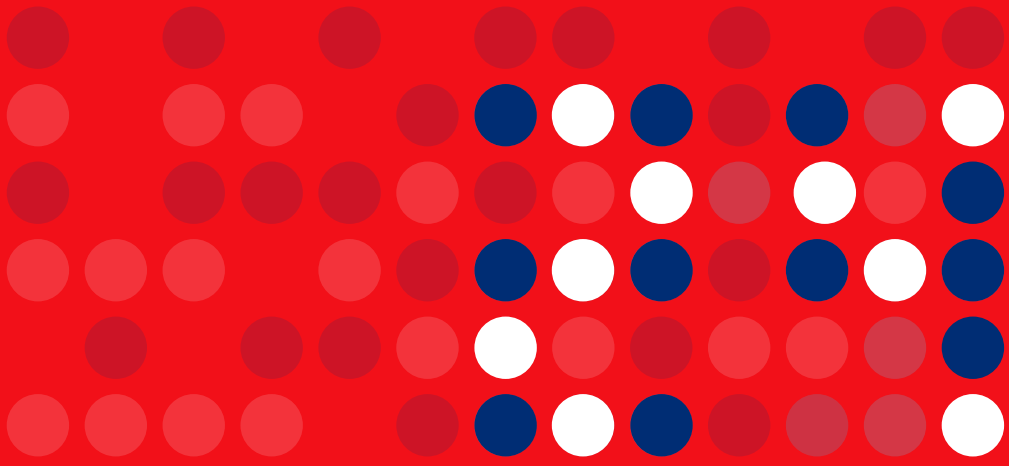
Human Immunodeficiency Virus (HIV)
Infection in the Netherlands

HIV Monitoring

HIV Monitoring Report 2024

Pre-publication chapter 1:
HIV in the Netherlands



1. HIV in the Netherlands

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Introduction

By May 2024, stichting hiv monitoring (SHM) had registered 35,017 individuals with HIV. The vast majority of these (34,044, or 97.2%) agreed to the collection of further clinical data once registered, whereas 973 (2.8%) declined to take part. Among those whose clinical data is collected, most (32,821) are registered with one of the HIV treatment centres in the Netherlands (*Figure 1.1*) while 1,458 are registered with the Curaçao Medical Center in Willemstad, Curaçao (see *Chapter 11*) and 22 with the Horacio Oduber Hospital in Oranjestad, Aruba.

Of those registered in the Netherlands, the vast majority were diagnosed with HIV-1 (31,535, or 96%). Only 102 people were diagnosed with HIV-2, while 61 individuals were found to carry antibodies against both HIV-1 and HIV-2. Data is limited for individuals registered before the start of the AIDS Therapy Evaluation in the Netherlands (ATHENA) study, which accounts for the absence of serological information for most of the remaining 1,123.

***Box 1.1:** Infection, diagnosis, entry into care, and registration*

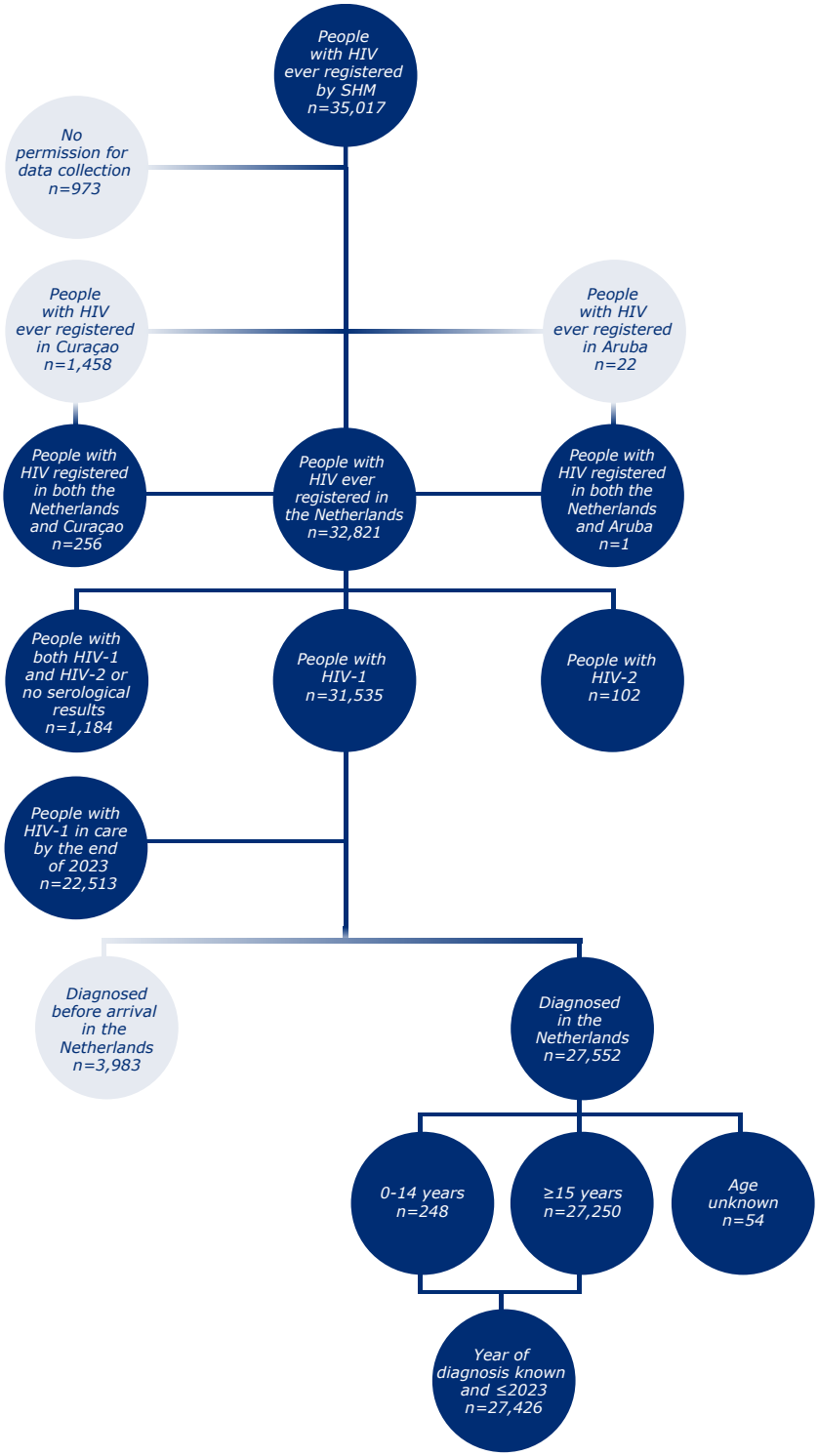
Infection	The moment an individual acquires HIV. The time of infection is often unknown.
Diagnosis	The moment an HIV infection in an individual is confirmed by blood tests. The time of diagnosis can be weeks, months, or years after infection.
Entry into care	The moment an individual with HIV first receives care at an HIV treatment centre. This usually takes place within a few weeks of HIV diagnosis.
Registration	The moment an HIV physician or nurse notifies SHM of an individual with HIV (in care) and the individual's details are recorded in the SHM database. Registration usually takes place within a few months of entering care, but can take longer. Demographic and clinical data from the time of HIV diagnosis can only be collected after registration.

HIV-1

Individuals with HIV-1

Of the 31,535 individuals in the Netherlands who were ever diagnosed with HIV-1, 3,983 (13%) were born abroad and had a documented HIV diagnosis prior to arrival in the Netherlands (*Figure 1.1*). These 3,983 individuals have been excluded from the analyses on newly diagnosed individuals later in this section. The remaining 27,552 individuals were newly diagnosed while living in the Netherlands, or their date of arrival in the country has not yet been recorded in the SHM database.

Figure 1.1: *Overview of the population with HIV registered by stichting hiv monitoring (SHM).*



Individuals diagnosed before arriving in the Netherlands

Of the 3,983 individuals who were born abroad and had a documented HIV-1 diagnosis before arriving in the Netherlands, 1,198 (30%) arrived in the Netherlands in 2021-2023, including 314 in 2023 (*Figure 1.2A*). So far, SHM has registered 589 migrants who arrived in 2022, which is an increase of 92% compared with the average annual number of 307 migrants in the other years in the period 2018-2023. Information on diagnosis abroad and date of arrival in the Netherlands has been recorded for all newly registered individuals since early 2018, but is not yet available for everyone included in the SHM database.

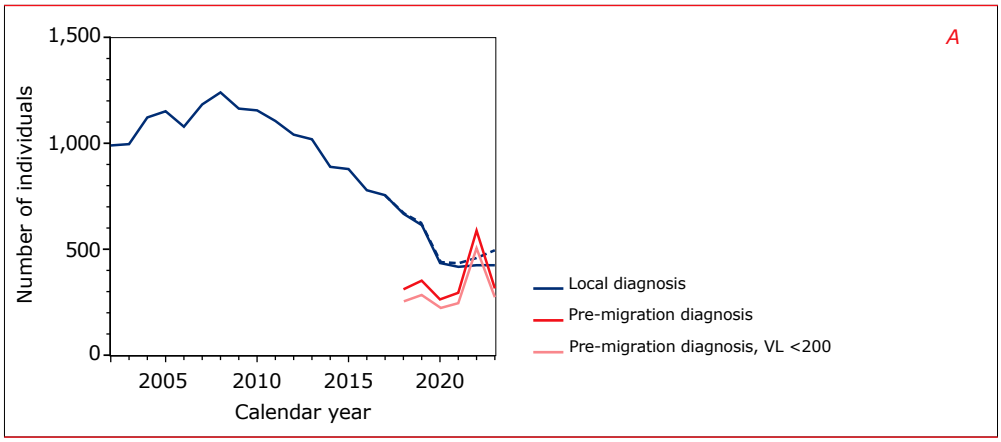
Of the 1,198 migrants who arrived in 2021-2023 with a documented pre-arrival HIV diagnosis, 607 (51%) were men who have sex with men (MSM), 260 (22%) were other men, 295 (25%) were women, and 36 (3%) were trans people. The median age at the time of arrival was 36 years (interquartile range [IQR] 30-43); 103 (9%) were below 25 years of age, including 12 children under the age of 15, while 122 (10%) were 50 years of age or older. In terms of geographic origins, migrants arrived from:

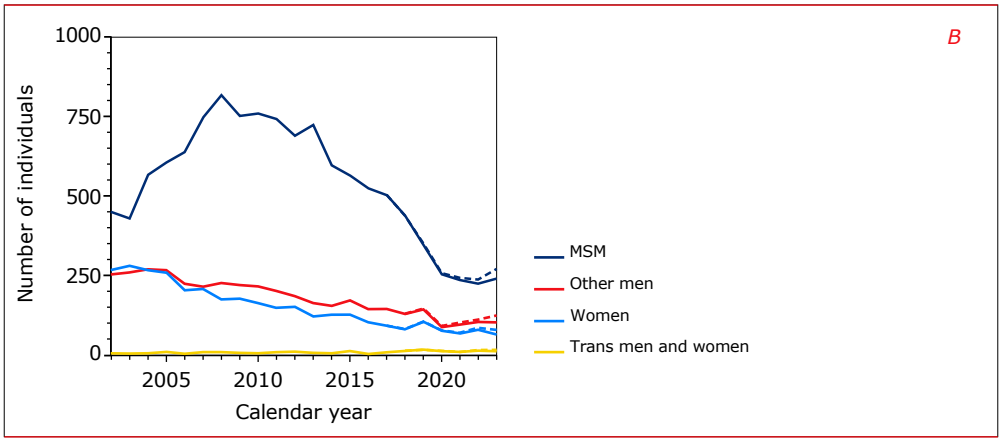
- eastern Europe (385, 32%);
- South America (212, 18%);
- sub-Saharan Africa (138, 12%);
- central Europe (103, 9%);
- western Europe (90, 8%);
- Caribbean (88, 7%);
- north Africa and Middle East (63, 5%);
- south and southeast Asia (61, 5%); and
- other regions (58, 5%).

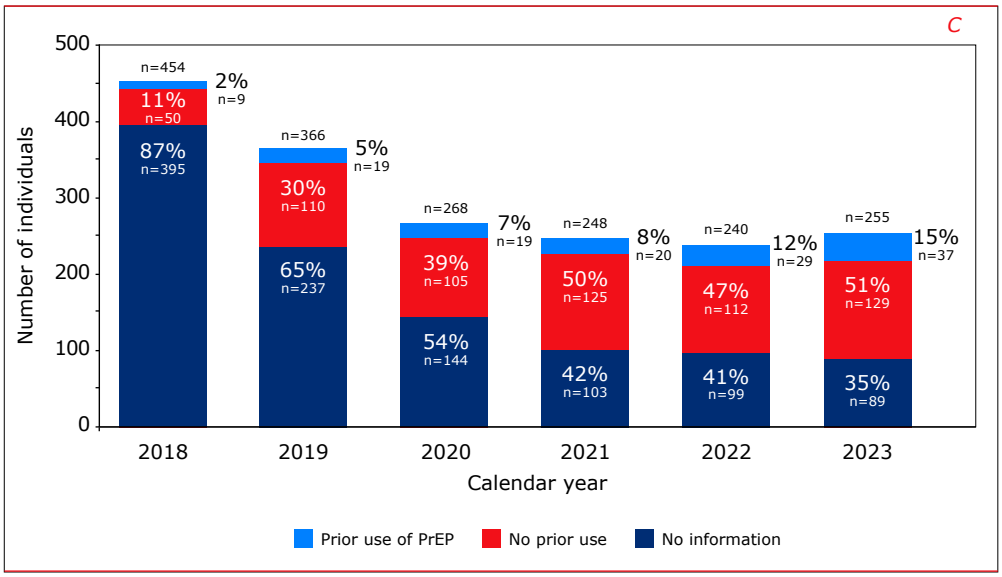
The most commonly reported countries of origin (from where at least 25 individuals with HIV arrived in the Netherlands) were Ukraine (285, 24%), Brazil (68, 6%), Russian Federation (63, 5%), Colombia (53, 4%), Poland (50, 4%), Curaçao (45, 4%), and Turkey (31, 3%). Individuals from Ukraine and the Russian Federation accounted for 237 (40%) and 36 (6%), respectively, of the 589 migrants arriving in 2022; these numbers decreased to 44 (14%) and 12 (4%), respectively, in 2023.

The majority (1,079, or 90%) of the 1,198 migrants had already started antiretroviral therapy (ART) before arriving in the Netherlands. By the time they entered HIV care in the Netherlands, their median CD4 counts were 655 (IQR 440-870) cells/mm^3, while 1,046 individuals had HIV RNA levels below 1,000 copies/ml (88% of the 1,188 who had an available viral load measurement), including 1,024 individuals with RNA levels below 200 copies/ml (86% of the 1,188 with a viral load measurement).

Figure 1.2: *(A) Annual number of individuals newly diagnosed with HIV-1 in the Netherlands (by year of diagnosis) or with documented diagnosis abroad before moving to the Netherlands (by year of arrival), (B) annual number of individuals newly diagnosed with HIV-1 in the Netherlands and aged 15 years or older at the time of diagnosis, according to key population, and (C) annual number of new diagnoses in men who have sex with men (MSM) and trans men and women stratified by whether or not prior use of PrEP was reported. In 2023, MSM accounted for 57% of the annual number of new diagnoses, other men for 24%, women for 16%, and trans men and women for 3%. Dashed lines indicate the number of diagnoses after adjusting for a delay in notification to SHM. VL <200: individuals with documented diagnosis abroad before moving to the Netherlands who already had a suppressed viral load below 200 copies/ml by the time they entered HIV care in the Netherlands.*







Legend: *MSM = men who have sex with men; VL = viral load; PrEP = pre-exposure prophylaxis.*

Individuals newly diagnosed in the Netherlands

Of the 27,552 individuals who were living in the Netherlands at the time of their HIV-1 diagnosis, or whose date of arrival in the country had not yet been recorded in the SHM database, 248 (1%) were diagnosed as children under 15 years of age: they are described in more detail in *Chapter 7*. Among the 27,426 individuals for whom the date or period of diagnosis was known, 27,181 (99%) were diagnosed at 15 years of age or older. Of these 27,181 individuals, 16,211 (60%) were men who have sex with men, 5,804 (21%) were other men, 4,898 (18%) were women, and 268 (1%) were trans men and women (*Table 1.1*).

Table 1.1: Annual number of HIV-1 diagnoses among who men who have sex with men (MSM), other men, women, trans men and women, and children below 15 years of age. Numbers in the second column for each group are adjusted to reflect a delay in notification to SHM and due to rounding may not add up to the total number reported in the last column.

Year of diagnosis	MSM		Other men		Women		Trans men and women		<15 years of age		Total	
≤1995	2,112		729		565		15		56		3,477	
1996	367		160		100		3		10		640	
1997	425		190		139		5		11		770	
1998	319		156		125		1		11		612	
1999	335		159		150		5		14		663	
2000	361		206		203		5		15		790	
2001	426		230		241		7		18		922	
2002	450		252		268		6		15		991	
2003	430		257		282		7		21		997	
2004	566		266		269		7		14		1,122	
2005	606		266		260		11		11		1,154	
2006	639		223		206		6		4		1,078	
2007	747		215		209		10		4		1,185	
2008	817		222		177		11		11		1,238	
2009	753		221		178		8		6		1,166	
2010	760		215		165		7		10		1,157	
2011	744		202		150		11		1		1,108	
2012	690		185		153		12		3		1,043	
2013	724		164		123		9		1		1,021	
2014	599		154		128		7		2		890	
2015	566		172		128		14		1		881	
2016	526	526	145	145	104	104	5	5	2	2	782	783
2017	504	505	146	146	94	94	10	10	1	1	755	756
2018	439	440	131	133	82	83	15	15	1	1	668	672
2019	348	351	144	147	106	108	18	18	1	1	617	626
2020	254	259	89	92	77	80	14	14	0	0	434	445
2021	237	245	97	102	69	73	11	12	1	1	415	432
2022	225	237	105	115	81	89	15	16	0	0	426	458
2023	242	273	103	125	66	81	13	16	0	0	424	494
Total	**16,211**	**16,272**	**5,804**	**5,849**	**4,898**	**4,930**	**268**	**274**	**245**	**245**	**27,426**	**27,571**

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

Number of new diagnoses

The annual registered number of new HIV diagnoses steadily fell from approximately 1,200 in 2008 to 434 in 2020 (*Table 1.1; Figure 1.2A*). Thereafter, the decrease appeared to be levelling off and, so far, 424 new HIV diagnoses have been registered for 2023. However, taking into account the backlog[a] in registration of HIV cases, the projected number of new HIV diagnoses in 2023 after adjustment may be as high as 494.

In MSM, the annual number of diagnoses rose to 817 in 2008 and gradually fell to 242 (adjusted 273) in 2023 (*Figure 1.2B*). Among other men and among women, the annual number of new diagnoses has decreased to 103 (adjusted 125) and 66 (adjusted 81), respectively, in 2023. Finally, the number of new diagnoses among trans men and women varied between approximately ten and fifteen in most recent calendar years.

SHM collects data on prior use of pre-exposure prophylaxis (PrEP) in all individuals newly diagnosed with HIV since 2018 (see for more details *Special Report 1.2*). Among MSM and trans individuals, who are the primary target groups of the national PrEP programme, the proportion of people reporting prior use of PrEP has steadily increased over calendar time (*Figure 1.2C*). In 2023, 37 (15%) of the 255 observed new diagnoses in MSM and trans individuals were in people who reported prior use of PrEP, while 129 (51%) people reported never to have used PrEP. For 89 (35%) individuals, information on prior use of PrEP was not available.

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. The estimated number of infections in people living in the Netherlands at the time they acquired HIV decreased from 905 (95% confidence interval [CI] 870-940) in 2010 to 270 (245-300) in 2020. Thereafter, the number of infections appeared to rise, albeit with considerable uncertainty, to 310 (225-385) in 2023 (*Figure 1.3A*). During the same period, the number of newly acquired HIV infections among MSM fell from 690 (660-725) in 2010 to 155 (135-170), and was 200 (145-260) in 2023 (*Figure 1.3B*).

In other men and in women, the estimated numbers of newly acquired infections in 2010 were 125 (95% CI 110-135) and 90 (80-100), respectively. By 2023 this had dropped in both groups, reaching 80 (35-125) in other men and 25 (5-55) in women (*Figure 1.3C* and *1.3D*).

a As it may take some time before people with HIV are registered in the SHM database by their treating physician, there is a backlog for the most recent calendar years. Based on past trends in registration, adjustment factors for 2016-2023 were estimated using the European Centre for Disease Prevention and Control (ECDC) HIV Platform Tool[1].

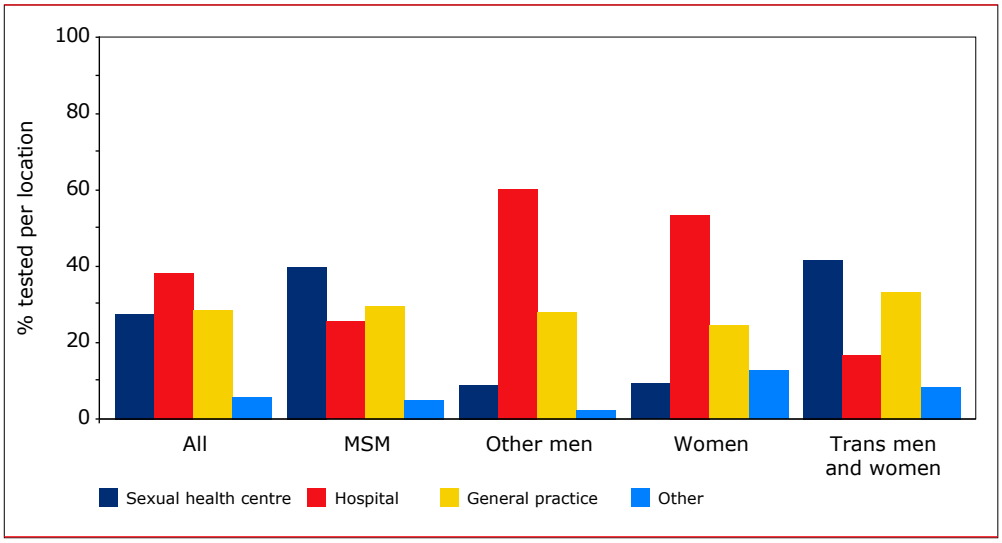
Figure 1.3: *Observed annual number of HIV diagnoses (red) and estimated annual number of newly acquired HIV infections (blue) in: the total population (A), in men who have sex with men (B), in other men (C), in women (D), according to the European Centre for Disease Prevention and Control (ECDC) HIV Platform Tool[1]. The red dashed lines represent the number of diagnoses after adjusting for the delay in notification to SHM, while the pink bands are the uncertainty bounds. The blue dashed lines indicate that estimates in 2020 and later are still uncertain, as these are quite sensitive to the observed number of diagnoses in those years. Estimates are based on adjusted numbers of diagnoses excluding migrants with a documented pre-arrival diagnosis and other migrants who were likely to have acquired their HIV infection before arrival in the Netherlands.*

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

Setting in which HIV is diagnosed

Information on the setting in which HIV was diagnosed in the Netherlands was available for 1,202 (95%) of the 1,264 people diagnosed in 2021-2023, while 44 (3%) individuals were known to have been diagnosed abroad. Overall, 331 (27%) of these 1,202 individuals received their first HIV-positive test result at a sexual health centre, 459 (38%) at a hospital, 342 (28%) at a general practice, and 70 (6%) at another location (*Figure 1.4*). Among the 331 individuals diagnosed at sexual health centres, 272 (82%) were MSM, 25 (8%) were other men, 19 (6%) were women, and 15 (5%) were trans men and women, which was similar to the proportions directly reported by sexual health centres for 2023[2]. Among the 459 individuals diagnosed in a hospital, 175 (38%) were MSM, 169 (37%) were other men, 109 (24%) were women, and 6 (1%) were trans men and women, while among the 342 people diagnosed at a general practice 201 (59%) were MSM, 79 (23%) were other men, 50 (15%) were women, and 12 (4%) were trans men and women.

Figure 1.4: *Proportion of individuals diagnosed in 2021–2023, stratified by location of testing and key population. Location of testing in the Netherlands is known for 1,202 (95%) of 1,264 individuals diagnosed, of whom 682 (57%) MSM, 280 (23%) other men, 204 (17%) women, and 36 (3%) trans men and women, while 44 (3%) individuals were diagnosed abroad.*



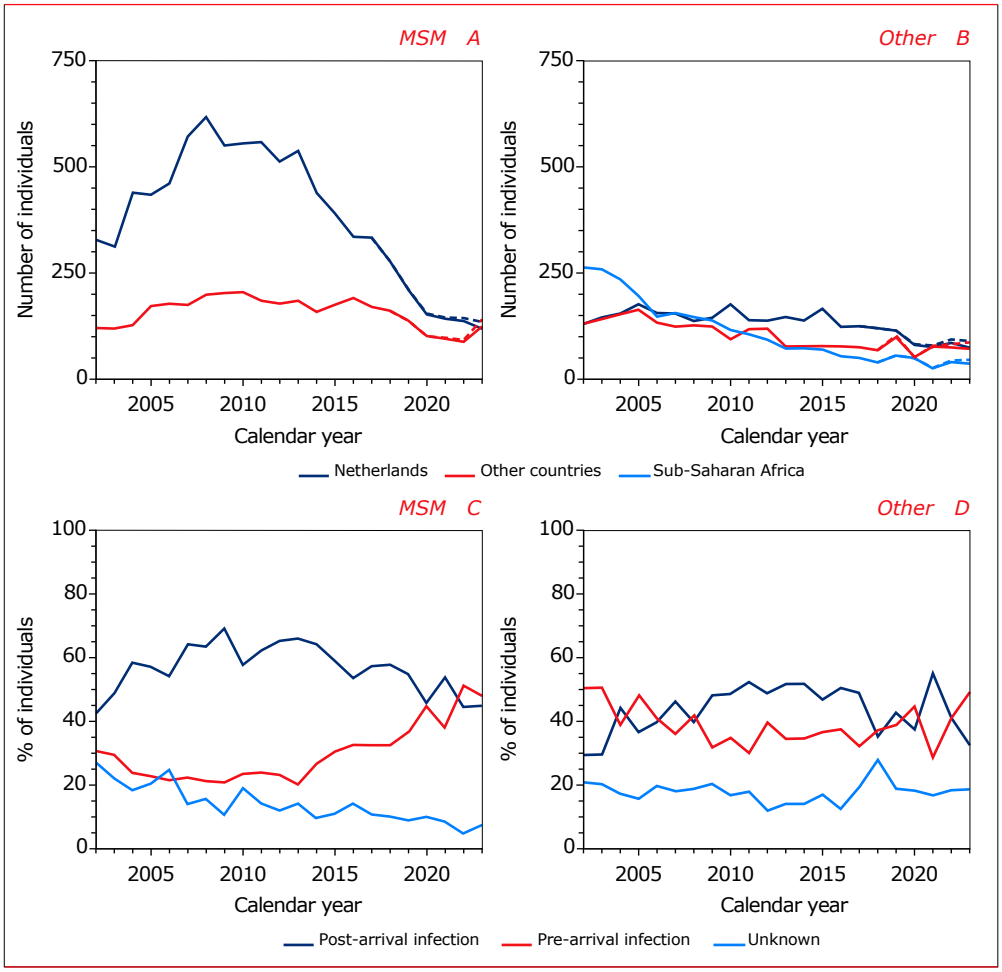
Legend: *MSM = men who have sex with men.*

Geographical region of origin

Of the 19,442 people diagnosed with HIV-1 in 2002-2023 at 15 years of age or older, 11,321 (58%) were born in the Netherlands and 8,121 (42%) outside the Netherlands. Of the 11,866 MSM, 71% originated from the Netherlands, 10% from other European countries, 6% from South America, 4% from the Caribbean, and 3% from south and southeast Asia (*Figure 1.5A*). In recent years (i.e. for diagnoses in 2021-2023), the proportion of MSM of Dutch origin was 57%, down from 72% before 2021, while the proportion of MSM from central Europe was 11%, up from 3% before 2021.

Among the 7,576 individuals other than MSM diagnosed in 2002-2023, 38% originated from the Netherlands, while 32% originated from sub-Saharan Africa, 9% from South America, 8% from other European countries, 5% from the Caribbean, and 4% from south and southeast Asia (*Figure 1.5B*). Between 2021 and 2023, 42% were of Dutch origin (38% before 2021), and 18% originated from sub-Saharan Africa (33% before 2021), while 8% were from central Europe (3% before 2021), and 6% from Eastern Europe (1% before 2021).

Figure 1.5: *Annual number of diagnoses by region of origin and, for individuals born outside the Netherlands, proportion of pre- and post-arrival infections among: (A, C) men who have sex with men (MSM), and (B, D) other people aged 15 years or older at the time of diagnosis. Of the 704 MSM diagnosed in 2021-2023, 398 (57%) originated from the Netherlands, 129 (18%) from other European countries, 60 (9%) from South America, 35 (5%) from the Caribbean, and 31 (4%) from south and southeast Asia. Of the other 560 people diagnosed in 2021-2023, 235 (42%) originated from the Netherlands, 89 (16%) from other European countries, 103 (18%) from sub-Saharan Africa, 48 (9%) from South America, 28 (5%) from the Caribbean, and 27 (5%) from south and southeast Asia.*



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

Overall, 15% of individuals newly diagnosed in 2021-2023 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. Of the people of Dutch origin diagnosed in these years, 9% and 14%, respectively, were living in each of the above PHS regions, while these proportions were 20% and 14%, respectively, for the people born outside the Netherlands. Among MSM, 17% were living in Amsterdam at the time of diagnosis and 14% were living in Rotterdam-Rijnmond, while among other individuals, 12% were living in Amsterdam and 15% in Rotterdam-Rijnmond. Other PHS regions with at least 5% of the new diagnoses in 2021-2023 were Haaglanden (9%, including Den Haag), Hart voor Brabant (7%, including Den Bosch and Tilburg), and Utrecht (5%).

HIV infections acquired before arrival in the Netherlands

Among the 1,264 individuals with an HIV diagnosis in the Netherlands in 2021-2023, 631 (50%) were born outside the Netherlands, of whom 306 MSM and 325 other men, women, or trans individuals. Overall, 269 (43%) most likely acquired their HIV infection before arrival in the Netherlands and 283 (45%) after arrival. The likelihood of pre- or post-migration infection was mainly based on whether an individual was diagnosed with a recent HIV infection, on the CD4 cell count at the time of diagnosis, on the time of arrival in the Netherlands, and on the rate of decline in CD4 cell counts after acquiring HIV[3,4]. For 79 (13%) individuals, there was not enough information to determine this likelihood.

In MSM born outside the Netherlands, the proportion with likely pre-migration infection appears to have increased since 2010 (*Figure 1.5C*). Of the 306 MSM born outside the Netherlands and diagnosed in 2021-2023, 140 (46%) most likely acquired their HIV infection before moving to the Netherlands, 145 (47%) most likely acquired their infection after arrival, while for 21 (7%) the likelihood of pre- or post-migration could not be determined. Among individuals other than MSM, there were no changes over calendar time and in 2021-2023, 129 (40%) most likely acquired HIV before arrival in the Netherlands, 138 (42%) after arrival, and for 58 (18%) the likelihood could not be determined (*Figure 1.5D*).

Age at time of HIV diagnosis

The age at which individuals are diagnosed with HIV has been slowly increasing over time. In 2002, the median age at the time of diagnosis was 36 years (interquartile range [IQR] 29-43); in 2023, it was 39 years (IQR 30-50). In 2002-2023, 19% of individuals who received an HIV diagnosis were aged 50 years or older; in 2023, 26% were 50 years or older (*Figure 1.6*)[5].

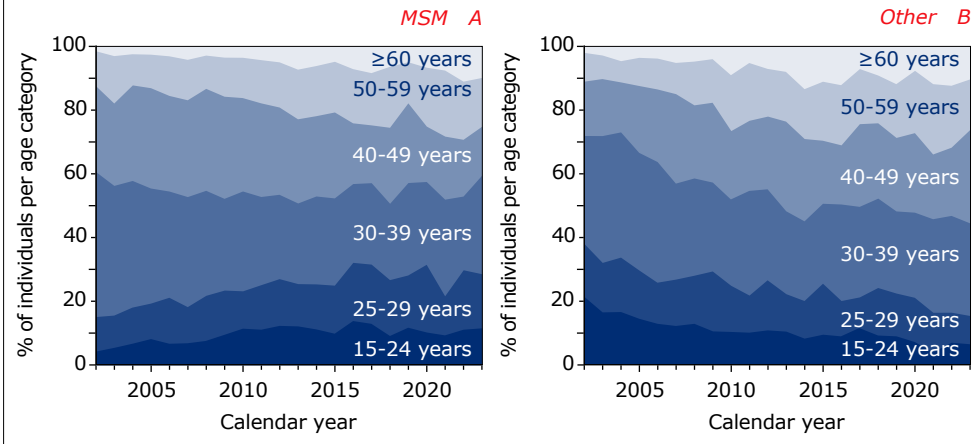
It is worth noting that although the median age at diagnosis in MSM (39 years) did not change between 2002 and 2023, both the proportion diagnosed below 30 years of age and the proportion diagnosed above 50 years of age increased during this period. In 2002, 15% of MSM were younger than 30 years at the time of their diagnosis while 12% were 50 years of age or older; these proportions were 29% and 25%, respectively, in 2023. The increases in the proportions do, however, not reflect increases in the annual number of HIV diagnoses but rather a steeper decrease in diagnoses in the group between 30 and 50 years of age. Between 2010 and 2023, the annual number of diagnoses among MSM 30 to 50 years of age decreased by 76%, from 461 to 112. During the same period, the number of diagnoses decreased from 176 to 69, or 61%, in MSM younger than 30 years, and from 123 to 61, or 50%, in MSM 50 years of age or older.

There were some age differences between MSM, other men, and women diagnosed in 2021-2023. MSM born in the Netherlands were diagnosed at a median age of 46 years (IQR 32-57), while MSM of foreign origin were diagnosed at a much younger median age of 33 years (28-40). Men other than MSM were 44 years (36-55) of age at the time diagnosis, which was somewhat older than the median age of 40 years (31-51) for women. In 2023, 25% of MSM, 28% of other men, and 27% of women were 50 years or older at the time of diagnosis.

HIV diagnoses in people under 25 years of age

Between 2002 and 2023, 2,062 (11%) individuals who received an HIV diagnosis at 15 years of age or older were under 25 years of age (*Figure 1.6*). In 2023, 40 people under 25 years of age (all aged 18 or older) were diagnosed with HIV, which amounted to 9% of all people diagnosed with HIV that year. The number of individuals under 25 years of age diagnosed in 2023 was 28 (12%) among MSM, 5 (5%) among other men, and 5 (8%) among women. Of the 40 young people, 18 (45%) were born in the Netherlands, while six originated from South America, five from central Europe, four from sub-Saharan Africa, and seven from elsewhere.

Figure 1.6: Age distribution at the time of diagnosis among: (A) men who have sex with men (MSM), and (B) other men and women with HIV-1. In 2002-2023, the proportion of individuals between 15 and 29 years of age changed from 15% to 29% for MSM, and from 38% to 15% for other individuals. During the same period, the proportion of MSM aged 50 years or older at the time of diagnosis changed from 12% to 25%, while these proportions were 11% and 26% for other individuals.



Legend: MSM = men who have sex with men.

Entry into care

Of the 1,202 individuals diagnosed with HIV in 2021-2023 for whom the diagnosis setting was known, 59% entered HIV care within a week of diagnosis, 83% within two weeks, 95% within four weeks, and 98% within six weeks. For individuals diagnosed in 2023, these proportions were 60%, 83%, 95%, and 99%, respectively. The proportion in care within four weeks was 95% 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 (94%), or at other locations (90%). The proportion in care within four weeks did neither differ between MSM, other men, and women, nor by age at the time of diagnosis. The proportion in care within four weeks of diagnosis was larger among individuals born in the Netherlands (97%) than among those born abroad (94%).

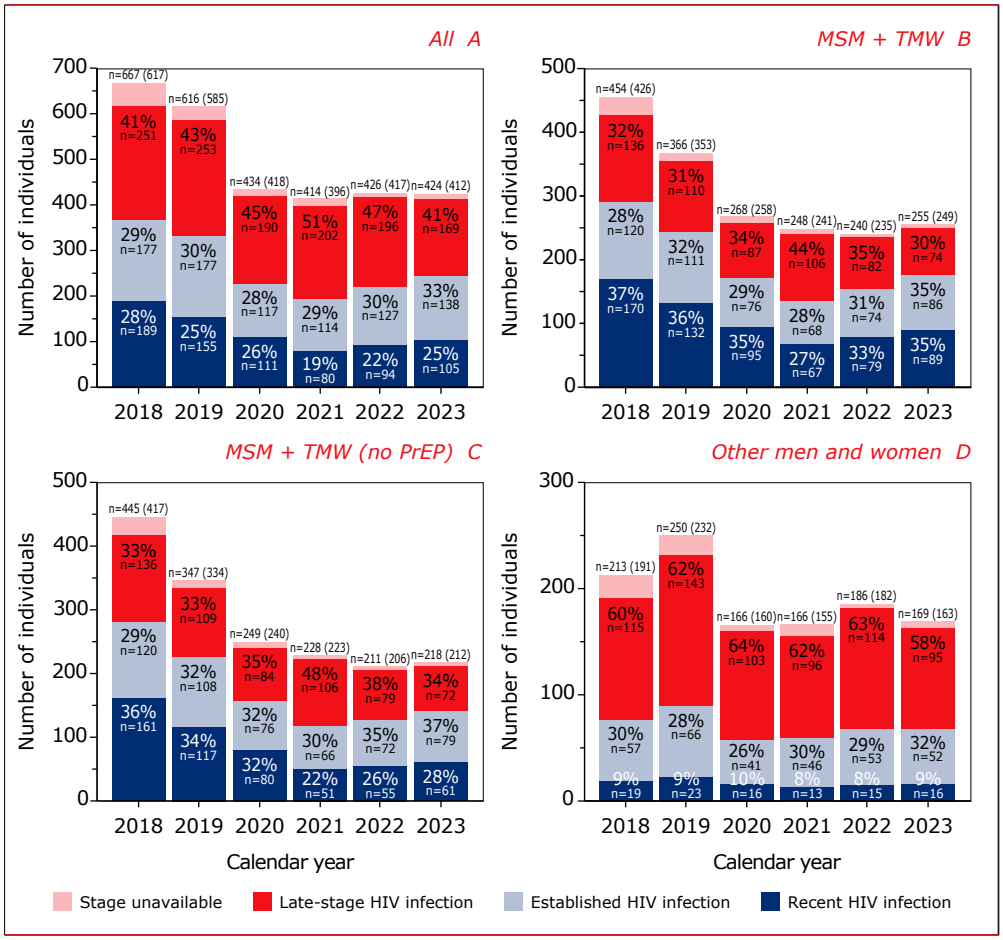
Stage at time of HIV diagnosis

Individuals newly diagnosed with HIV were classified into the following four mutually exclusive stages:

- recent HIV infection: evidence of having acquired HIV in the 12 months prior to diagnosis, based on having (i) a negative or indeterminate blot at the time of diagnosis, or (ii) a last negative test at most 12 months prior to diagnosis.
- established HIV infection: diagnosed with a CD4 count above 350 cells/mm^3, no AIDS-defining event at the time of diagnosis, and no evidence of having acquired HIV in the previous 12 months.
- late-stage HIV infection: diagnosed with a CD4 count below 350 cells/mm^3 or an AIDS-defining event regardless of CD4 count, and no evidence of having acquired HIV in the previous 12 months[6].
- stage unavailable: no evidence of having acquired HIV in the previous 12 months, no AIDS-defining event at the time of diagnosis, and no CD4 count available at the time of diagnosis.

The proportion of individuals diagnosed with recent HIV infection decreased from 28% in 2018 to 19% in 2021 and then increased to 25%, while the proportion with late-stage HIV was 41% in 2018, increased to 51% in 2021 and was 41% in 2023 (*Figure 1.7A*). Meanwhile, there were only minor changes in the proportion with established HIV infection. On closer inspection, these changes were to some extent the result of a decreasing number of MSM and trans men and women relative to the total annual number of newly diagnosed HIV infections, from 68% in 2018 to 60% in 2023. Besides, changes in the number and proportion of MSM and trans men and women diagnosed with recent, established, or late-stage HIV were also the result of the increasing share of people reporting prior use of PrEP among the annual number of new HIV diagnoses (*Figure 1.7B* and *1.7C*). In other men and women, changes in the proportion diagnosed in each of these three stages were less pronounced (*Figure 1.7D*).

Figure 1.7: *Annual number and proportion of individuals diagnosed with recent, established, or late-stage HIV infection in 2018-2023 (A) in the total population aged 15 years or older at the time of diagnosis, (B) in men who have sex with men (MSM) and trans men and women, (C) in MSM and trans men and women excluding those who reported prior use of pre-exposure prophylaxis, and (D) in other men and women. Recent HIV infection was (i) a negative or indeterminate blot at the time of diagnosis, or (ii) a last negative test at most 12 months or 6 months prior to diagnosis; established HIV infection: no recent HIV infection, CD4 counts above 350 cells/mm³, and not having AIDS at the time of diagnosis; late-stage HIV infection: no recent HIV infection, CD4 counts below 350 cells/mm³ or having AIDS, regardless of CD4 count. Numbers above the bars are the total number of diagnoses in each year, while numbers in brackets are the number of diagnoses excluding individuals whose stage at diagnosis is unavailable. Percentages inside the bars are relative to the number in brackets for late-stage and established infection, and relative to the total number of diagnoses for recent HIV infection.*

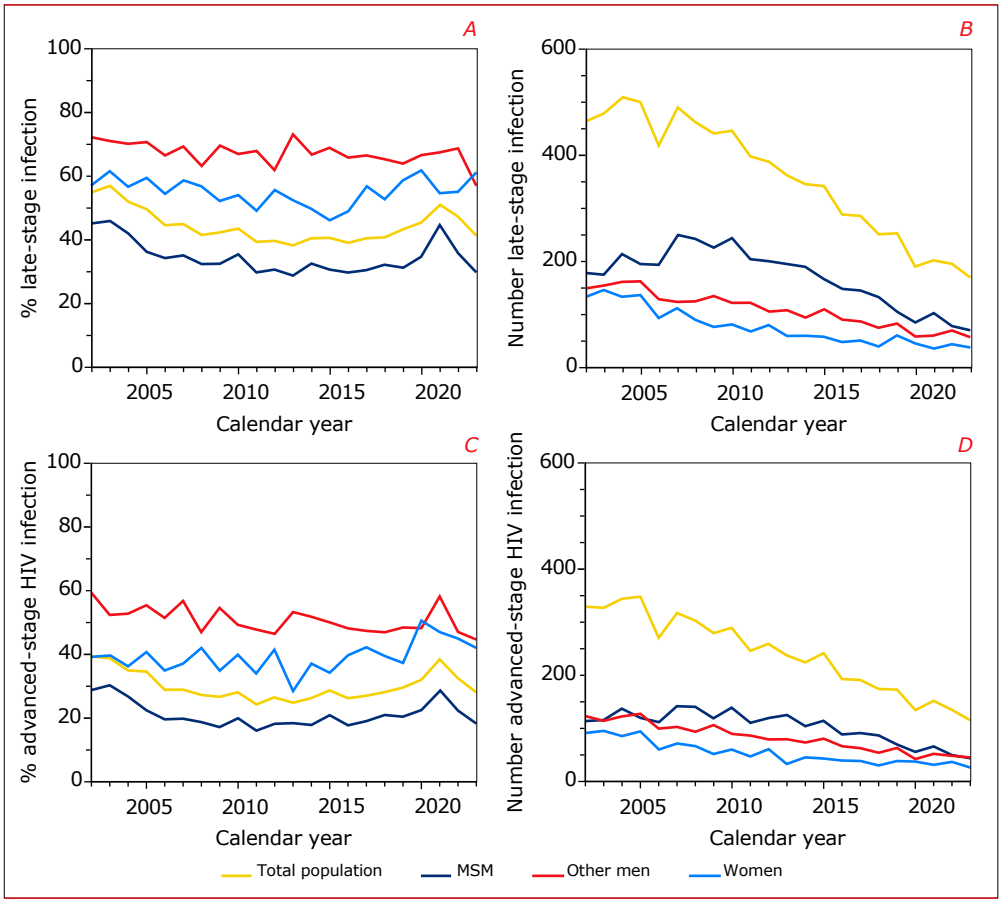


Legend: *MSM = men who have sex with men; TMW = trans men and women; PrEP = pre-exposure prophylaxis.*

Late diagnosis

Overall, 46% of the individuals diagnosed in 2021-2023 had a late-stage HIV infection at the time of diagnosis. Over time, the proportion of late-stage HIV diagnoses decreased from 55% in 2002 to a nadir of 38% in 2013, increased to 51% in 2021, and then again decreased to 47% in 2022, and 41% in 2023 (*Figure 1.8A*). This increase between 2013 and 2021 was mainly due to changes in the proportion of MSM diagnosed with late-stage HIV (see also *Figure 1.7B*). The proportion of individuals diagnosed with advanced HIV disease (i.e. with a CD4 count below 200 cells/mm^3 or AIDS-defining event, and no evidence of having acquired HIV in the previous 12 months), has followed a similar pattern, and reached 28% in 2023 (*Figure 1.8C*). Although the downward trend in these *proportions* appears to have halted after 2013, the *number* of individuals diagnosed with late-stage or advanced-stage HIV infection continued to decrease, albeit gradually (*Figure 1.8B* and *1.8D*). It is worth noting that although newly diagnosed MSM had the lowest proportion of late-stage HIV infections, they accounted for 251 (44%) of all 567 individuals diagnosed with late-stage HIV in 2021-2023.

Figure 1.8: *Proportion and number of individuals classified as having: (A, B) late-stage, or (C, D) advanced-stage HIV infection at the time of diagnosis. In 2023, 169 (41%) individuals were diagnosed with late-stage HIV infection: 70 (30%) men who have sex with men (MSM), 57 (56%) other men, 38 (61%) women, and 4 (33%) trans men and women. During the same year, 115 (28%) individuals were diagnosed with advanced-stage HIV infection: 43 (18%) MSM, 45 (45%) other men, 26 (42%) women, and 1 (8%) trans individual. 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. As a CD4 count measurement close to the time of diagnosis and before start of therapy was sometimes missing, the stage of the HIV infection could not be determined for all individuals. In 2021–2023, the stage of infection was unknown for 39 (3%) individuals.*



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

Late diagnosis by region of origin, age, and setting of diagnosis

Among individuals diagnosed with HIV in 2021-2023, 251 (37%) MSM, 187 (64%) other men, 118 (57%) women and 11 (29%) trans men and women had a late-stage HIV infection. Late-stage HIV infections, in relative terms, were most common among people originating from sub-Saharan Africa (62%, or 71 individuals), from south and southeast Asia (59%, 33 individuals), or from central Europe (50%, or 59 individuals) (*Table 1.2*).

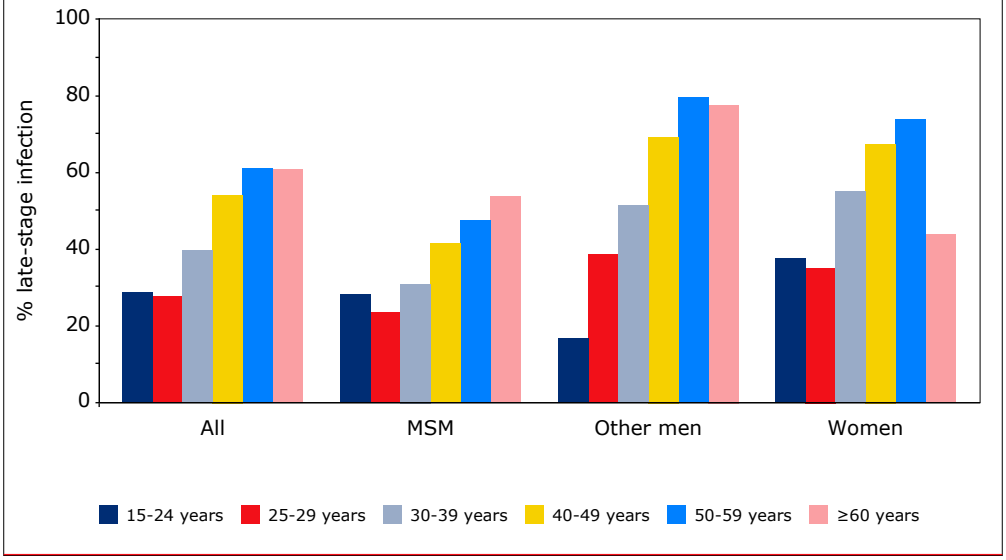
Older age at the time of diagnosis was also associated with a higher proportion of late-stage HIV infection. Of those diagnosed in 2021-2023, late-stage HIV was seen in 54% of MSM, 78% of other men, and 44% of women aged 60 years or older, compared with 25% of MSM, 34% of other men, and 36% of women diagnosed below the age of 30 years (*Table 1.2; Figure 1.9*).

Table 1.2: *Characteristics of the 567 individuals with a late-stage HIV infection among the 1,264 individuals diagnosed with HIV in 2021–2023. In total, as a result of missing CD4 cell counts at diagnosis, it was not possible to classify whether 39 (3%) individuals (17 MSM, 13 other men, 8 women, and 1 trans individual) had a late-stage HIV infection. For each of the five groups (MSM, other men, women, trans men and women, and total), percentages represent the proportion with late-stage infection of the total number of individuals diagnosed in each category listed in the first column.*

	MSM (n=687)		Other men (n=292)		Women (n=208)		Trans men and women (n=38)		Total (n=1,225)	
	n	%	n	%	n	%	n	%	n	%
Overall	251	37	187	64	118	57	11	29	567	46
Age at diagnosis (years)										
15–24	20	28	1	17	9	38	0	0	30	29
25–29	26	24	10	38	7	35	3	33	46	28
30–39	60	31	40	51	33	55	6	32	139	40
40–49	51	41	54	69	31	67	0	0	136	54
50–59	58	48	47	80	31	74	2	67	138	61
60–69	24	45	23	77	5	36	0	0	52	54
≥70	12	86	12	80	2	100	0	0	26	84
Region of origin										
Western	*156*	*37*	*101*	*66*	*35*	*45*	*2*	*33*	*294*	*44*
The Netherlands	146	37	99	67	32	44	2	33	279	45
Other western*	10	29	2	33	3	60	0	0	15	33
Non-Western	*95*	*36*	*86*	*62*	*83*	*64*	*9*	*28*	*273*	*48*
Sub-Saharan Africa	2	12	27	77	42	67	0	0	71	62
Central Europe	31	41	20	69	7	58	1	100	59	50
South America	19	33	9	64	7	44	4	24	39	38
Caribbean	15	44	5	38	2	25	2	33	24	39
South and southeast Asia	16	53	8	57	7	88	2	50	33	59
North Africa and the Middle-East	5	29	8	53	3	75	0	0	16	43
Other/unknown	7	22	9	50	15	79	0	0	31	43
Location of HIV diagnosis										
Sexual health centre	52	19	13	54	4	21	4	27	73	22
Hospital	118	69	126	77	83	77	3	50	330	73
General practice	62	31	38	49	20	42	2	18	122	36
Other/unknown	19	39	10	37	11	33	2	33	42	37
Last negative test†										
(1,2] years	26	35	4	27	3	27	1	17	34	32
(2–4] years	20	33	10	59	10	63	4	67	44	44
>4 years	69	65	25	69	28	65	0	0	122	65
Never tested / not available	136	60	148	76	77	63	6	60	367	66

Legend: *MSM = men who have sex with men; *includes western Europe, North America, Australia and New Zealand; †all individuals with a negative test within 1 year prior to diagnosis are classified as recent HIV infection.*

Figure 1.9: Proportion of individuals diagnosed with late-stage HIV infection stratified by age category at the time of diagnosis for those diagnosed in 2021-2023 or later.



Legend: MSM = men who have sex with men.

Late-stage HIV was also observed more frequently in people who received their HIV diagnosis at a hospital (73%) than among those who were tested at a general practice (36%), a sexual health centre (22%), or another testing location (37%). These proportions did not change over time except for individuals diagnosed at a hospital, in whom the proportion with late-stage HIV increased from 64% in 2010 to 77% in 2021 and was 68% in 2023. Late diagnosis was less common (38%) among people who had a most recent negative HIV test one to four years prior to their diagnosis than among individuals whose last negative test was more than four years previously (65%) or who did not report ever having tested for HIV before (66%).

Late diagnosis and hospitalisation

Hospitalisation around the time of HIV diagnosis was more frequently reported for individuals diagnosed with late-stage HIV infection than for those with recent or established HIV infection (*Table 1.3*). Among the 567 people diagnosed with late-stage HIV infection in 2021-2023, 243 (43%) were hospitalised within a year of diagnosis, including 203 (36%) as a direct result of their HIV infection. In contrast, only 64 (10%) of the 658 individuals diagnosed with recent or established HIV infection were hospitalised within a year of diagnosis, including

21 (3%) hospitalisations due to HIV. Within the group of people with late-stage HIV infection, hospitalisation was most frequently recorded among those who were diagnosed with AIDS (*Table 1.3*).

Late diagnosis and mortality

Of the 567 individuals diagnosed with late-stage HIV infection in 2021-2023, 20 (4%) died within a year of diagnosis, including 13 (2%) who died of AIDS (*Table 1.3*). Among the 658 people diagnosed with recent or established HIV infection, 4 (1%) died with a year of diagnosis, including no one who died of AIDS.

Table 1.3: *Number and proportion of individuals diagnosed in 2021–2023 who were hospitalised or who died within a year of diagnosis, stratified by stage of infection.*

		Hospitalisation				Death			
		Total		HIV-related		Total		AIDS-related	
Stage	**n**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**
Recent or established HIV infection	658	64	10	21	3	4	1	0	0
Late-stage HIV infection	567	243	43	203	36	20	4	13	2
CD4 200–349, no AIDS	165	20	12	10	6	0	0	0	0
CD4 <200, no AIDS	188	53	28	30	16	5	3	3	2
AIDS	214	170	79	163	76	15	7	10	5

Note: *AIDS = AIDS-defining event.*

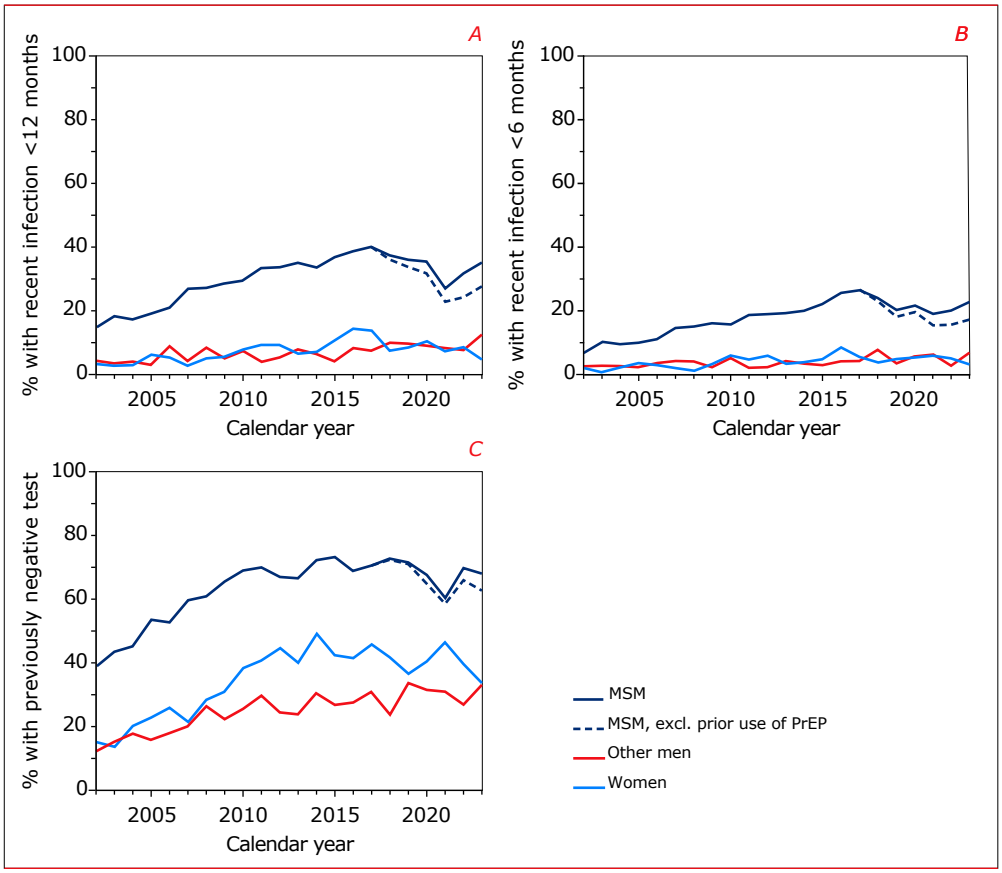
Late diagnosis and prior use of PrEP

Among MSM and trans men and women diagnosed in 2021-2023, 262 (36%) were diagnosed with a late-stage HIV infection (*Figure 1.7B*). When people who reported prior use of PrEP were excluded, the number diagnosed with late-stage HIV reduced to 257, but this represented a slightly higher proportion, 40%, of those diagnosed (*Figure 1.7C*).

Recent infection

Although many individuals are diagnosed with a late-stage HIV infection, a considerable proportion of people receive their HIV diagnosis early in the course of their infection. In total, among the individuals diagnosed in 2021-2023, 22% had evidence of having acquired their HIV infection in the 12 months prior to diagnosis, while 14% had evidence of having acquired HIV in the six months prior to diagnosis (Figure 1.10A and *1.10B*). For MSM, these proportions were 31% and 21%, respectively, while they were similar for trans men and women, 36% and 15%, respectively. Among other men and among women these proportions were considerably lower (8% and 5%, respectively).

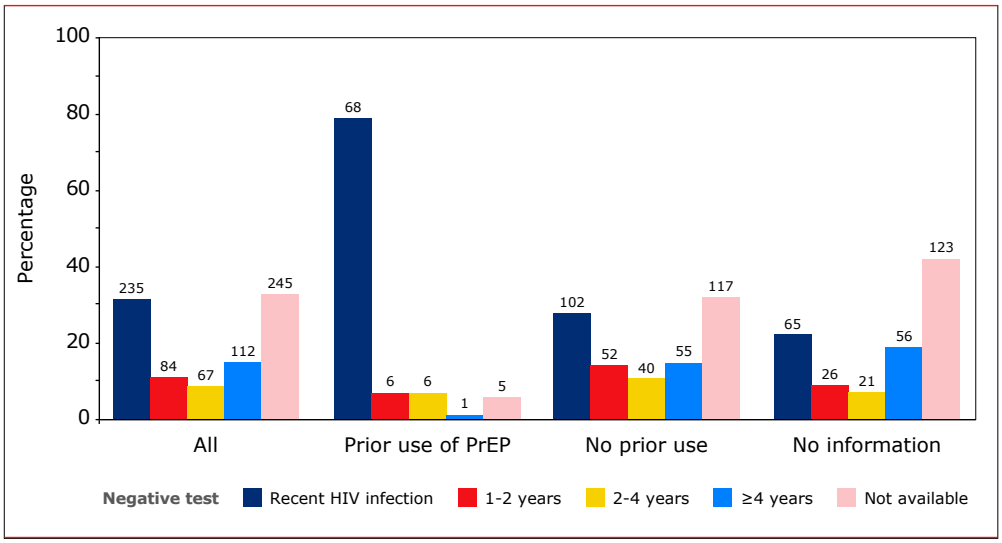
Figure 1.10: *Proportion of people diagnosed (A) with evidence of having acquired their HIV infection at most 12 months prior to their diagnosis, (B) at most 6 months prior to their diagnosis, (C) with a previously negative test at any time prior to their diagnosis. Evidence of a recent infection was (i) a negative or indeterminate blot at the time of diagnosis, or (ii) a last negative test at most 12 months or 6 months prior to diagnosis. In total, 85 (35%) men who have sex with men (MSM), or 57 (28%) MSM when excluding those who reported prior use of pre-exposure prophylaxis (PrEP), 13 (13%) other men, 3 (5%) women, 4 (31%) trans men and women, and 105 (25%) of all 424 individuals diagnosed in 2023 had evidence of having acquired HIV at most 12 months before diagnosis. In the same year, 55 (23%) MSM, or 35 (17%) MSM when excluding those who reported prior use of PrEP, 7 (7%) other men, 2 (3%) women, 2 (14%) trans men and women, and 65 (15%) of all 424 individuals had evidence of having acquired HIV at most six months before diagnosis.*



Legend: *MSM = men who have sex men; PrEP = pre-exposure prophylaxis.*

It is worth noting that the proportion of MSM with evidence of having acquired their HIV infection in the 12 months prior to diagnosis was 37% in 2018-2020, appeared to be lower, 27%, in 2021, and then increased to 32% in 2022 and 35% in 2023 (*Figure 1.10A*). This increase after 2021 appeared to be to a large extent due to the growing proportion of MSM reporting prior use of PrEP. When these MSM were excluded the proportions with a recent HIV infection were considerably lower, 22% in 2021, 24% in 2022, and 28% in 2023. A similar reduction in the proportion with recent HIV infection after excluding individuals reporting prior use of PrEP was seen in the combined population of MSM and trans men and women (*Figure 1.7B* and *1.7C*). The reason that the proportion with recent HIV infection decreased after excluding people reporting prior use of PrEP is that in this group of former PrEP users, the proportion diagnosed with recent HIV infection was much higher, 79%, than in people who never used PrEP or for whom no information on PrEP use was available (*Figure 1.11*).

Figure 1.11: *Proportion of men who have sex with men (MSM) and trans men and women diagnosed in 2021–2023 whose most recent negative HIV test was less than 1 year (i.e. recent HIV infection, including those with negative or indeterminate blot at the time of diagnosis), 1 to 2 years, 2 to 4 years, or more than 4 years prior to their HIV diagnosis, or who reported never having tested for HIV, overall and stratified by whether or not they reported prior use of PrEP. Numbers above the bars are the number of individuals diagnosed in each category and represented by each bar.*

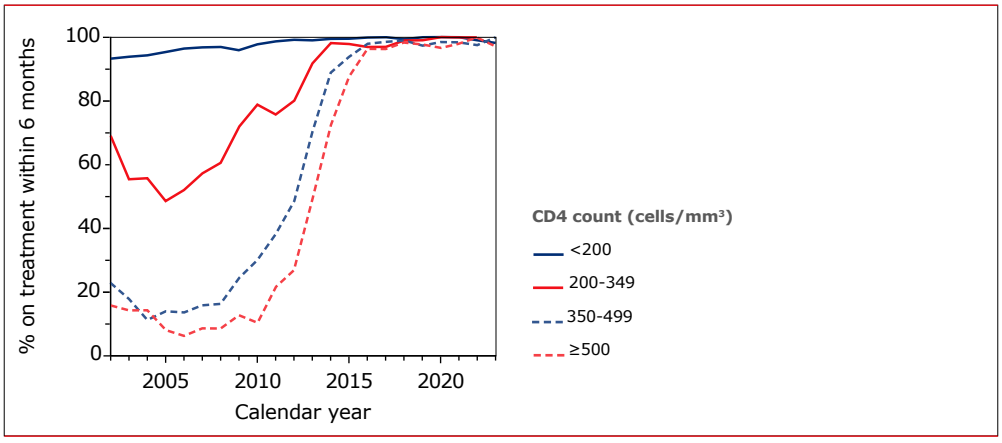


The proportion of people with a recorded previously negative HIV test any time before their HIV diagnosis increased from 25% in 2002 to 54% in 2023. MSM were more likely to have a previously negative HIV test than other men and women. In 2023, 68% of MSM newly diagnosed with HIV had a previously negative test, while this proportion was 33% both in other men and in women (*Figure 1.10C*). Overall, of MSM diagnosed in 2021-2023, 66% reported a previously negative test, meaning that a third (34%) never had an HIV test before their HIV diagnosis (see also *Figure 1.11*). The proportion with a known previously negative test was highest among those diagnosed at a sexual health centre (81%), compared with 37% of those diagnosed in a hospital, and 51% of those diagnosed at a general practice.

Antiretroviral therapy

Of the 27,181 individuals diagnosed at 15 years of age or older, 26,332 (97%) had started antiretroviral therapy (ART) by the end of 2023. Over the past two decades, ART has increasingly been initiated earlier in the course of an HIV infection (*Figure 1.12*). This is a consequence of people being diagnosed sooner, on average, after acquiring their HIV infection, and treatment guidelines recommending immediate initiation of ART, regardless of CD4 count[7]. Prior to 2015, individuals with higher CD4 counts were less likely to start therapy shortly after an HIV diagnosis, but after the treatment guidelines changed that year, there is now almost no delay between diagnosis and start of therapy. In 2021-2023, 98% of people who were diagnosed with HIV that year started ART within six months.

***Figure 1.12:** Proportion of individuals who started antiretroviral therapy (ART) within six months of their HIV diagnosis by CD4 count at the time of diagnosis. Of all individuals diagnosed in 2021-2023, 98% had started ART within six months of diagnosis.*



Time between HIV infection and viral suppression

Individuals with a suppressed viral load below 1,000 copies/ml cannot transmit HIV to other people (undetectable equals untransmittable, or U=U)[8–11]. Hence it is crucial to minimise the time between the moment a person acquires HIV and the point at which they achieve this threshold[12], not only for people with HIV, but also from a public health perspective. However people with HIV must first be diagnosed, then linked to care, and subsequently start therapy in order to be able to reach viral suppression.

Over time there have been significant improvements in several of these steps in the HIV care continuum. Between 2010 and 2023, the median time from diagnosis to reaching a viral load level below 200 copies/ml decreased from 0.84 years (IQR 0.37-2.59) to 0.18 years (IQR 0.13-0.29), or from 10.0 months (IQR 4.5-31.1) to 2.1 months (IQR 1.5-3.5). The median time to reaching a viral load level below 1,000 copies/ml was somewhat shorter, being 0.54 years (IQR 0.24-2.07) years, or 6.5 months (IQR 2.9-24.8), in 2010, and 0.15 years (IQR 0.11-0.23), or 1.8 months (IQR 1.3-2.7) in 2023. This decrease in time to viral suppression was achieved mainly as a result of starting therapy sooner after entry into care, and individuals with HIV reaching viral suppression faster once therapy had begun. The time from infection to diagnosis was the greatest contributing factor to the delay between acquiring HIV and achieving viral suppression. In 2023, this was estimated to be a median of 2.7 years (IQR 1.3-5.1).

Conclusions

Since 2008 there has been a steady decrease in the annual number of new HIV diagnoses. This decrease in HIV diagnoses can, in part, be attributed to a fall in the estimated annual number of newly acquired HIV infections. Nonetheless, it is worrisome that the downward trend in new HIV diagnoses appears to have levelled off since 2020. Almost half of the people with a new HIV diagnosis have a late-stage HIV infection (37% MSM; 64% other men; 57% women) resulting in hospitalisation in 43% and a mortality of 4% within one year of diagnosis.

In 2023, 15% of the new HIV diagnoses among MSM and trans men and women were in people who reported prior use of PrEP. This proportion of people with previous PrEP use is rising. People with prior use of PrEP accounted for a large share of the rebound in the proportion of individuals diagnosed with a recent HIV infection compared with 2021.

Apart from the 424 new HIV diagnoses in 2023, there were 314 people born abroad who arrived in the Netherlands in 2023 and had a documented HIV-1 diagnosis prior to arrival. The large majority of this group had already started antiretroviral therapy before arriving in the Netherlands and had a suppressed viral load.

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