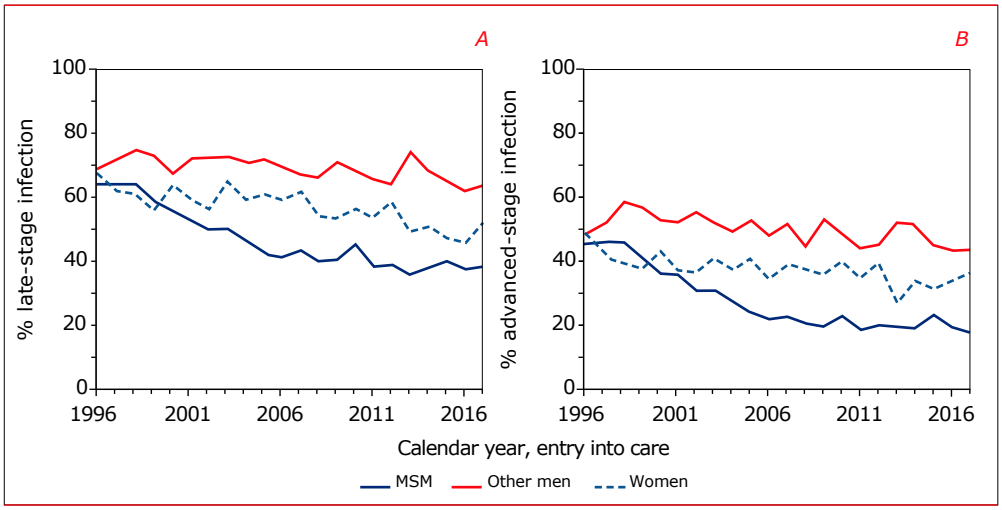
Of all individuals diagnosed with HIV in 2015 or later for whom the location of testing was known, excluding those diagnosed abroad, 92% had entered care within 4 weeks of receiving their diagnosis and 96% within 6 weeks. The proportion in care within 6 weeks was 96% for individuals who received their first HIV-positive test at a sexual health centre, and similar for those who tested HIV-positive in a hospital (97%), at a general practice (96%), or at other locations (96%). Overall, the proportion in care within 6 weeks was similar for MSM (96%), other men (96%), and women (97%), and did not differ by age at the time of diagnosis. However, the proportion in care within 6 weeks was larger among individuals born in the Netherlands (98%) than among those born abroad (94%).

Late presentation

In total, 30% of the individuals entering care from 1996 onwards had CD4 counts of 500 cells/mm^3 or higher, 20% had CD4 counts between 350 and 499 cells/mm^3, 20% had CD4 counts between 200 and 349 cells/mm^3, and 30% had CD4 counts below 200 cells/mm^3, while 17% had already been diagnosed with AIDS. For people entering clinical care in 2015 or later, these proportions had somewhat improved and were 36%, 21%, 19%, and 25%, respectively; 12% had already been diagnosed with AIDS.

Overall, 52% of the individuals were late presenters, i.e., presenting for care with either a CD4 count below 350 cells/mm^3 or an AIDS-defining event regardless of CD4 count[3]. Although the proportion of late presenters has decreased over time, in 2017, 45% of people entered clinical care late in their infection (*Figure 1.8*; *Appendix Figure 1.1*). In addition, the proportion of individuals presenting for care with advanced HIV disease, i.e., with a CD4 count below 200 cells/mm^3 or AIDS, has likewise decreased over time and was 26% in 2017.

Figure 1.8: Proportion of individuals classified as presenting with (A) late-stage or (B) advanced-stage HIV infection at the time of entry into care. From 1996 (2015) onwards, 52% (44%) presented with late-stage HIV infection: men who have sex with men (MSM) 44% (38%), other men 69% (63%), and women 57% (48%). Overall, 33% (27%) presented with advanced-stage HIV infection: MSM 26% (20%), other men 51% (45%), and women 38% (34%). Late-stage HIV infection: CD4 counts below 350 cells/mm³ or having AIDS, regardless of CD4 count. Advanced-stage HIV infection: CD4 counts below 200 cells/mm³ or having AIDS.



Legend: MSM=men who have sex with men.

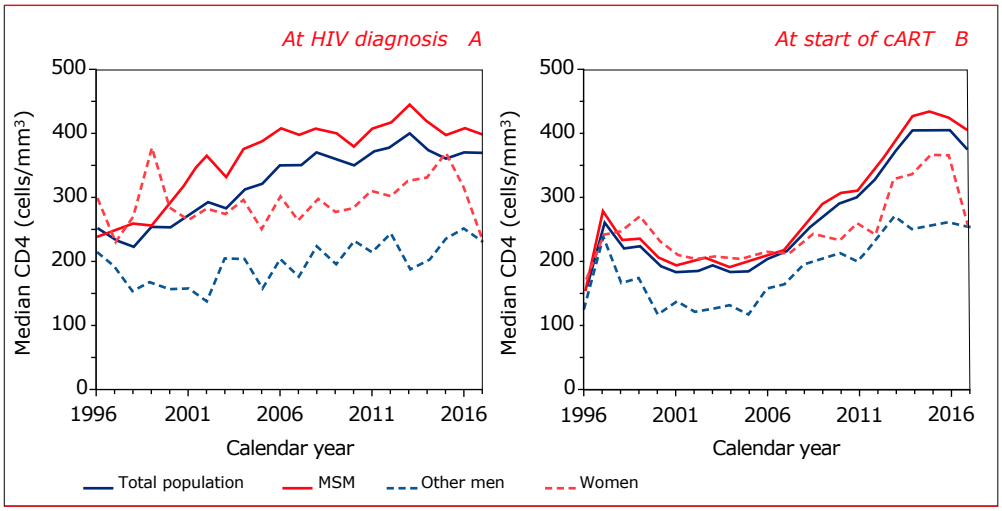
Among individuals entering clinical care in 2015 or later, 38% of MSM, 63% of other men, and 48% of women were late presenters. Late presentation was most commonly found among people originating from sub-Saharan Africa (57%) or south and south-east Asia (56%), and among people originating from the Netherlands (60%) or from South America (54%) who acquired their HIV infection via other routes than homosexual contact (*Appendix Table 1.3*).

Late presentation was also more common in individuals entering care at older ages. Late presentation was seen in 50% of MSM, 71% of other men, and 59% of women entering care in 2015 or later at 45 years of age or older, compared with 23% of MSM, 48% of other men, and 26% of women entering care at ages younger than 25 years (*Appendix Table 1.3*). Although testing behaviour and frequency may differ between these two age groups, the relatively shorter period of sexual activity of those diagnosed at younger ages also accounts for these observed differences. Late presentation was also observed more often in people who received their HIV diagnosis at a hospital (75%) compared with those who were tested at a general practice (44%), a sexual health centre (26%), or another testing location (38%).

Earlier diagnosis

Between 1996 and 2017, median CD4 counts in the total adult population at the time of diagnosis increased from 250 to 380 cells/mm³ (*Figure 1.9A*). This overall increase was mainly the result of a rise in CD4 counts in MSM, whereas CD4 counts in women and in other men showed more modest increases.

Figure 1.9: *Changes over calendar time in median CD4 counts (A) at HIV diagnosis and (B) at the start of combination antiretroviral therapy (cART). (A) Between 1996 and 2017, CD4 counts at the time of diagnosis increased from 250 (interquartile range [IQR], 80–437) to 380 (IQR 182–550) cells/mm³ in the total adult population. The increase was most apparent for men who have sex with men (MSM): 245 (IQR 80–450) cells/mm³ in 1996 and 410 (IQR 260–580) cells/mm³ in 2017. During the same period, CD4 counts in other men and in women were 220 (IQR 40–410) and 300 (IQR 130–450) cells/mm³, respectively, in 1996, and 235 (IQR 100–460) and 237 (IQR 83–480) cells/mm³ in 2017. (B) In the total adult population, CD4 counts at the start of cART rose to 260 (IQR 130–400) cells/mm³ shortly after cART became available, decreased to a plateau of approximately 180 cells/mm³ between 2000 and 2005, and increased thereafter. In 2017, CD4 counts were 380 (IQR 202–554) cells/mm³ in the total population, 410 (IQR 260–580) cells/mm³ in MSM, 254 (IQR 100–470) cells/mm³ in other men, and 256 (IQR 80–360) cells/mm³ in women. The apparent decrease in CD4 counts in women in 2017 is most likely a consequence of the relatively low number of diagnoses in this group.*



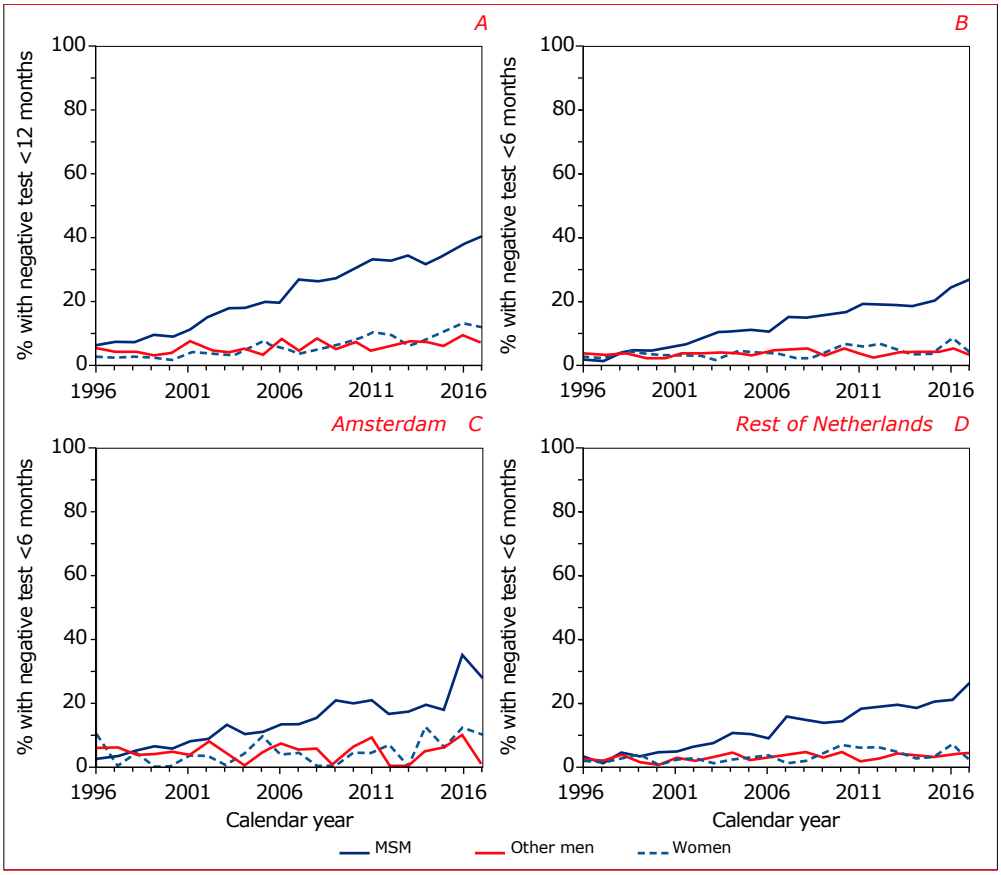
Legend: *MSM=men who have sex with men; cART=combination antiretroviral therapy.*

Recent infection

The increase in CD4 counts at diagnosis, in conjunction with a decreasing proportion of late presenters, suggests that, on average, people are being diagnosed increasingly earlier in the course of their HIV infection. Another indication of earlier diagnosis is the increase in the proportion of individuals who were

diagnosed with strong evidence of a recent infection, based on a known negative HIV test 6 or 12 months, at most, before their first positive test (*Figure 1.10*). Among MSM diagnosed between 2010 and 2015, 33% had a negative test in the 12 months before diagnosis, while 18% had a negative test in the 6 months before diagnosis; by 2017, these proportions had increased to 40% and 26%, respectively. For other men and for women, the proportions with a recent infection between 2010 and 2017 were considerably lower: only 7% had a negative test in the 12 months before diagnosis, while 4% had a negative test in the 6 months before diagnosis.

Figure 1.10: *Proportion of people diagnosed and having (A) a last negative test at most 12 months before diagnosis, or (B) a last negative test at most 6 months before diagnosis. Panels C and D show the proportions with a last negative test in the preceding 6 months for (C) Amsterdam and (D) for the rest of the Netherlands. Altogether, 40% of men who have sex with men (MSM), 7% of other men, and 12% of women diagnosed in 2017 had a last negative test at most 12 months before diagnosis, whereas 26% of MSM, 3% of other men, and 2% of women had a last negative test at most 6 months before diagnosis.*



Legend: *MSM=men who have sex with men.*

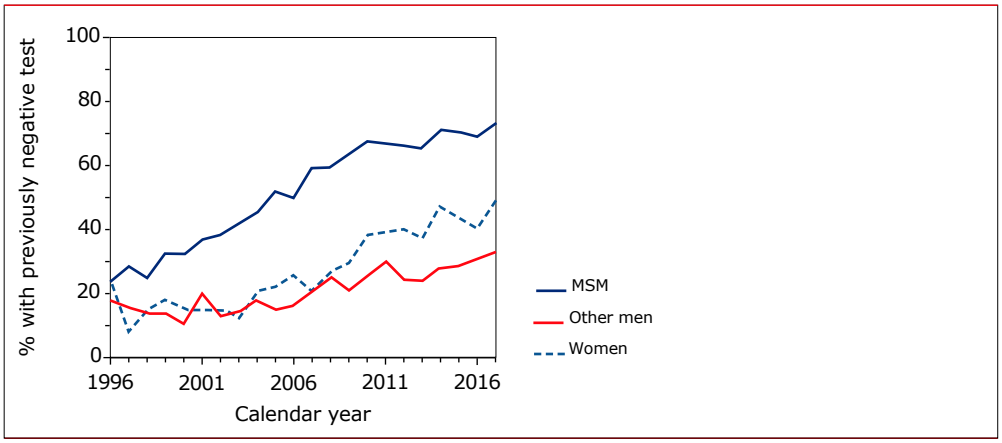
Amsterdam compared with the rest of the Netherlands

Last year, we reported an increase in the proportion of MSM in Amsterdam with a negative test in the 6 months before diagnosis - from 18% between 2010 and 2015 to 36% in 2016 - while there was a more modest increase in the rest of Netherlands[4]. In this year's monitoring report, with more data being available for 2016, the proportion was slightly lower at 34% in 2016 and 27% in 2017 (*Figure 1.10C*). In the rest of the Netherlands, the proportion with a negative test in the 6 months before diagnosis was 21% in 2016 and increased to 26% in 2017, which was not significantly different from the proportion in Amsterdam in that year (*Figure 1.10D*).

Increasing frequency of testing

Since both the proportion of recent infections and CD4 counts at diagnosis have increased among those diagnosed with HIV, testing for HIV has apparently become more common. An additional indication for this is the increasing proportion of people with a known previous negative HIV test (*Figure 1.11*). In 2017, 73% of MSM, 33% of other men, and 49% of women newly diagnosed with HIV had a known previous test with a negative result. The proportion with a known previously negative test was highest among those diagnosed at a sexual health centre (81%), compared with 40% of those diagnosed in a hospital, 61% of those diagnosed at a general practice, and 79% of those diagnosed elsewhere.

Figure 1.11: *Proportion of individuals diagnosed after a previously negative HIV test. Altogether, 73% of men who have sex with men (MSM), 33% of other men, and 49% of women diagnosed in 2017 had a previously negative HIV test.*



Legend: *MSM=men who have sex with men.*

Treated population

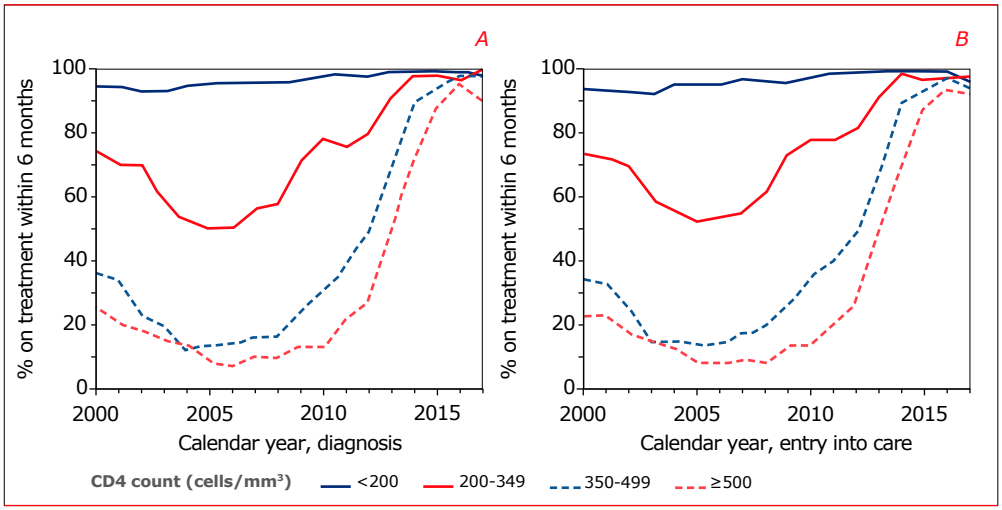
Of the 25,292 adults ever registered with an HIV-1 infection, 23,893 (94%) had started cART by May 2018. The majority of these individuals (89%) started cART while being antiretroviral therapy-naive. Treatment and treatment outcomes are described in more detail in *Chapter 2*.

Earlier start

In the past few years, cART has been started increasingly earlier in the course of HIV infection, as evidenced by higher CD4 counts at the start of treatment since the mid-2000s (*Figure 1.9B*). In 2017, median CD4 counts at the start of treatment had increased to 380 cells/mm^3. Of those starting cART in 2017, 24% of people started treatment at CD4 counts already below 200 cells/mm^3, 21% started at CD4 counts between 200 and 349 cells/mm^3, 24% started at CD4 counts between 350 and 499 cells/mm^3, and 32% started at CD4 counts of 500 cells/mm^3 or above.

The main reason for starting treatment too late, i.e., at low CD4 counts, appears to be a late diagnosis, because most people who are able to start treatment on time now do so. Those with less than 200 CD4 cells/mm^3 at diagnosis or at the time of entry into care have always started treatment almost immediately, with nearly everyone starting cART within 6 months after diagnosis (*Figure 1.12*). On the other hand, those with higher CD4 counts used to be less likely to start treatment within 6 months of diagnosis, but this likelihood has rapidly increased in recent years, reflecting changes in treatment guidelines towards a universal start of treatment regardless of CD4 count. In 2017, for all CD4 strata, at least 90% of people who were diagnosed with HIV or who entered care in that year had started treatment within 6 months. The tendency to start treatment earlier after diagnosis is reflected in converging CD4 counts at the time of diagnosis and at start of cART (*Appendix Figure 1.2*).

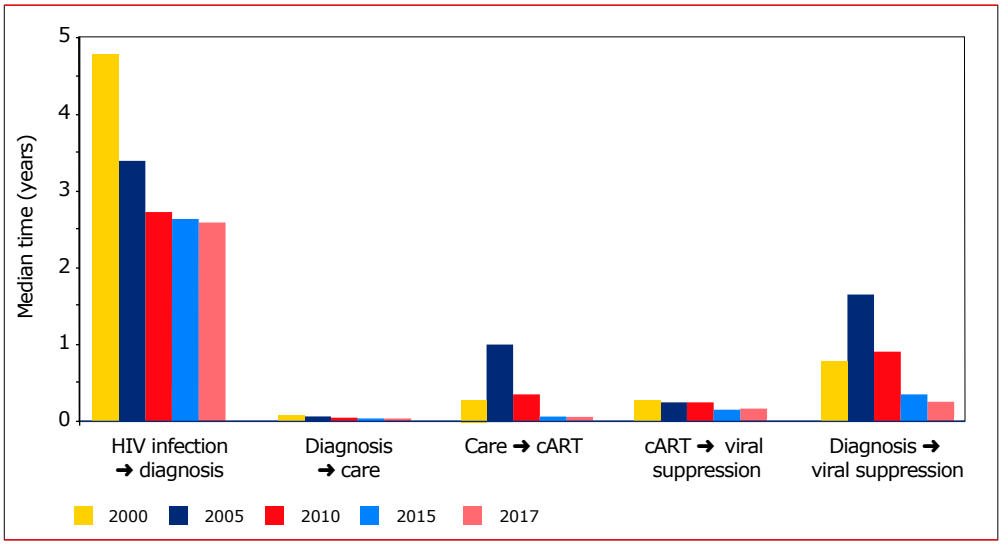
Figure 1.12: (A) Proportion of individuals who started combination antiretroviral treatment (cART) within 6 months after HIV diagnosis by CD4 count at the time of diagnosis. (B) Proportion of individuals who started cART within 6 months after entry into care, stratified by CD4 counts at the time of entry into care. Individuals were considered only if they had more than 6 months of follow up after diagnosis or entry into care. Of all individuals diagnosed in 2015 or later, 99% of those with CD4 counts below 200 cells/mm³, 98% of those with CD4 counts between 200 and 349 cells/mm³, 96% of those with CD4 counts between 350 and 499 cells/mm³, and 91% of those with CD4 counts of 500 cells/mm³ or above had started cART within 6 months of diagnosis. In people who entered HIV care in 2015 or later, 99% of those with CD4 counts below 200 cells/mm³, 97% of those with CD4 counts between 200 and 349 cells/mm³, 95% of those with CD4 counts between 350 and 499 cells/mm³, and 91% of those with CD4 counts of 500 cells/mm³ or above had started cART within 6 months of entry.



Time between HIV infection and viral suppression

People with a suppressed viral load are highly unlikely to transmit their virus to uninfected partners[5,6]. Therefore, it is of paramount importance, not only for people living with HIV, but also from a public health perspective, to minimise the time between the moment a person acquires HIV and the point at which they achieve viral suppression[7]. However, to reach viral suppression, people with HIV must first be diagnosed, then linked to care, and subsequently start treatment. Over time, significant improvements have been realised in these three steps in the HIV care continuum (*Figure 1.13*). Between 2000 and 2017, the median time from infection to diagnosis in the entire HIV-1-positive population was estimated to have decreased from 4.7 (IQR 2.3-8.4) to 2.6 (1.3-4.8) years. During this same period, the median time from diagnosis to viral suppression decreased from 0.79 (IQR 0.40-3.58) years to 0.24 (0.15-0.41) years, mainly as a result of starting treatment earlier after entry into care.

Figure 1.13: Estimated time to reach key stages in the HIV care continuum for HIV-1-positive individuals, including time from infection to diagnosis, from diagnosis to entry into care, from entry into care to starting combination antiretroviral treatment (cART), from starting cART to reaching viral suppression (defined as an RNA measurement below 200 copies/ml), and from diagnosis to viral suppression.



Legend: cART=combination antiretroviral therapy.

Population – HIV-2

HIV-2-positive individuals

In total, 98 of the 27,352 registered individuals, including 45 men and 53 women, acquired an HIV-2 infection, of whom 19 were diagnosed in 2008 or later. The majority (79, or 81%) of these people acquired their infection via heterosexual contact. HIV-2 is endemic in West Africa, and 66 people originated from this region, mostly from Ghana (25 people) or Cape Verde (24 people). Only 20 individuals were born in the Netherlands, 14 of whom reported to have acquired their HIV infection in the Netherlands. A total of 64 people were still in clinical care, 16 people had died, 6 had moved abroad, while 12 individuals had no contact with HIV care in 2017.

The median age of the people still in care was 60 (IQR 53-63) years; 83% were 50 years or older. The median age at the time of diagnosis was 41 years, which is considerably higher than for HIV-1-positive individuals. For the 82 individuals who were diagnosed in 1996 or later, the median CD4 count at the time of diagnosis

was 340 (93-691) cells/mm^3. From 1996 onwards, 47% of the people were late presenters, and 38% presented for care with advanced HIV disease[3]. The distribution of CD4 counts at entry into care appeared to be more bimodal than for HIV-1-positive individuals: 37% had CD4 counts below 200 cells/mm^3, 40% had CD4 counts of 500 cells/mm^3 or higher, while relatively few people (23%) had CD4 counts between 200 and 499 cell/mm^3.

Treatment

In total, 60 HIV-2-positive individuals had ever started cART. Of the 40 of these individuals who were still in care by the end of 2017, 19 used a backbone of abacavir/lamivudine and 14 used tenofovir/emtricitabine. Additional drugs in the regimen included cobicistat-boosted or ritonavir-boosted darunavir in 17 individuals, ritonavir-boosted lopinavir in 8 individuals, atazanavir in 4 individuals (all ritonavir-boosted, except one), and dolutegravir in 11 individuals.

At start of cART, 25 individuals had HIV-2 RNA levels above 500 copies/ml, while 16 had levels below this threshold. Of the 64 people who were still in care, 56 had a most recent viral load measurement below 500 copies/ml, 2 had a viral load above 500 copies/ml, and 6 people had no available HIV-2 RNA result in 2016 or 2017. The 24 individuals who were still in care and had not, or not yet, started cART still had high CD4 counts with a median of 750 (520-945) cells/mm^3. All of the 20 non-treated individuals who had an HIV-2 RNA result in 2016 or 2017 had a viral load below 500 copies/ml.

HIV-1-positive people in care

Population in care

In total, 19,582 (75%) of the 25,988 registered HIV-1-positive individuals, comprising 19,390 adults and 192 minors less than 18 years of age, were known to be in clinical care (*Figure 1.1*; *Table 1.1*; *Appendix Table 1.4*) by the end of 2017. People were considered to be in clinical care if they visited their treating physician in 2017 or had a CD4 count or HIV RNA measurement in that year and they were still living in the Netherlands. Of the 6,406 people who, according to this definition, were no longer in care, 2,921 (46%) were known to have died, and 1,646 (26%) to have moved abroad, while 135 (2%) only entered HIV care in 2018 or were diagnosed with HIV in 2018.

Table 1.1: Characteristics of the 19,582 HIV-1-positive individuals in clinical care by the end of 2017. An extended version of this table is available as Appendix Table 1.4.

	Men (n=15,971, 82%)		Women (n=3,611, 18%)		Total (n=19,582)	
	n	%	n	%	n	%
Transmission						
MSM	12,378	78	-	-	12,378	63
Heterosexual	2,417	15	3,175	88	5,592	29
IDU	216	1	76	2	292	1
Blood (products)	166	1	95	3	261	1
Other/unknown	794	4	265	7	1,059	5
Current age [years]						
0-12	56	0	72	2	128	1
13-17	40	0	24	1	64	0
18-24	268	2	88	2	356	2
25-34	1,817	11	484	13	2,301	12
35-44	3,165	20	1,024	28	4,189	21
45-54	5,313	33	1,136	31	6,449	33
55-64	3,666	23	562	16	4,228	22
65-74	1,399	9	171	5	1,570	8
≥75	247	2	50	1	297	2
Region of origin						
The Netherlands	10,637	67	1,098	30	11,735	60
Sub-Saharan Africa	1,070	7	1,453	40	2,523	13
Western Europe	904	6	124	3	1,028	5
South America	1,070	7	330	9	1,400	7
Caribbean	663	4	172	5	835	4
South and south-east Asia	462	3	238	7	700	4
Other	1,108	7	186	5	1,294	7
Unknown	57	0	10	0	67	0
Years aware of HIV infection						
<1	563	4	82	2	645	3
1-2	1,327	8	230	6	1,557	8
3-4	1,552	10	239	7	1,791	9
5-10	4,355	27	766	21	5,121	26
10-20	5,623	35	1,725	48	7,348	38
>20	2,528	16	552	15	3,080	16
Unknown	23	0	17	0	40	0

Legend: MSM=men who have sex with men; IDU=injection drug use.

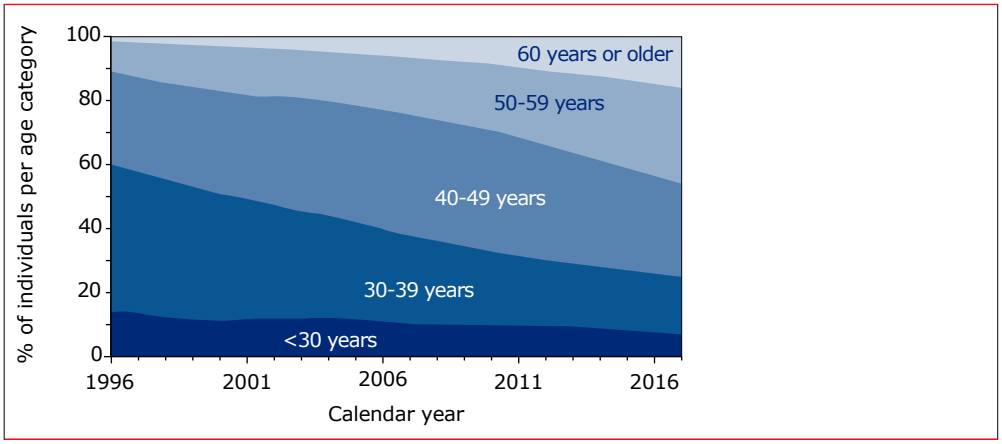
Loss to care

Of the 11,729 individuals who enrolled in HIV care between 2007 and 2016, 623 (5%) were lost to care before 2017 and were not reported as having died or moved abroad. The probability of being lost to care was lowest for people of Dutch origin: 5 years after enrolment 2% were estimated to no longer be in care. Of the individuals of sub-Saharan African origin, 15% of men and 9% of women were lost to care, as were 9% of men and 10% of women originating from other regions. Loss to care improved with increasing age at the time of entry into care: for every additional 5 years of age at the time of entry, individuals were 11% less likely to be lost to care.

Ageing population

The median age of the population in clinical care by the end of 2017 was 50 (IQR 40-57) and has been increasing since 1996 (*Figure 1.14*). This increase in age is mainly a result of the improved life expectancy of people with HIV after the introduction of cART. In addition, people are being diagnosed at increasingly older ages, as has been discussed earlier in this chapter. As a result, almost half of people currently in care (48%) are 50 years or older, including 51% of men and 35% of women; 18% of the people are 60 years or older (*Appendix Table 1.4*). As the HIV-positive population continues to age, it is to be expected that the number of individuals with age-related comorbidities will increase in the coming years, thereby complicating the management of their HIV infection (see *Chapter 3*).

Figure 1.14: *Increasing age of the HIV-1-positive population in clinical care over calendar time. In 1996, 14% of the individuals in care were younger than 30 years of age, whereas 11% were 50 years or older. In 2017, these proportions were 7% and 48%, respectively, while 18% of individuals in care were 60 years of age or older. The proportion of individuals in clinical care as of 31 December of each calendar year is shown according to those who were <30 years of age, 30 to 39 years, 40 to 49 years, 50 to 59 years, and 60 years or older.*



Duration of infection

People in clinical care by the end of 2017 had been diagnosed with HIV a median of 10.6 (IQR 6.0-16.5) years previously. Thus, a large group (53%) of those in care have been living with HIV for more than 10 years, while 16% had done so for more than 20 years. The median time since diagnosis was 9.9 years for men who have sex with men (MSM), 11.6 years for other men, and 12.5 years for women. The majority of people who use/used injecting drugs (93%) received their HIV diagnosis more than 10 years ago, which reflects the greatly decreasing number of new infections occurring via this mode of transmission.

Antiretroviral treatment

In total, 98% of the individuals in care had ever started cART, of whom the majority, 93%, used a once-daily regimen. Of the 367 (2%) individuals who had not yet started cART, 29 (8%) used an antiretroviral regimen that was not classified as cART, and 132 (36%) were diagnosed with HIV in 2017 and their treatment had most likely not yet been recorded in the SHM database. Antiretroviral treatment is discussed in more detail in *Chapter 2*.

Clinical condition

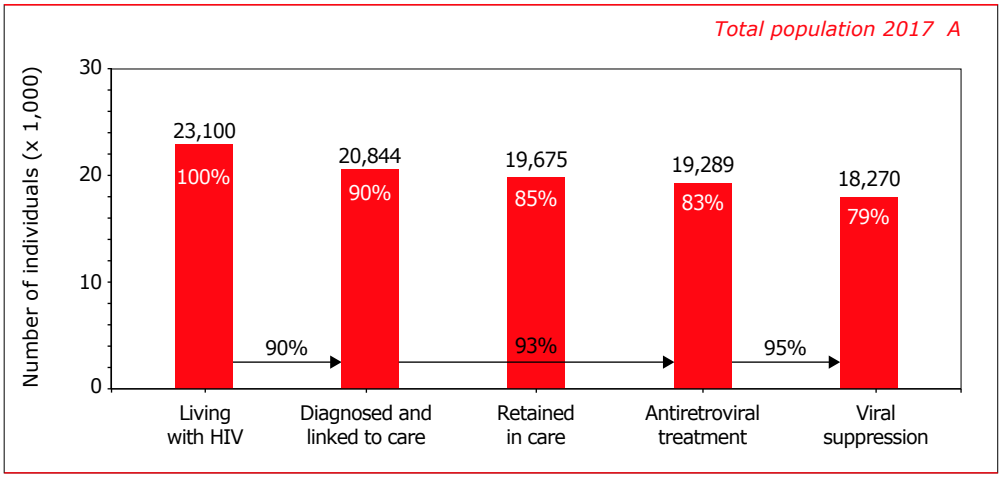
The median latest available CD4 count in 2017 of the people in care was relatively high at 670 (IQR 496-880) cells/mm^3, partly as a result of treatment and partly as a result of earlier diagnosis, as reported earlier in this chapter. CD4 counts were similar between MSM and women, but men who acquired HIV via other modes of transmission had lower CD4 counts (*Appendix Table 1.4*). For all people in care with a viral load measurement in 2017, their last measurement in that year was below 200 copies/ml for 96% and below 100 copies/ml for 95%. About one-fifth (23%) of the individuals had ever been diagnosed with an AIDS-defining disease; 57% of these people were diagnosed with AIDS concurrently with their HIV diagnosis.

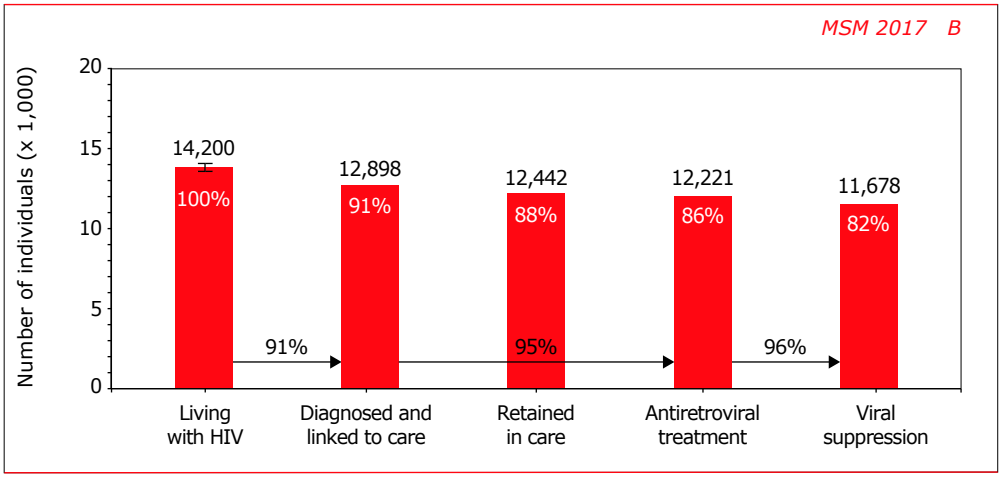
Continuum of HIV care

The total number of people living with HIV by the end of 2017, including those not yet diagnosed, was estimated at 23,100 (95% confidence interval [CI] 22,700-23,600), of whom 2,300 (1,900-2,700) were still undiagnosed[1]. Adjusted for registration delay, 20,844 individuals, or 90% of the total number estimated to be living with HIV, had been diagnosed, linked to care, and registered by SHM, while 19,675 individuals were considered to be retained in care (i.e., they had had at least one HIV RNA or CD4 count measurement or a clinic visit in 2017) (*Figure 1.15A*). The majority of these individuals (19,289, or 93% of those diagnosed and linked to care) had started antiretroviral treatment, and 18,270, or 95% of those treated, had a most recent HIV RNA measurement below 200 copies/ml, irrespective of

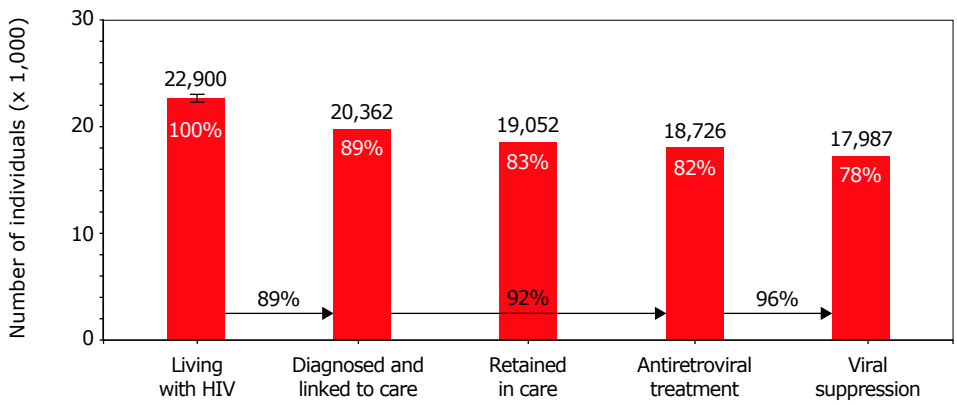
treatment. Overall, 79% of the total estimated population living with HIV and 88% of those diagnosed and ever linked to care had a suppressed viral load. Hence the Netherlands has reached the Joint United Nations Programme on HIV/AIDS (UNAIDS) 90-90-90 target for 2020 with the current estimate standing at 90-93-95[8]. Of the people still in care by the end of 2017, 13,686 (70%, or 75% of those with a CD4 measurement) had a most recent CD4 count of 500 cells/mm^3 or higher measured at most two years before.

Figure 1.15: Continuum of HIV care for (A, C) the total estimated HIV-1-positive population and for (B, D) men who have sex with men estimated to be living with HIV in the Netherlands by the end of 2017 and by the end of 2016. Percentages at the top of the bars are calculated relative to the number living with HIV, while percentages at the bottom correspond to UNAIDS' 90-90-90 targets. Numbers were adjusted for a backlog in registration of HIV cases (3% in 2016, 11% in 2017).

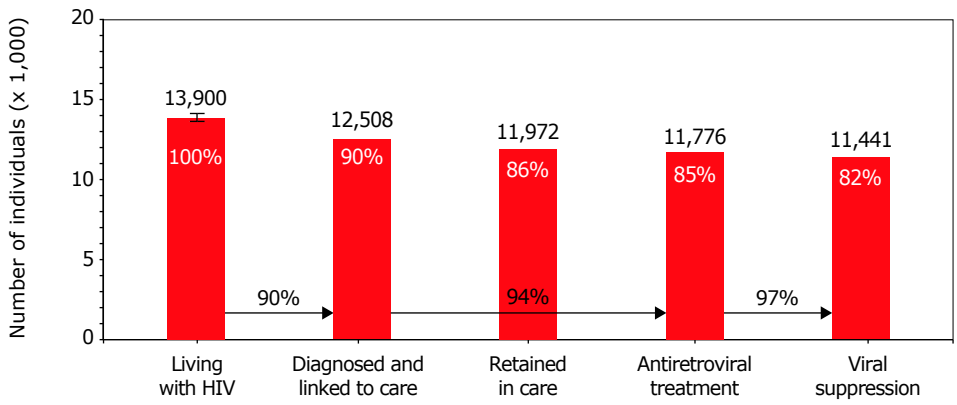




Total population 2016 *C*



MSM 2016 *D*



Lost to care

The estimated number of people living with HIV and the number of people diagnosed and linked to care excluded 573 individuals who had been diagnosed and linked to care, but were lost to care before the end of 2007, i.e. more than 10 years ago. It is unlikely that these 573 individuals are still living in the Netherlands without needing care or antiretroviral treatment. Of the 1,169 individuals lost to care (20,844 minus 19,675), 75% were born outside the Netherlands, whereas this proportion was only 40% for those who were still in care by the end of 2017. This suggests that some of those lost to care may actually have moved abroad, in particular back to their country of birth.

MSM

The number of MSM living with HIV at the end of 2017 was estimated to be 14,200 (14,000-14,500), of whom 1,300 (1,100-1,600) were still undiagnosed. Of these MSM estimated to be living with HIV, 12,898 (90%) had been diagnosed and linked to care, 12,442 (88%) were still in care, 12,221 (86%) had started cART, and 11,678 (82%) had a most recent HIV RNA below 200 copies/ml, or 91-95-96 in terms of the UNAIDS 90-90-90 target (*Figure 1.15B*). In total, 9,065 (73%, or 78% of those with a CD4 measurement) of MSM with a suppressed viral load had a CD4 count of 500 cells/mm^3 or higher at their last measurement in 2016 or 2017. Among women and other men, the proportion with a most recent HIV RNA below 200 copies/ml in 2017 was lower than in MSM (*Appendix Figure 1.3*).

Continuum of care by region of origin, age, and residence

Individuals of Dutch origin generally reached higher rates of engagement in the various stages of the care continuum than people originating from abroad (*Appendix Figure 1.4*). Moreover, the proportion of people who were still in care by the end of 2017 was similar between age groups, while the proportion who had started antiretroviral treatment increased from 86% of those diagnosed and linked to care among 18 to 24 year olds to 97% of those aged 65 years or above (*Appendix Figure 1.5*). As a consequence, the proportion of people with viral suppression increased with age and was 77% among those aged 18 to 24 years and 93% in people 65 years of age or older, or 83% and 95%, respectively, of those who were still in care. Overall, engagement in the various stages of the care continuum was very similar between the 25 public health service regions in the Netherlands (*Appendix Table 1.5*).

Continuum of care 2016

We also re-estimated the continuum of HIV care for 2016 and found that, by the end of that year, 22,900 (22,700-23,300) people were living with HIV in the Netherlands, which was similar to the estimated 22,900 (22,400-23,400) reported in last year's Monitoring Report (*Figures 1.15C* and *1.15D*)[4]. While the number diagnosed and the number retained in care were very similar to last year's report, the number of those who started antiretroviral treatment (18,726 compared to 18,599 last year) and the number with viral suppression (17,987 compared to 17,580) were somewhat higher in this year's report. This is due to a backlog in the collection of data on start of treatment and on viral load measurements; this backlog may also be present in the reported continuum of HIV care for 2017. As a result, the estimate for the UNAIDS 90-90-90 target changed from 89-92-95 in last year's report to 89-92-96 in this year's report.

Conclusion

Since 2008 there has been a steady decrease in the annual number of new HIV diagnoses to less than 900 new diagnoses in most recent years. This decreasing trend continued in 2017 with approximately 750 new diagnoses in that year, although there is some uncertainty concerning this number of diagnoses because not all people diagnosed in 2017 have yet been included in the SHM database at the time of writing. The decrease in HIV diagnoses is, in part, a consequence of a decrease in the estimated annual number of newly-acquired HIV infections.

In addition, there were significant decreases in the time from infection to diagnosis and in the time to reaching other stages in the HIV care continuum. As a result, HIV-positive people are being diagnosed increasingly earlier in the course of their infection. Furthermore, a gradually decreasing proportion of individuals are diagnosed with CD4 counts below 350 cells/mm^3. Conversely, the proportion diagnosed with evidence of a recent infection is increasing, although this is more evident among MSM than among other men and among women. In most recent calendar years, however, the downward trend in the proportion of MSM presenting with late or advanced HIV infection appears to have halted.

In recent years, testing for HIV appears to have become more frequent, because individuals with a positive test are more likely to have had a previous negative test. Testing rates appear to be highest among people who received a positive test result at a sexual health centre and lowest in those tested in a hospital. In addition, the population that tested positive for HIV in a hospital had the highest proportion of

late presenters. These observations illustrate that people tested at sexual health centres are more likely actively seeking testing for HIV on a regular basis than people diagnosed in a hospital, who are more likely to be tested because they have a condition that may be caused by HIV.

People tested early in their infection generally start treatment earlier and with CD4 counts above 350 cells/mm^3. In the most recent years, treatment uptake has also increased in individuals with high CD4 cells such that, in 2017, more than 90% of individuals diagnosed with CD4 cells above 500 cells/mm^3 were on cART within 6 months after entering HIV care. As a result of earlier treatment, in combination with increased testing and earlier diagnosis and a decreasing number of newly acquired HIV infections, the Netherlands has already reached the UNAIDS 90-90-90 targets for 2020 with the current estimate standing at 90-93-95. Hence, it is now time to aim for the next set of goals by UNAIDS: 95-95-95 by 2030[9].

Recommendations

A re-assessment of the continuum of HIV care for 2016 showed that there was an increase in the number of people on ART and in the number who achieved viral suppression by the end of that year compared to what was reported in last year's report. However, the difference between the number of people with viral suppression in this year's re-appraisal of 2016 and that reported last year was considerably smaller. This is most likely the result of having extended the automated import of laboratory measurements (LabLink) to 14 HIV treatment centres, which cover approximately 69% of all people followed by SHM. Nevertheless, to better monitor progress towards achieving UNAIDS' 95-95-95 goals for 2030, a more timely registration of start of treatment and viral load measurements would be needed. The latter could be markedly improved by further extending LabLink to all HIV treatment centres in the Netherlands.

The decrease in the number of new HIV diagnoses may in part be the result of the positive developments mentioned above, i.e., more testing, earlier diagnosis, earlier start of treatment, a large proportion of people with viral suppression, and a smaller number living with undiagnosed HIV. To fully curb the epidemic and achieve a sustained further reduction in the number of new HIV infections, treatment, prevention, and especially testing need to be scaled up even further. A major step towards achieving this goal would be to reconsider the current restrictions on community-based and home-based HIV testing, as well as increasing awareness of sexual risk behaviour and extending the existing armoury of prevention measures with pre-exposure prophylaxis. The recent decision by the

Ministry of Health to make pre-exposure prophylaxis available to those at highest risk of acquiring HIV is therefore a very rational and welcome addition to our combination prevention toolbox in the Netherlands.

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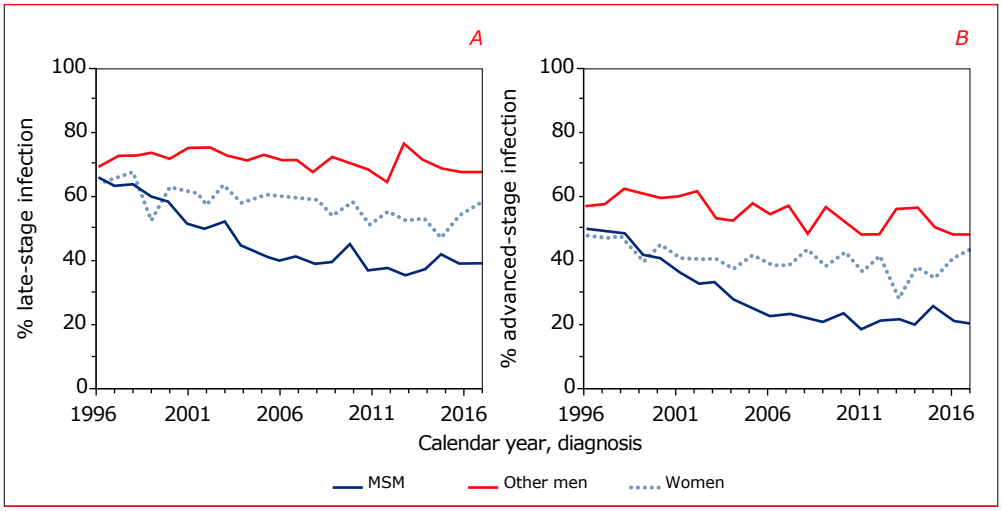
Appendix: supplementary figures and tables

Appendix Figure 1.1: *Proportion of people classified as presenting with (A) late-stage or (B) advanced-stage HIV infection at the time of HIV diagnosis. From 1996 (2015) onwards, 52% (48%) were diagnosed with late-stage HIV infection: men who have sex with men (MSM) 44% (41%), other men 72% (68%), and women 59% (53%). Overall, 34% (30%) were diagnosed with advanced-stage HIV infection: MSM 26% (22%), other men 55% (49%), and women 40% (40%). Late-stage HIV infection: CD4 counts below 350 cells/mm³ or having AIDS, regardless of CD4 count. Advanced-stage HIV infection: CD4 counts below 200 cells/mm³ or having AIDS.*



Legend: *MSM=men who have sex with men.*

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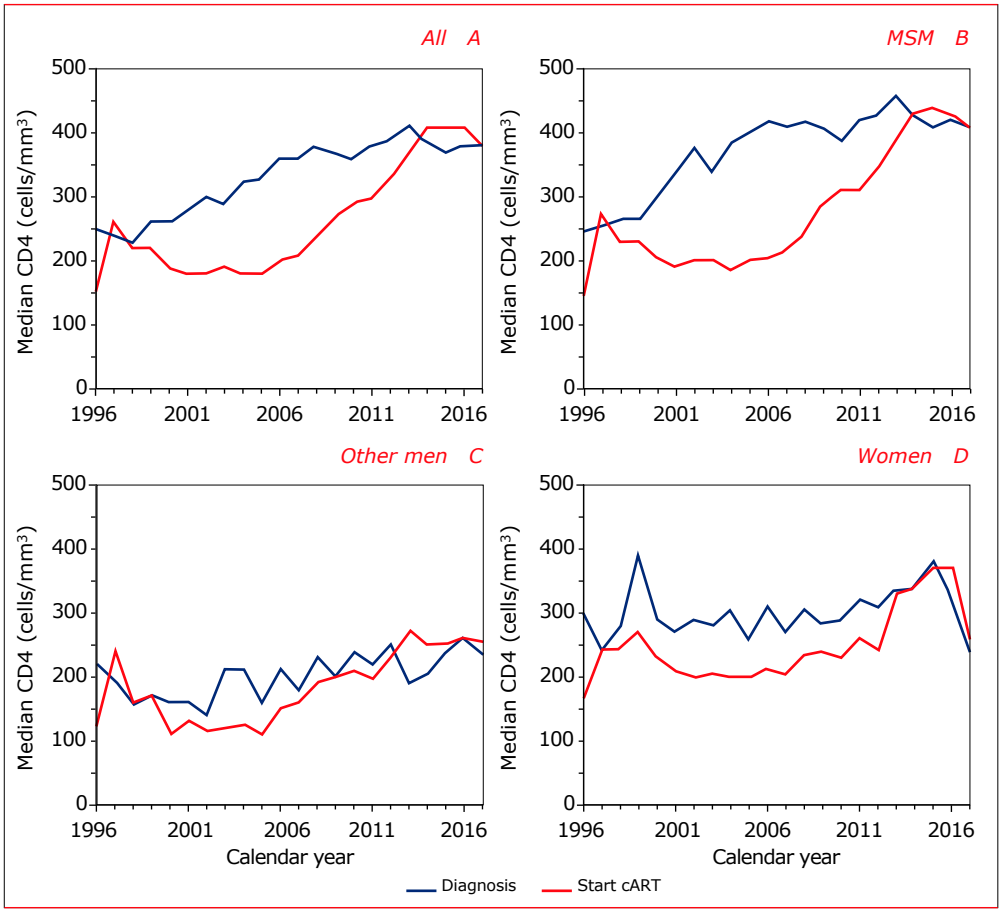
Appendix Figure 1.2: *Changes over calendar time in median CD4 counts at HIV diagnosis and at the start of combination antiretroviral therapy (cART) for (A) all individuals with an HIV-1 diagnosis, and for (B) men who have sex with men, (C) other men, and (D) women. The lines in each panel are a combination of Figures 1.9A and 1.9B.*



Legend: *cART=combination antiretroviral therapy.*

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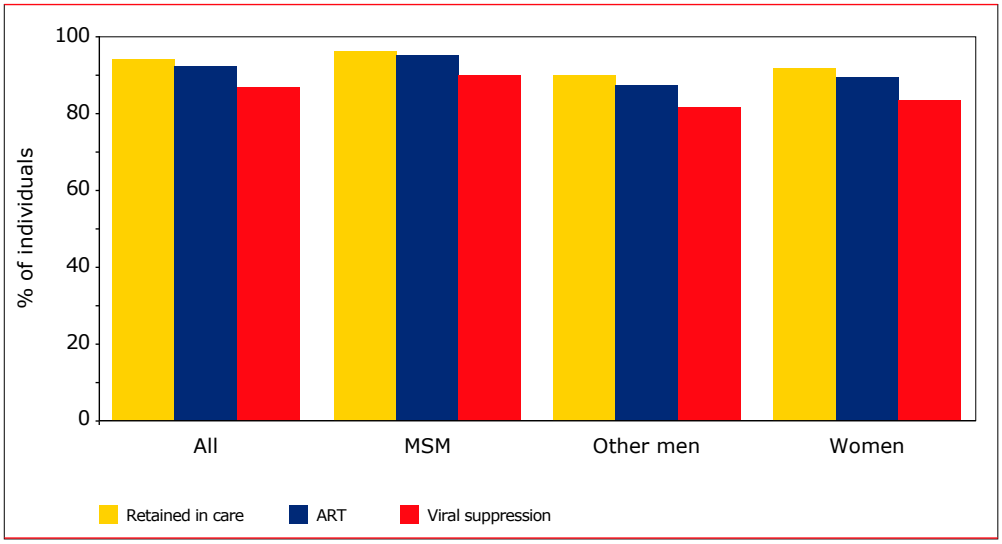
Appendix Figure 1.3: *Continuum of HIV care by transmission risk group. Proportions are given relative to the number of people diagnosed and linked to care.*



Legend: *MSM=men who have sex with men; ART=antiretroviral therapy.*

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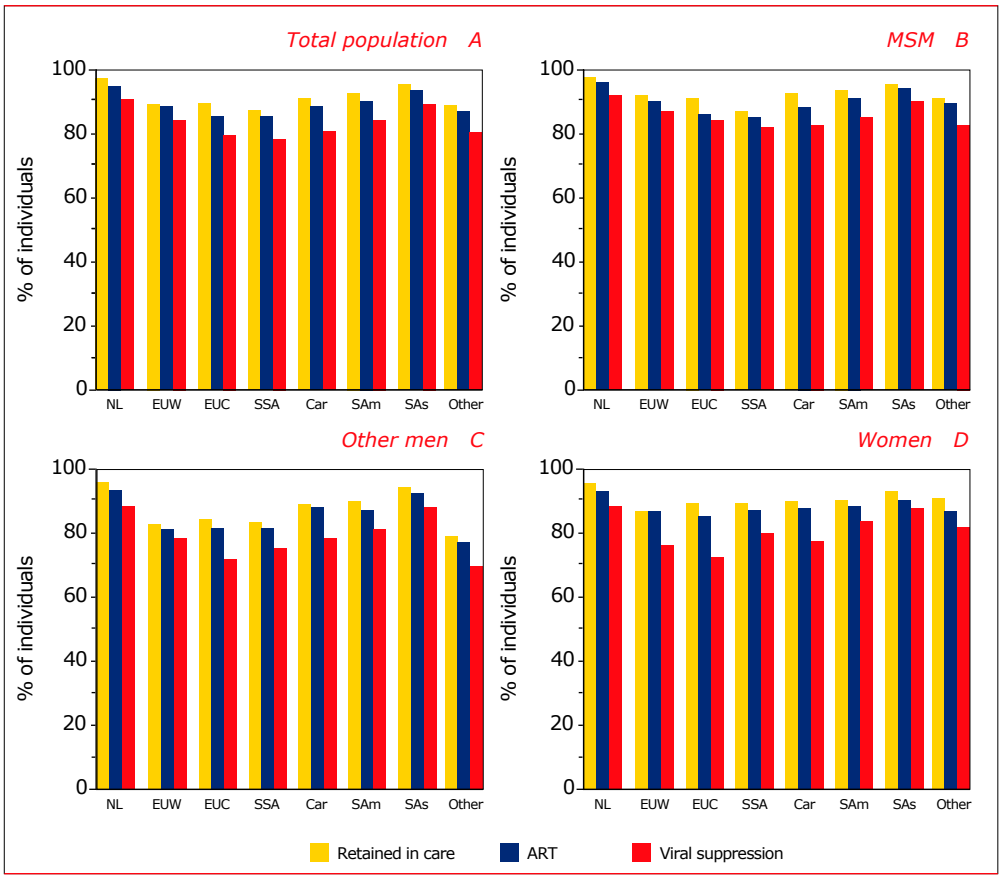
Appendix Figure 1.4: *Continuum of HIV care by region of origin for (A) the total HIV-1-positive population and for (B) men who have sex with men, (C) other men, and (D) women. Proportions are given relative to the number of people diagnosed and linked to care.*



Legend: *NL=the Netherlands; EUW=western Europe; EUC=central Europe; SSA=sub-Saharan Africa; Car=Caribbean; SAm=South America; SAs=South and south and south-east Asia; Other=other regions of origin; cART=combination antiretroviral therapy.*

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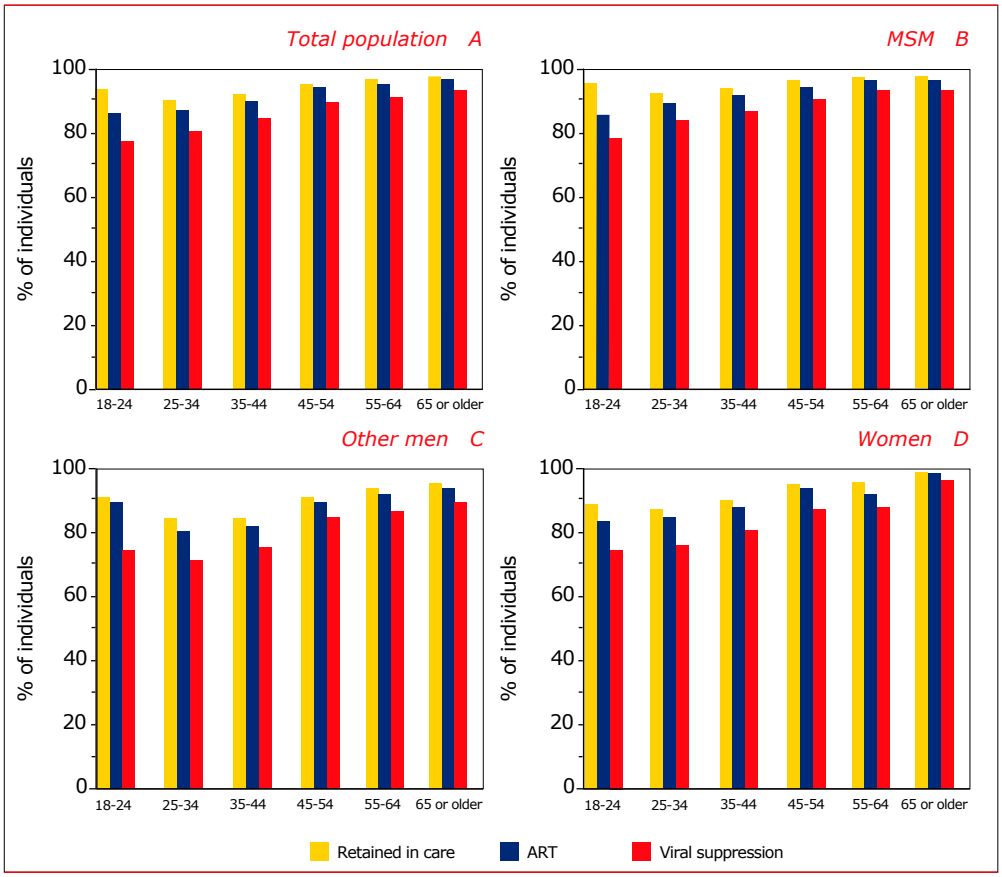
Appendix Figure 1.5: *Continuum of HIV care by age group for (A) the total HIV-1-positive population and for (B) men who have sex with men, (C) other men, and (D) women. Proportions are given relative to the number of people diagnosed and linked to care.*



Legend: *ART=antiretroviral therapy.*

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Appendix Table 1.1: *Annual number of HIV-1 diagnoses among children and among adults per transmission risk group, including men who have sex with men (MSM) and individuals who acquired their HIV infection via heterosexual contact, injecting drug use (IDU), contact with contaminated blood, or other or unknown modes of transmission. Note: data collection for 2016 and 2017 had not yet been finalised at the time of writing.*

	MSM	Heterosexual		IDU	
Year of diagnosis	**Men**	**Men**	**Women**	**Men**	**Women**
≤1995	2,284	270	395	284	136
1996	386	90	83	31	8
1997	449	114	127	39	10
1998	334	108	113	23	7
1999	357	108	138	20	8
2000	382	163	195	18	5
2001	452	167	219	16	5
2002	474	168	251	16	3
2003	465	178	279	23	5
2004	591	204	264	11	4
2005	647	195	266	17	2
2006	692	164	201	10	5
2007	783	158	215	12	4
2008	870	178	181	6	1
2009	791	159	183	9	0
2010	802	181	168	6	1
2011	784	144	150	4	1
2012	732	148	149	6	1
2013	751	117	132	2	2
2014	626	111	119	1	0
2015	584	129	124	2	0
2016	523	101	103	1	0
*2016**	*539*	*104*	*106*	*1*	*0*
2017	465	81	76	2	0
*2017**	*516*	*90*	*84*	*2*	*0*
2018	57	5	8	0	0
Total	**15,281**	**3,441**	**4,139**	**559**	**208**

**Projected numbers*

Legend: *MSM: men who have sex with men; IDU: injecting drug use.*

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Blood or blood products		Other/unknown		Children		Total
Men	Women	Men	Women	Men	Women	
63	23	159	47	53	37	3,751
3	4	35	6	14	3	663
7	3	39	9	9	9	815
6	6	30	7	8	8	650
9	4	19	6	11	13	693
3	4	36	4	16	29	855
8	7	39	6	15	34	968
15	7	59	4	18	21	1,036
12	3	57	13	17	21	1,073
4	4	65	9	14	12	1,182
3	8	61	8	11	10	1,228
5	7	56	3	7	11	1,161
2	6	49	7	9	13	1,258
5	3	54	6	13	17	1,334
3	2	48	9	13	15	1,232
6	2	41	6	20	16	1,249
9	7	60	4	14	9	1,186
4	3	40	9	8	13	1,113
12	1	41	5	6	4	1,073
7	5	42	7	5	6	929
6	1	44	5	6	5	906
10	2	33	4	4	4	785
10	*2*	*34*	*4*	*4*	*4*	*809*
7	2	32	6	3	1	675
8	*2*	*36*	*7*	*3*	*1*	*749*
1	2	9	0	0	0	82
210	**116**	**1,148**	**190**	**294**	**311**	**25,897**

Appendix Table 1.2: *Region of origin of the 25,292 adult HIV-1-positive individuals with a recorded date of diagnosis stratified according to year of HIV diagnosis.*

	MSM			Other men		
	<2015	≥2015	Total	<2015	≥2015	Total
The Netherlands	9,555	1,027	10,582	2,147	268	2,415
	70.0%	63.0%	69.2%	43.9%	57.9%	45.1%
Sub-Saharan Africa	197	32	229	1,301	81	1,382
	1.4%	2.0%	1.5%	26.6%	17.5%	25.7%
Western Europe	1,091	83	1,174	284	11	293
	8.0%	5.1%	7.7%	5.8%	2.4%	5.5%
Central Europe	292	91	383	153	24	177
	2.1%	5.6%	2.5%	3.1%	5.2%	3.3%
Eastern Europe	99	14	113	67	4	71
	0.7%	0.9%	0.7%	1.4%	0.9%	1.3%
South America	930	118	1,048	393	28	421
	6.8%	7.2%	6.9%	8.0%	6.0%	7.9%
Caribbean	496	96	592	212	18	230
	3.6%	5.9%	3.9%	4.3%	3.9%	4.3%
South and south-east Asia	408	55	463	123	9	132
	3.0%	3.4%	3.0%	2.5%	1.9%	2.5%
Other/unknown	584	113	697	215	20	235
	4.3%	6.9%	4.6%	4.4%	4.3%	4.4%

Legend: *MSM=men who have sex with men.*

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	Women		
	<2015	≥2015	Total
	1,159	127	1,286
	26.8%	38.1%	27.6%
	1,850	100	1,950
	42.8%	30.0%	41.9%
	227	5	232
	5.3%	1.5%	5.0%
	84	13	97
	1.9%	3.9%	2.1%
	51	5	56
	1.2%	1.5%	1.2%
	397	31	428
	9.2%	9.3%	9.2%
	218	12	230
	5.0%	3.6%	4.9%
	254	25	279
	5.9%	7.5%	6.0%
	80	15	95
	1.9%	4.5%	2.0%

Appendix Table 1.3: *Late presentation in the 2,828 individuals presenting for care in 2015 or later. In total, 103 individuals (78 MSM, 11 other men, and 14 women) could not be classified as a result of missing CD4 cell count at entry into care.*

	MSM (n=1,781)		Other men (n=536)		Women (n=408)		Total (n=2,725)	
	n	%	n	%	n	%	n	%
Overall	680	38	337	63	195	48	1,212	44
Age at entry [years]								
18-24	50	23	13	48	9	26	72	26
25-34	177	31	72	49	56	44	305	36
35-44	162	39	82	67	55	47	299	46
45-54	156	44	91	68	44	59	291	52
55-64	95	56	52	72	23	55	170	60
≥65	40	71	27	77	8	73	75	74
Region of origin								
The Netherlands	414	41	184	66	59	46	657	46
Sub-Saharan Africa	21	57	68	65	70	51	159	57
Western Europe	33	27	10	45	4	33	47	30
Central Europe	27	27	17	53	7	44	51	34
South America	54	36	17	61	20	49	91	41
Caribbean	55	44	12	48	2	17	69	42
South and South-East Asia	31	48	10	100	19	59	60	56
North Africa and Middle East	17	28	10	63	2	40	29	35
Location of testing								
Sexual health centre	156	24	18	46	10	33	184	26
Hospital	210	70	188	80	93	78	491	75
General practice	196	43	70	52	40	41	306	44
Other	20	31	8	50	26	42	54	38

Legend: *MSM=men who have sex with men.*

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Appendix Table 1.4: Characteristics of the 19,582 people living with HIV and in care as of December 2017.

	MSM	Heterosexual		IDU	
	Men	Men	Women	Men	Women
	n=12,378	n=2,417	n=3,175	n=216	n=76
Current age [years]					
0–12	0	0	0	0	0
	0.0%	0.0%	0.0%	0.0%	0.0%
13–17	2	0	1	0	0
	0.0%	0.0%	0.0%	0.0%	0.0%
18–24	208	13	43	1	0
	1.7%	0.5%	1.4%	0.5%	0.0%
25–34	1,489	222	443	4	1
	12.0%	9.2%	14.0%	1.9%	1.3%
35–44	2,543	448	958	33	9
	20.5%	18.5%	30.2%	15.3%	11.8%
45–54	4,109	860	1,048	79	25
	33.2%	35.6%	33.0%	3.6%	32.9%
55–64	2,794	599	478	87	38
	22.6%	24.8%	15.1%	40.3%	50.0%
65–74	1,064	222	158	12	3
	8.6%	9.2%	5.0%	5.6%	3.9%
≥75	169	53	46	0	0
	1.4%	2.2%	1.4%	0.0%	0.0%
Current age 50 years or older					
No	6,101	1,123	2,047	69	16
	49.3%	46.5%	64.5%	31.9%	21.1%
Yes	6,277	1,294	1,128	147	60
	50.7%	53.5%	35.5%	68.1%	78.9%
Current age 60 years or older					
No	10,113	1,913	2,805	171	59
	81.7%	79.1%	88.3%	79.2%	77.6%
Yes	2,265	504	370	45	17
	18.3%	20.9%	11.7%	20.8%	22.4%

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Blood or blood products		Other / unknown		Total	
Men	Women	Men	Women	Men	Women
n=166	n=95	n=794	n=265	n=15,971	n=3,611
0	0	56	7	56	72
0.0%	0.0%	7.1%	27.2%	0.4%	2.0%
1	0	37	23	40	24
0.6%	0.0%	4.7%	8.7%	0.3%	0.7%
5	3	41	42	268	88
3.0%	3.2%	5.2%	15.8%	1.7%	2.4%
20	7	82	33	1,817	484
12.0%	7.4%	10.3%	12.5%	11.4%	13.4%
26	26	115	31	3,165	1,024
15.7%	27.4%	14.5%	11.7%	19.8%	28.4%
55	28	210	35	5,313	1,136
33.1%	29.5%	26.4%	13.2%	33.3%	31.5%
32	22	154	24	3,666	562
19.3%	23.2%	19.4%	9.1%	23.0%	15.6%
21	6	80	4	1,399	171
12.7%	6.3%	10.1%	1.5%	8.8%	4.7%
6	3	19	1	247	50
3.6%	3.2%	2.4%	0.4%	1.5%	1.4%
76	53	445	216	7,804	2,332
45.8%	55.8%	54.8%	81.5%	48.9%	64.6%
90	42	359	49	8,167	1,279
54.2%	44.2%	45.2%	18.5%	51.1%	35.4%
129	78	636	250	12,962	3,192
77.7%	82.1%	80.1%	94.3%	81.2%	88.4%
37	17	158	15	3,009	419
22.3%	17.9%	19.9%	5.7%	18.8%	11.6%

	MSM	Heterosexual		IDU	
	Men	Men	Women	Men	Women
	n=12,378	n=2,417	n=3,175	n=216	n=76
Region of origin					
Netherlands	8,898	1,145	941	125	36
	71.9%	47.4%	29.6%	57.9%	47.4%
Sub-Saharan Africa	166	648	1,318	4	0
	1.3%	26.8%	41.5%	1.9%	0.0%
Western Europe	761	82	69	24	25
	6.1%	3.4%	2.2%	11.1%	32.9%
South America	803	215	315	9	0
	6.5%	8.9%	9.9%	4.2%	0.0%
Caribbean	494	126	166	5	1
	4.0%	5.2%	5.2%	2.3%	1.3%
South and south-east Asia	379	38	219	9	1
	3.1%	1.6%	6.9%	4.2%	1.3%
Other	828	157	139	40	13
	6.7%	6.5%	4.4%	18.5%	17.1%
Unknown	49	6	8	0	0
	0.4%	0.2%	0.3%	0.0%	0.0%
Years aware of HIV infection					
<1	448	80	74	2	0
	3.6%	3.3%	2.3%	0.9%	0.0%
1-2	1,028	207	215	3	0
	8.3%	8.6%	6.8%	1.4%	0.0%
3-4	1,279	185	215	0	2
	10.3%	7.7%	6.8%	0.0%	2.6%
5-10	3,511	628	672	11	3
	28.4%	26.0%	21.2%	5.1%	3.9%
10-20	4,137	1,047	1,560	75	17
	33.4%	43.3%	49.1%	34.7%	22.4%
>20	1,969	267	426	125	54
	15.9%	11.0%	13.4%	57.9%	71.1%
Unknown	6	3	13	0	0
	0.0%	0.1%	0.4%	0.0%	0.0%
Current CD4 count [cells/mm^3], median / IQR	690	590	680	545	695
	520-889	412-810	493-892	371-819	402-894
Current CD8 count [cells/mm^3], median / IQR	870	830	770	835	881
	640-1,180	590-1,140	570-1,050	582-1,210	680-1,156

Blood or blood products		Other / unknown		Total	
Men	Women	Men	Women	Men	Women
n=166	n=95	n=794	n=265	n=15,971	n=3,611
104	18	365	103	10,637	1,098
62.7%	18.9%	46.0%	38.9%	66.6%	30.4%
31	39	221	96	1,070	1,453
18.7%	41.1%	27.8%	36.2%	6.7%	40.2%
4	4	33	26	904	124
2.4%	4.2%	4.2%	9.8%	5.7%	3.4%
5	10	38	5	1,070	330
3.0%	10.5%	4.8%	1.9%	6.7%	9.1%
5	5	33	0	663	172
3.0%	5.3%	4.2%	0.0%	4.2%	4.8%
8	13	28	5	462	238
4.8%	13.7%	3.5%	1.9%	2.9%	6.6%
9	6	74	28	1,108	186
5.4%	6.3%	9.3%	10.6%	6.9%	5.2%
0	0	2	2	57	10
0.0%	0.0%	0.3%	0.8%	0.4%	0.3%
6	2	27	6	563	82
3.6%	2.1%	3.4%	2.3%	3.5%	2.3%
16	3	73	12	1,327	230
9.6%	3.2%	9.2%	4.5%	8.3%	6.4%
15	5	73	17	1,552	239
9.0%	5.3%	9.2%	6.4%	9.7%	6.6%
24	13	181	78	4,355	766
14.5%	13.7%	22.8%	29.4%	27.3%	21.2%
48	48	316	100	5,623	1,725
28.9%	50.5%	39.8%	37.7%	35.2%	47.8%
54	24	113	48	2,528	552
32.5%	25.3%	14.2%	18.1%	15.8%	15.3%
3	0	11	4	23	17
1.8%	0.0%	1.4%	1.5%	0.1%	0.5%
605	734	599	810	670	690
387–800	525–947	410–840	610–1,120	491–870	500–910
753	877	837	760	860	770
552–1,100	610–1,050	599–1,160	516–1,047	630–1,180	570–1,060

	MSM	Heterosexual		IDU	
	Men	Men	Women	Men	Women
	n=12,378	n=2,417	n=3,175	n=216	n=76
Current HIV RNA <200 copies/ml					
No	361	102	179	7	4
	2.9%	4.2%	5.6%	3.2%	5.3%
Yes	11,631	2,218	2,897	191	67
	94.0%	91.8%	91.2%	88.4%	88.2%
Current HIV RNA <100 copies/ml					
No	462	130	223	8	6
	3.7%	5.4%	7.0%	3.7%	7.9%
Yes	11,530	2,190	2,853	190	65
	93.1%	90.6%	89.9%	88.0%	85.5%
Ever AIDS	2,340	783	753	85	30
	18.9%	32.4%	23.7%	39.4%	39.5%
AIDS at diagnosis	1,221	547	432	19	6
	9.9%	22.6%	13.6%	8.8%	7.9%
Current treatment					
cART	12,168	2,362	3,105	212	76
	98.3%	97.7%	97.8%	98.1%	100.0%
Non-cART	20	2	4	0	0
	0.2%	0.1%	0.1%	0.0%	0.0%
Not started	189	53	66	4	0
	1.5%	2.2%	2.1%	1.9%	0.0%

Legend: *MSM: men who have sex with men; IDU: injecting drug use; IQR: inter-quartile range; cART=combination antiretroviral therapy.*

	Blood or blood products		Other / unknown		Total	
	Men	Women	Men	Women	Men	Women
	n=166	n=95	n=794	n=265	n=15,971	n=3,611
	9	7	50	18	529	208
	5.4%	7.4%	6.3%	6.8%	3.3%	5.8%
	154	86	722	238	14,9186	3,288
	92.8%	90.5%	90.9%	89.8%	93.4%	91.1%
	10	11	60	20	670	260
	6.0%	11.6%	7.6%	7.5%	4.2%	7.2%
	153	82	712	236	14,775	3,236
	92.2%	86.3%	89.7%	89.1%	92.5%	89.6%
	57	31	303	85	3,568	899
	34.3%	32.6%	38.2%	32.1%	22.3%	24.9%
	34	18	213	43	2,034	499
	20.5%	18.9%	26.8%	16.2%	12.7%	13.8%
	158	94	777	262	15,677	3,537
	95.2%	98.9%	97.9%	98.9%	98.2%	98.0%
	0	1	1	1	23	6
	0.0%	1.1%	0.1%	0.4%	0.1%	0.2%
	8	0	16	2	270	68
	4.8%	0.0%	2.0%	0.8%	1.7%	1.9%

Appendix Table 1.5: *Continuum of HIV care for the total HIV-1-positive population in the Netherlands diagnosed and linked to care, stratified by Public Health Service region in which people were living by the end of 2017. Proportions are given relative to the number of people diagnosed and linked to care.*

	Diagnosed and linked to care	Retained in care	
	n	n	%
Groningen	564	531	94
Fryslân	325	307	94
Drenthe	268	249	93
IJsselland	315	303	96
Twente	407	391	96
Noord- en Oost-Gelderland	439	422	96
Gelderland-Midden	662	639	97
Gelderland-Zuid	378	363	96
Flevoland	546	502	92
Regio Utrecht	1,179	1,113	94
Gooi & Vechtstreek	294	281	96
Hollands-Noorden	422	395	94
Zaanstreek-Waterland	347	339	98
Amsterdam	6,027	5,723	95
Kennemerland	567	533	94
Hollands-Midden	523	493	94
Haaglanden	1,582	1,502	95
Rotterdam-Rijnmond	2,419	2,242	93
Dienst Gezondheid & Jeugd ZHZ	304	282	93
Zeeland	206	189	92
West-Brabant	521	493	95
Hart voor Brabant	807	762	94
Brabant-Zuidoost	616	575	93
Limburg-Noord	356	335	94
Zuid-Limburg	500	479	96
Unknown	272	232	85
Total	**20,844**	**19,675**	**94**

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	Antiretroviral treatment		Viral suppression	
	n	%	n	%
	516	92	489	87
	304	93	286	88
	241	90	225	84
	297	94	292	93
	386	95	373	92
	409	93	399	91
	622	94	610	92
	359	95	327	87
	491	90	458	84
	1,068	91	1,063	90
	277	94	270	92
	382	90	371	88
	336	97	313	90
	5,645	94	5,321	88
	531	94	467	82
	481	92	463	89
	1,482	94	1,415	89
	2,169	90	2,011	83
	267	88	262	86
	184	89	163	79
	483	93	461	89
	758	94	713	88
	570	93	540	88
	331	93	311	88
	473	95	451	90
	228	84	214	79
	19,289	**93**	**18,270**	**88**