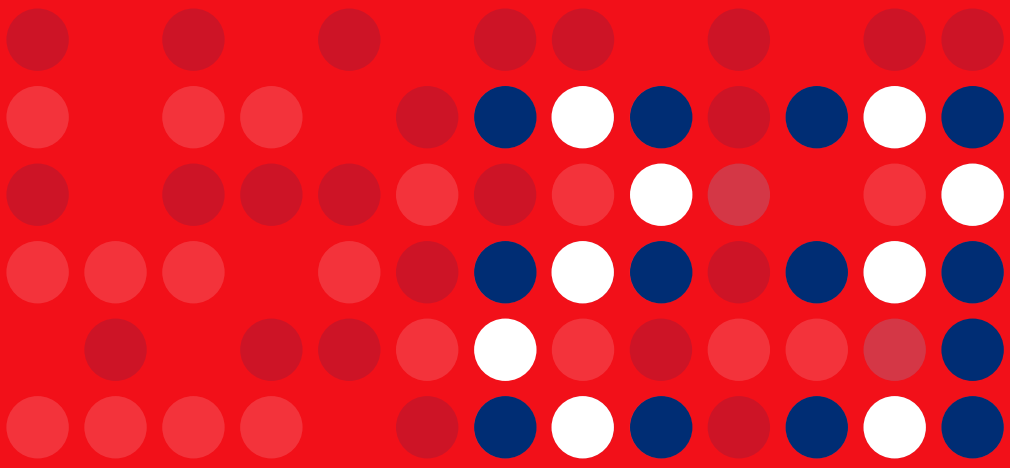
Human Immunodeficiency Virus (HIV)
Infection in the Netherlands

HIV Monitoring

HIV Monitoring Report 2023

Chapter 1: HIV in the Netherlands



1. HIV in the Netherlands

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Key findings

2022 at a glance

By the end of 2022, there were 24,400 people with HIV in the Netherlands, including an estimated 1,390 with an undiagnosed HIV infection. Altogether, 86% of this total, and 92% of those diagnosed and ever linked to care, had a suppressed viral load.

Of the 393 people with a new HIV diagnosis, 213 (54%) were MSM, 96 (24%) were other men, 70 (18%) were women, and 14 (4%) were trans men and women.

Adjusted for delay in reporting people with HIV to SHM, there were 461 new HIV diagnoses: 250 MSM, 112 other men, 83 women, and 16 trans men and women.

In total, 31% of all people newly diagnosed with HIV were aged 50 years or older at the time of diagnosis.

Of the 21,987 people with HIV-1 in care by the end of 2022, 56% were 50 years or older and 26% were 60 years or older. In total, 68% of people who are still in care have lived with HIV for more than 10 years.

Trends

2010–2022

The adjusted number of newly diagnosed HIV infections fell by 61% from 1,174 to 461, while among men who have sex with men (MSM) this dropped by 67%, from 768 to 250.

The estimated annual number of newly acquired HIV infections decreased by 85%, from 930 to 140. For MSM this fell by 88%, from 700 to 80.

2002–2022
The proportion of MSM under the age of 30 at the time of diagnosis increased from 15% to 31%. For those aged 50 or older in this group, this figure rose from 12% to 30%.

2020–2022
Of all people newly diagnosed in 2020-2022, 23% were diagnosed within 12 months of HIV infection; in MSM, this proportion was 32%.

In focus: PrEP
In 2022, 13% of MSM and trans men and women with a new HIV diagnosis reported prior use of PrEP, while 47% had not used PrEP. Information on prior use of PrEP was not available for the remaining 41%.

In focus: late-stage HIV 2020–2022
In 2020-2022, 575 (48%) individuals have been diagnosed with late-stage HIV infection. This figure comprises 261 MSM, 186 other men, 120 women, and 8 trans men and women, which is 38%, 69%, 57%, and 22%, respectively, of the total number diagnosed in each group.

In the under-30 years of age category, 30% of MSM, 38% of other men, and 38% of women were diagnosed with late-stage HIV infection. The proportion of individuals with late-stage HIV increased with age: it was found in 55% of MSM, 85% of other men and 67% of women diagnosed at 60 years of age or older.

Introduction

By May 2023, stichting hiv monitoring (SHM) had registered 33,940 individuals with HIV. The vast majority of these (33,022, or 97.3%) agreed to the collection of further clinical data once registered, whereas 918 (2.7%) declined to take part. Among those whose clinical data is collected, most (31,844) are registered with one of the HIV treatment centres in the Netherlands (*Figure 1.1*) while 1,418 are registered with the Curaçao Medical Center in Willemstad, Curaçao (see *Chapter 9*). A comparatively small group of 240 individuals are registered in both countries.

Of those registered in the Netherlands, the vast majority were diagnosed with HIV-1 (30,598, or 96%). Only 101 people were diagnosed with HIV-2, while 62 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 1,083.

The first part of this chapter focuses on the characteristics of people with HIV-1 at the time of diagnosis, and individuals with HIV-1 still in care at the end of 2022. This is followed by a brief overview of trans people with HIV-1. The chapter concludes with an outline of the population with an HIV-2 infection.

***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 is identified in an individual. 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.

***Box 1.2:** MSM, other men, women, and trans men and women*

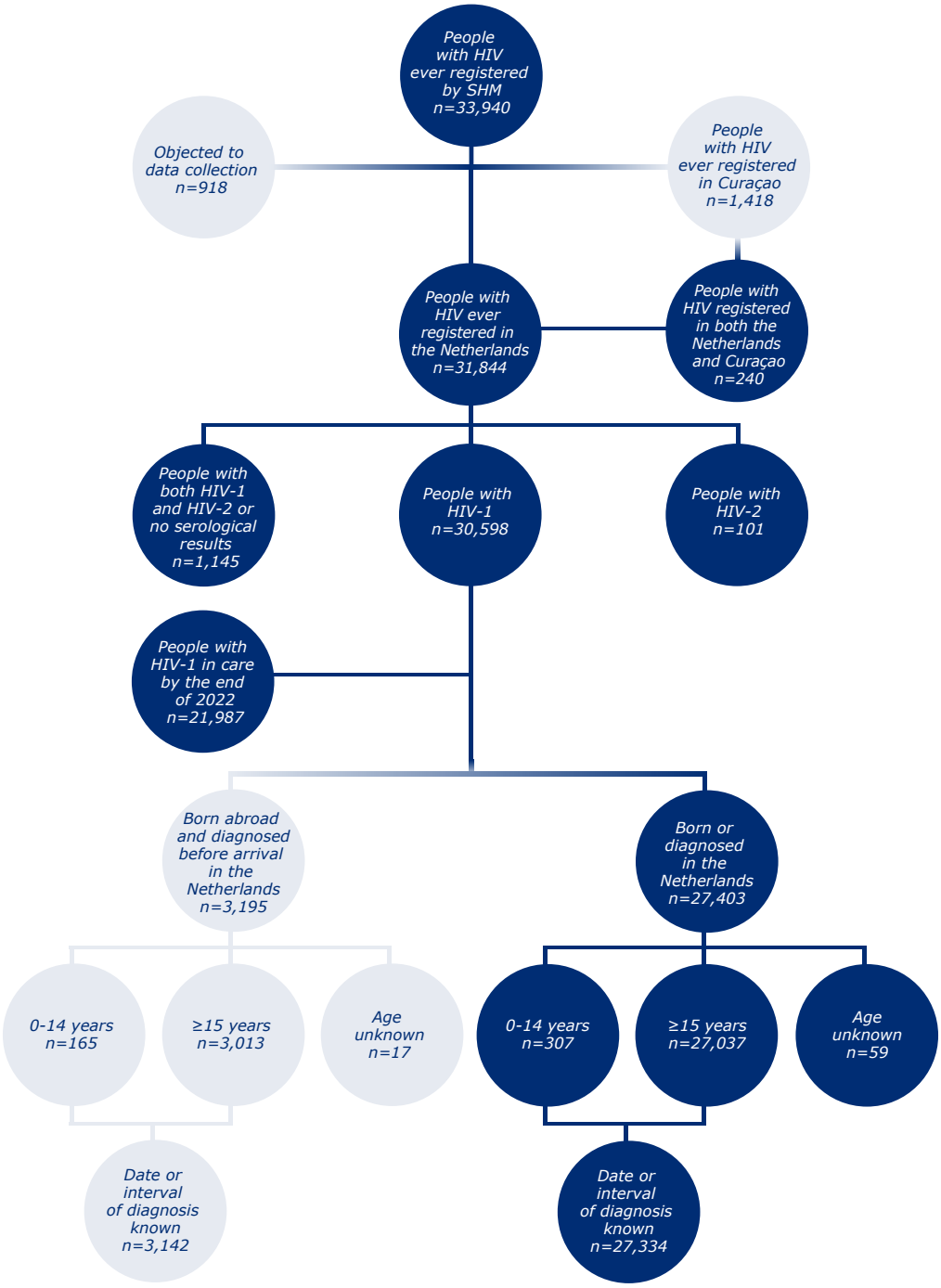
In this year's Monitoring Report, we adopt a classification of MSM, other men, women, and trans men and women that is slightly different from the definitions used in previous reports. Trans men and trans women are now considered as a separate population that includes everyone who identifies with a gender different from the one assigned at birth. Among cis individuals, MSM, or men who have sex with men, include all men who reported sex with men as the most likely route of transmission or who reported having male sex partners around the presumed time of HIV acquisition. All other cis men and all cis women are classified as 'other men' and 'women', respectively.

HIV-1

Individuals with HIV-1

Of the 30,598 individuals in the Netherlands who were ever diagnosed with HIV-1, 3,195 (10%) were born abroad and had a documented HIV diagnosis prior to arrival in the Netherlands (*Figure 1.1*). These 3,195 individuals have been excluded from the analyses on newly diagnosed individuals later in this section. The remaining 27,403 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 3,195 individuals who were born abroad and had a documented HIV-1 diagnosis before arriving in the Netherlands, 1,028 (32%) arrived in the Netherlands in 2020 or later (*Figure 1.2A*). So far, SHM has registered 454 migrants who arrived in 2022, which is an increase of 52% compared with the average annual number of migrants in 2018-2021. 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.

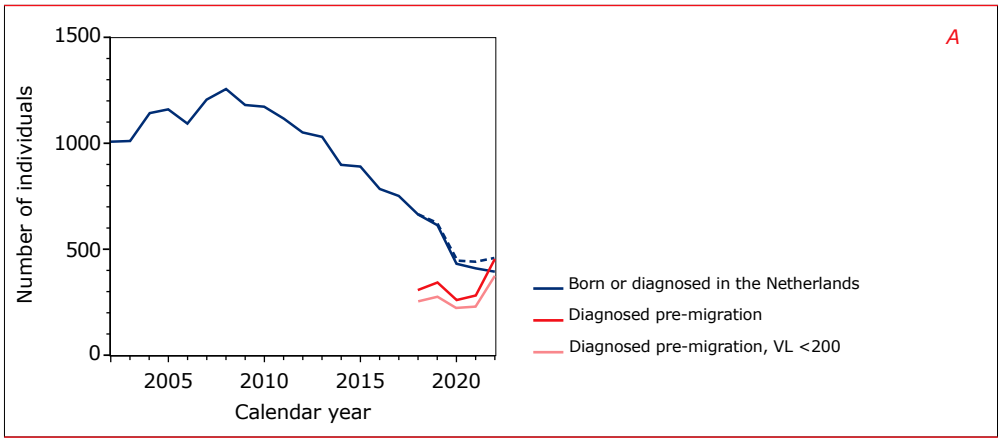
Of the 1,028 migrants who arrived in 2020 or later with a documented pre-arrival HIV diagnosis, 561 (55%) were men who have sex with men (MSM), 207 (20%) were other men, 231 (22%) were women, and 29 (3%) were trans people. The median age at the time of arrival was 36 years (interquartile range [IQR] 30-42); 85 (8%) were below 25 years of age, including nine children under the age of 15, while 98 (10%) were 50 years of age or older. In terms of geographic origins, migrants arrived from:

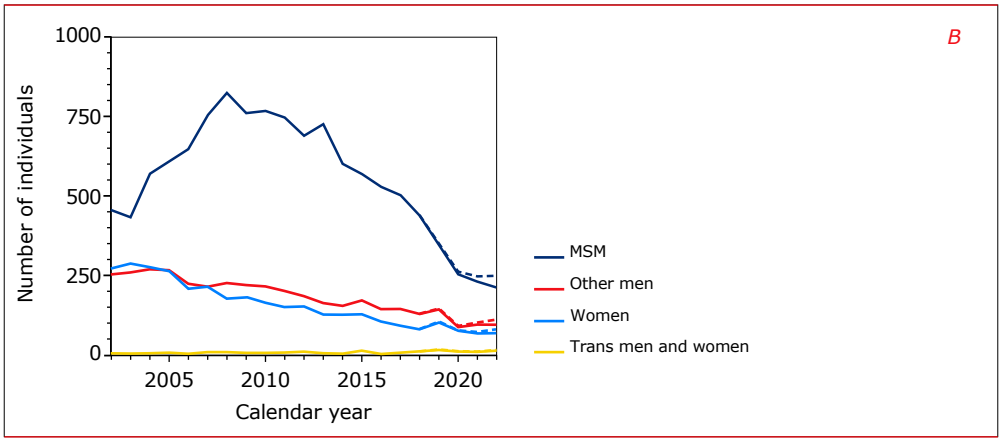
- eastern Europe (309, 30%)
- South America (195, 19%);
- sub-Saharan Africa (127, 12%);
- central Europe (88, 9%);
- western Europe (84, 8%);
- Caribbean (78, 8%);
- North Africa and Middle East (46, 4%);
- South and southeast Asia (43, 4%); and
- other regions (58, 6%).

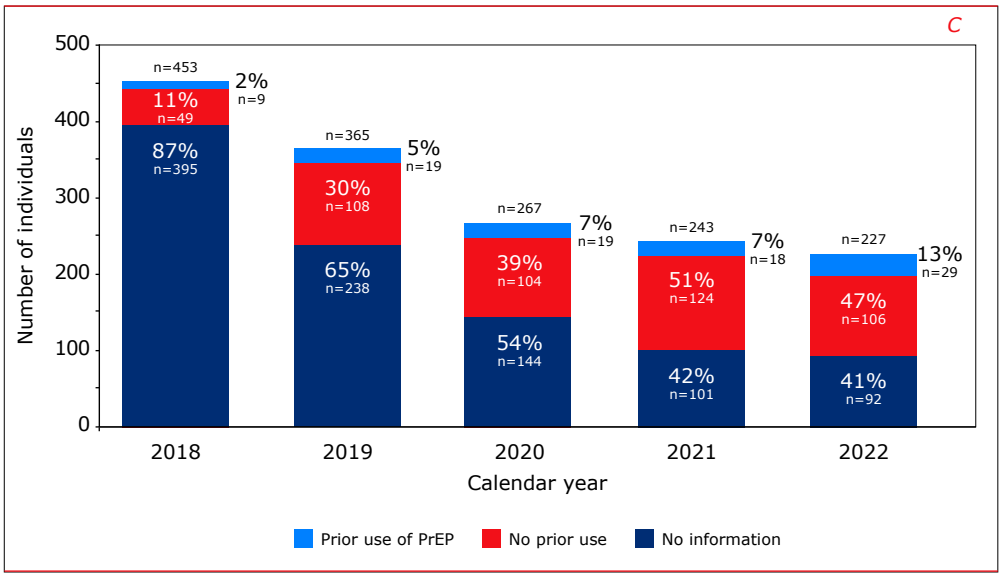
The most commonly reported countries of origin (from where at least 25 individuals with HIV arrived in the Netherlands) were Ukraine (204, 20%), Brazil (64, 6%), Russian Federation (63, 6%), Poland (48, 5%), Curaçao (42, 4%), and Colombia (40, 4%). Individuals from Ukraine and the Russian Federation accounted for 187 (41%) and 33 (7%), respectively, of the 454 migrants arriving in 2022.

The majority (958, or 94%) of the 1,028 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 640 (IQR 440-850) cells/mm^3, while 871 individuals had HIV RNA levels below 1,000 copies/ml (87% of the 1,004 who had an available viral load measurement), including 852 individuals with RNA levels below 200 copies/ml (85% of those 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 2022, MSM accounted for 54% of the annual number of new diagnoses, other men for 24%, women for 18%, and trans men and women for 4%. 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 27,403 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, 307 (1%) were diagnosed as children under 15 years of age: they are described in more detail in *Chapter 5*. Among the 27,334 individuals for whom the date or period of diagnosis was known, 27,035 (99%) were diagnosed at 15 years of age or older. Of these 27,035 individuals, 16,113 (60%) were men who have sex with men, 5,766 (21%) were other men, 4,920 (18%) were women, and 236 (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 with an asterisk 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	2,137	748	577	14	55	3,531
1996	373	160	99	2	10	644
1997	430	195	143	3	11	782
1998	321	161	130	1	11	624
1999	338	159	154	6	15	672
2000	364	209	209	4	16	802
2001	432	231	247	7	18	935
2002	457	255	274	6	15	1,007
2003	433	261	288	6	21	1,009
2004	570	270	278	7	14	1,139
2005	609	268	264	9	12	1,162
2006	648	225	210	5	7	1,095
2007	752	215	216	11	10	1,204
2008	825	227	179	10	16	1,257
2009	761	221	182	8	10	1,182
2010	768	217	166	8	15	1,174
2011	747	202	152	9	9	1,119
2012	690	186	154	12	10	1,052
2013	727	164	128	7	6	1,032
2014	602	155	128	6	8	899
2015	569	173	130	15	4	891
2016	529	145	106	4	2	786
2017	503	146	94	9	1	753
2018	440	130	82	13	1	666
*2018**	*440*	*130*	*82*	*13*	*1*	*667*
2019	348	144	104	17	1	614
*2019**	*354*	*147*	*106*	*17*	*1*	*625*
2020	255	88	77	12	0	432
*2020**	*264*	*91*	*80*	*12*	*0*	*447*
2021	232	97	69	11	1	410
*2021**	*248*	*104*	*74*	*12*	*1*	*439*
2022	213	96	70	14	0	393
*2022**	*250*	*112*	*83*	*16*	*0*	*461*
2023	40	18	10	0	0	68
Total	**16,113**	**5,766**	**4,920**	**236**	**299**	**27,334**

**Numbers adjusted for a delay in notification*

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

Decreasing number of diagnoses

The annual registered number of new HIV diagnoses has fallen steadily since 2008 (*Table 1.1; Figure 1.2A*). That downward trend continued in 2022 with 393 registered new HIV diagnoses. However, after taking into account a projected backlog[a] in registration of HIV cases, the decreasing trend appears to be levelling off, with an adjusted number of 461 new HIV diagnoses in 2022.

In MSM, the annual number of diagnoses rose to 825 in 2008 and gradually fell to 213 (adjusted 250) in 2022 (*Figure 1.2B*). Among other men and among women, the annual number of new diagnoses has decreased to 96 (adjusted 112) and 70 (adjusted 83), respectively, in 2022. 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 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 pre-exposure prophylaxis (PrEP) programme, the proportion of people reporting prior use of PrEP, has steadily increased over calendar time (*Figure 1.2C*). In 2022, 29 (13%) of the 227 observed new diagnoses in MSM and trans individuals were in people who reported prior use of PrEP, while 106 (47%) people reported never to have used PrEP. For 92 (41%) individuals, information on prior use of PrEP was not available.

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. The estimated number of infections decreased from 930 (95% confidence interval [CI] 890-960) in 2010 to 140 (80-240) in 2022 (*Figure 1.3A*), which is a reduction of 85% (73-91). During the same period, the number of newly acquired HIV infections among MSM fell by 88% (78-95), from 700 (670-720) in 2010 to 80 (40-150) in 2022 (*Figure 1.3B*).

In other men, the estimated number of newly acquired infections in 2010 was 120 (95% CI 110-140), which was similar to the estimated number of 100 (90-110) in women. By 2022 this had dropped sharply in both groups, reaching 30 (10-90) in other men and 30 (10-70) in women; respective reductions of 75% (21-91) and 74% (29-91) (*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 2018-2022 were estimated using the European Centre for Disease Prevention and Control (ECDC) HIV Platform Tool[10].

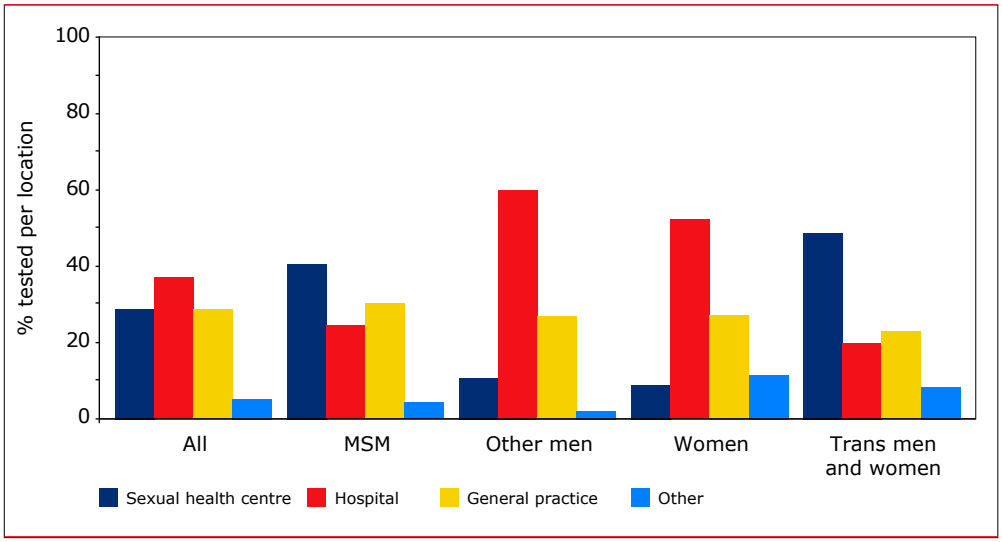
Figure 1.3: *Observed annual number of HIV diagnoses (red) and estimated annual number of newly acquired HIV infections (blue) in: the total population (A), in men who have sex with men (B), in other men (C), in women (D), according to the European Centre for Disease Prevention and Control (ECDC) HIV Platform Tool[10]. 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.*

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 1,177 (95%) of the 1,234 people diagnosed in 2020-2022, while 38 (3%) individuals were known to have been diagnosed abroad. Overall, 338 (29%) of these 1,177 individuals received their first HIV-positive test result at a sexual health centre, 436 (37%) at a hospital, 340 (29%) at a general practice, and 63 (5%) at another location (*Figure 1.4*). Among those diagnosed at sexual health centres in 2022, 80% were MSM, 7% were other men, 8% were women, and 5% were trans men and women, which was similar to the proportions directly reported by sexual health centres[1].

Figure 1.4: *Proportion of individuals diagnosed in 2020-2022, stratified by location of testing and key population. Location of testing is known for 1,177 (95%) of 1,234 individuals diagnosed, of whom 677 (57%) MSM, 260 (22%) other men, 205 (17%) women, and 35 (3%) trans men and women.*



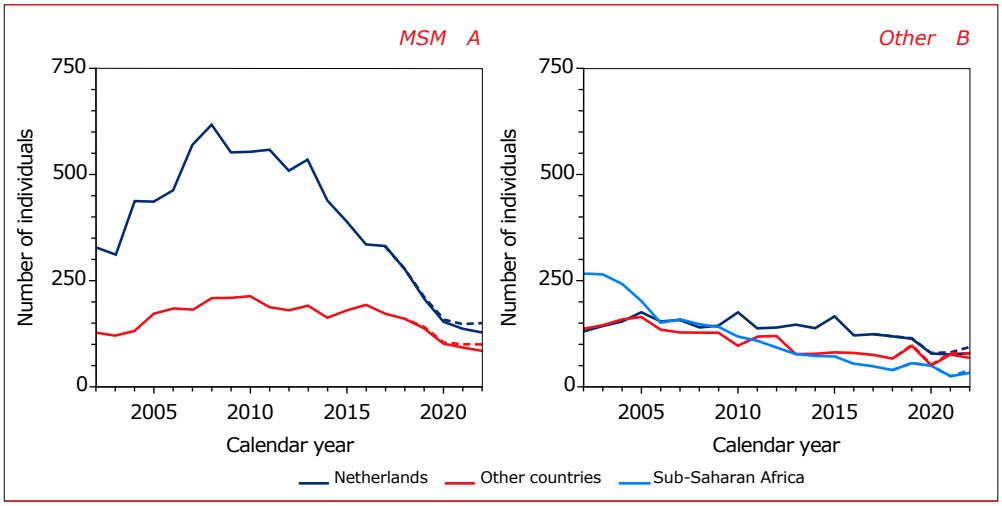
Legend: *MSM = men who have sex with men.*

Geographical region of origin

In total, 11,202 (41%) people diagnosed with HIV-1 at 15 years of age or older were born outside the Netherlands. Of the 16,113 MSM, 72% 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 2020-2022), the proportion of MSM of Dutch origin was 60%, down from 72% before 2020, while the proportion of MSM from central Europe was 10%, up from 3% before 2020.

Among the 10,922 individuals other than MSM, 39% originated from the Netherlands, while 31% originated from sub-Saharan Africa, 9% from South America, 5% from the Caribbean, and 4% from south and southeast Asia (*Figure 1.5B*). Between 2020 and 2022, 44% were of Dutch origin (39% before 2020), and 20% originated from sub-Saharan Africa (32% before 2020), while 8% were from central Europe, up from 3% before 2020.

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 15 years or older at the time of diagnosis. Of the 700 MSM diagnosed in 2020-2022, 420 (60%) originated from the Netherlands, 124 (18%) from other European countries, 60 (9%) from South America, 30 (4%) from south and southeast Asia, and 26 (4%) from the Caribbean. Of the other 534 people diagnosed in 2020-2022, 233 (44%) originated from the Netherlands, 73 (14%) from other European countries, 107 (20%) from sub-Saharan Africa, 45 (8%) from South America, 28 (5%) from the Caribbean, and 19 (4%) from south and southeast Asia.*



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

Overall, 17% of individuals newly diagnosed in 2020-2022 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, 13% and 12%, respectively, were living in each of the above PHS regions, while these proportions were 23% and 16%, respectively, of the people of foreign origin. Among MSM, 19% were living in Amsterdam at the time of diagnosis and 13% were living in Rotterdam-Rijnmond, while among other individuals, 15% were living in Amsterdam and 15% in Rotterdam-Rijnmond.

Other PHS regions with at least 5% of the new diagnoses since 2020 were Haaglanden (8%, including Den Haag), Hart voor Brabant (6%, including Den Bosch and Tilburg), and Utrecht (5%).

Increasingly older 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 2022, it was 40 years (IQR 30-52). In 2002-2022, 19% of individuals who received an HIV diagnosis were aged 50 years or older; in 2022, 31% were 50 years or older (*Figure 1.6*)[2].

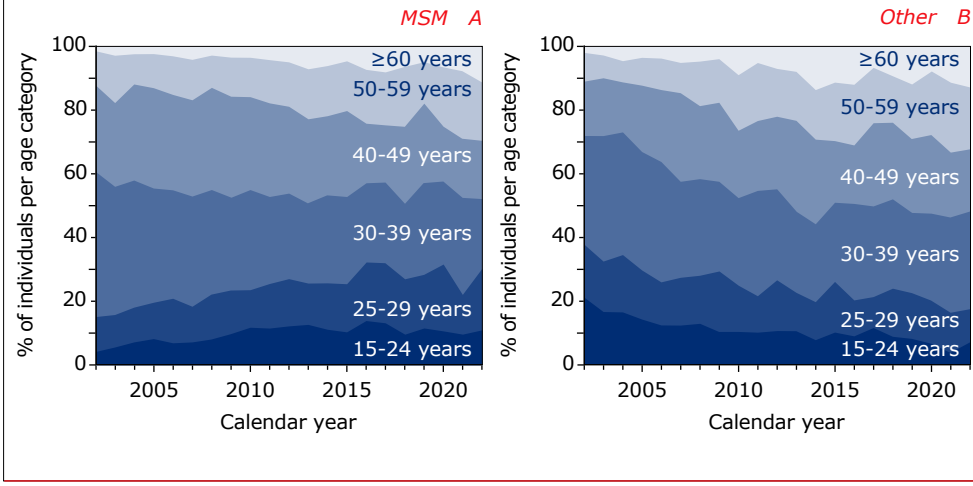
It is worth noting that although the median age at diagnosis in MSM (39 years) did not change between 2002 and 2022, both the proportion diagnosed below 30 years of age and the proportion diagnosed above 50 years of age increased during this period. In 2002, 15% of MSM were younger than 30 years at the time of their diagnosis while 12% were 50 years of age or older; these proportions were 31% and 30%, respectively, in 2022. 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 2022, the annual number of diagnoses among MSM 30 to 50 years of age decreased by 82%, from 464 to 85. During the same period, the number of diagnoses decreased from 181 to 65, or 64%, in MSM younger than 30 years, and from 123 to 63, or 49%, in MSM 50 years of age or older.

There were some age differences between MSM, other men, and women diagnosed in 2020-2022. MSM born in the Netherlands were diagnosed at a median age of 46 years (IQR 32-56), while MSM of foreign origin were diagnosed at a much younger median age of 32 years (27-40). Men other than MSM were 45 years (35-54) of age at the time diagnosis, which was somewhat older than the median age of 39 years (30-51) for women. In 2022, 30% of MSM, 42% of other men, and 26% of women were 50 years or older at the time of diagnosis.

Young people

Between 2002 and 2022, 2,055 (11%) individuals who received an HIV diagnosis at 15 years of age or older were under 25 years of age (*Figure 1.6*). In 2022, 37 young people (all aged 18 or older) were diagnosed with HIV, which amounted to 9% of all people diagnosed with HIV that year. The number of young individuals diagnosed in 2022 was 24 (12%) among MSM, none among other men, and 13 (19%) among women. Of the 37 young people, 16 (43%) were born in the Netherlands, while eight originated from South America, five from central Europe, three from sub-Saharan Africa, two from the Caribbean, and three 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 2002-2022, the proportion of individuals between 15 and 29 years of age changed from 15% to 31% for MSM, and from 38% to 18% 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 30%, while these proportions were 11% and 32% for other individuals.



Legend: MSM = men who have sex with men.

Entry into care

Of the 1,177 individuals diagnosed with HIV in 2020-2022 for whom the diagnosis setting was known, 58% entered HIV care within a week of diagnosis, 83% within two weeks, 96% within four weeks, and 97% within six weeks. For individuals diagnosed in 2022, these proportions were 58%, 84%, 95%, and 97%, respectively. The proportion in care within four weeks was 94% 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 (96%), at a general practice (95%), or at other locations (98%). 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%).

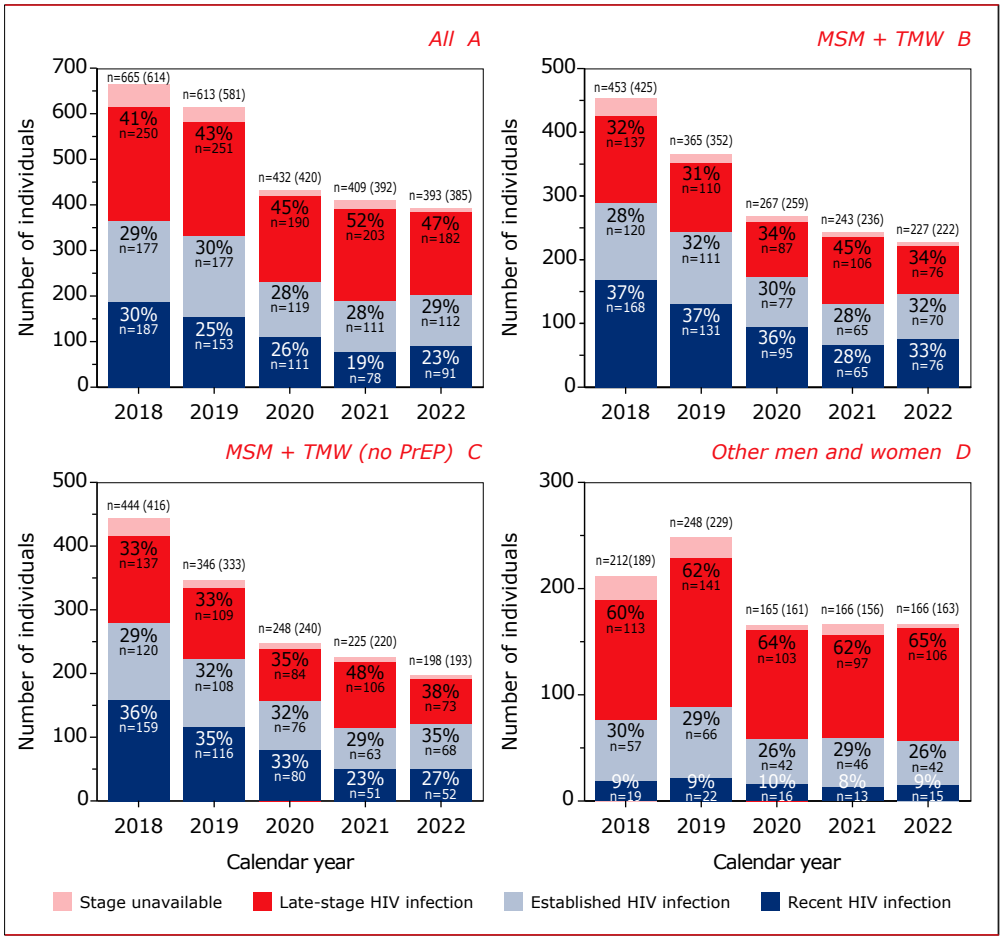
Stage at time of HIV diagnosis

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[3].
- 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.

Between 2018 and 2022, the proportion of individuals diagnosed with recent HIV infection decreased from 30% to 24%, while the proportion with late-stage HIV increased from 41% to 47% (*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 58% in 2022. Besides, changes in the 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 2018-2022 (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 HIV 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, 48% of the individuals diagnosed in 2020-2022 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, and then increased to 45% in 2020, 52% in 2021, and 47% in 2022 (*Figure 1.8A*). This increase 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 32% in 2022 (*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 261 (45%) of all 575 individuals diagnosed with late-stage HIV in 2020-2022.

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

Among individuals diagnosed with HIV in 2020-2022, 261 (38%) MSM, 186 (69%) other men, and 120 (57%) women had a late-stage HIV infection. Late-stage HIV infections, in relative terms, were most common among people originating from sub-Saharan Africa (65%, or 73 individuals), from south and southeast Asia (61%, 28 individuals), or from central Europe (55%, or 63 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 2020-2022, late-stage HIV was seen in 55% of MSM, 85% of other men, and 67% of women aged 60 years or older, compared with 30% of MSM, 38% of other men, and 38% of women diagnosed below the age of 30 years (*Table 1.2; Figure 1.9*).

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 2022, 182 (47%) individuals were diagnosed with late-stage HIV infection: 72 (34%) men who have sex with men (MSM), 67 (71%) other men, 39 (57%) women, and 4 (31%) trans men and women. During the same year, 122 (32%) individuals were diagnosed with advanced-stage HIV infection: 44 (21%) MSM, 45 (48%) other men, 31 (45%) women, and 2 (15%) trans men and women. 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 2020-2022, the stage of infection was unknown for 37 (3%) individuals.*

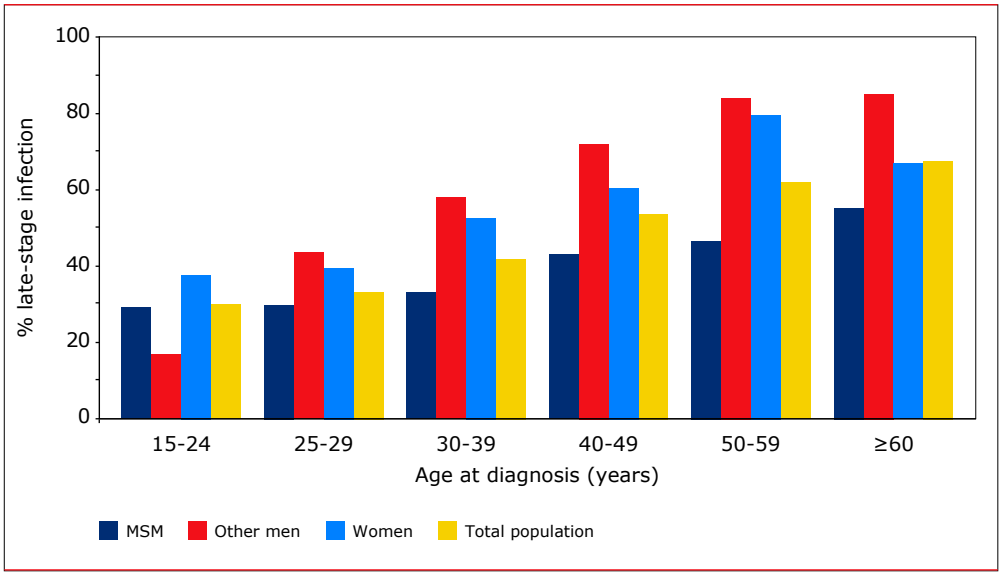
Legend: *MSM = men who have sex with men.*

Table 1.2: *Characteristics of the 575 individuals with a late-stage HIV infection among the 1,234 individuals diagnosed with HIV in 2020-2022. In total, as a result of missing CD4 cell counts at diagnosis, it was not possible to classify whether 37 (3%) individuals (19 MSM, 11 other men, 6 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=681)		Other men (n=270)		Women (n=210)		Trans men and women (n=36)		Total (n=1,197)	
	n	%	n	%	n	%	n	%	n	%
Overall	261	38	186	69	120	57	8	22	575	48
Age at diagnosis (years)										
15-24	20	29	1	17	9	38	0	0	30	30
25-29	35	30	10	43	11	39	4	31	60	33
30-39	59	33	44	58	32	52	3	21	138	42
40-49	54	43	49	72	23	61	0	0	126	53
50-59	61	47	48	84	35	80	1	33	145	62
60-69	20	44	23	82	9	64	0	0	52	60
≥70	12	92	11	92	1	100	0	0	24	92
Region of origin										
Western	*170*	*38*	*104*	*72*	*43*	*51*	*2*	*29*	*319*	*47*
The Netherlands	157	38	102	73	39	49	2	29	300	47
Other western*	13	35	2	50	4	80	0	0	19	41
Non-Western	*91*	*39*	*82*	*65*	*77*	*62*	*6*	*21*	*256*	*50*
Sub-Saharan Africa	3	30	28	74	42	65	0	0	73	65
Central Europe	34	49	20	67	9	64	0	0	63	55
South America	17	30	9	82	6	40	3	19	35	36
Caribbean	11	44	4	36	3	33	2	29	20	38
South and southeast Asia	15	54	5	72	7	88	1	33	28	61
North Africa and the Middle-East	5	31	11	61	1	50	0	0	17	47
Other/unknown	6	21	5	45	9	75	0	0	20	36
Location of HIV diagnosis										
Sexual health centre	56	21	13	48	3	17	3	19	75	23
Hospital	117	70	124	83	83	80	3	43	327	77
General practice	67	34	39	57	21	38	0	0	127	38
Other/unknown	21	47	10	42	13	39	2	40	46	43
Last negative test†										
1-2 years	26	35	4	33	2	22	2	33	34	33
2-4 years	23	35	10	59	6	46	2	50	41	41
≥4 years	66	67	26	74	33	70	0	0	125	68
Never tested / not available	146	66	146	80	79	65	4	44	375	70

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 2020-2022 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 (77%) than among those who were tested at a general practice (38%), a sexual health centre (23%), or another testing location (43%). 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 76% in 2022. Late diagnosis was less common (37%) 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 (68%) or who did not report ever having tested for HIV before (70%).

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 575 people diagnosed with late-stage HIV infection in 2020-2022, 249 (43%) were hospitalised within a year of diagnosis, including 206 (36%) as a direct result of their HIV infection. In contrast, only 66 (11%) of the 622 individuals diagnosed with recent or established HIV infection were hospitalised within a year of diagnosis, including

19 (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 575 individuals diagnosed with late-stage HIV infection in 2020-2022, 23 (4%) died within a year of diagnosis, including 16 (3%) who died of AIDS (*Table 1.3*). Among the 622 people diagnosed with recent or established HIV infection, 6 (1%) died with a year of diagnosis, including no one who died of AIDS.

Table 1.3: *Number and proportion of individuals diagnosed in 2020–2022 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	622	66	11	19	3	6	1	0	0
Late-stage HIV infection	575	249	43	206	36	23	4	16	3
CD4 200–349, no AIDS	167	20	12	10	6	1	1	0	0
CD4 <200, no AIDS	187	55	29	32	17	4	2	3	2
AIDS	221	174	79	164	74	18	8	13	6

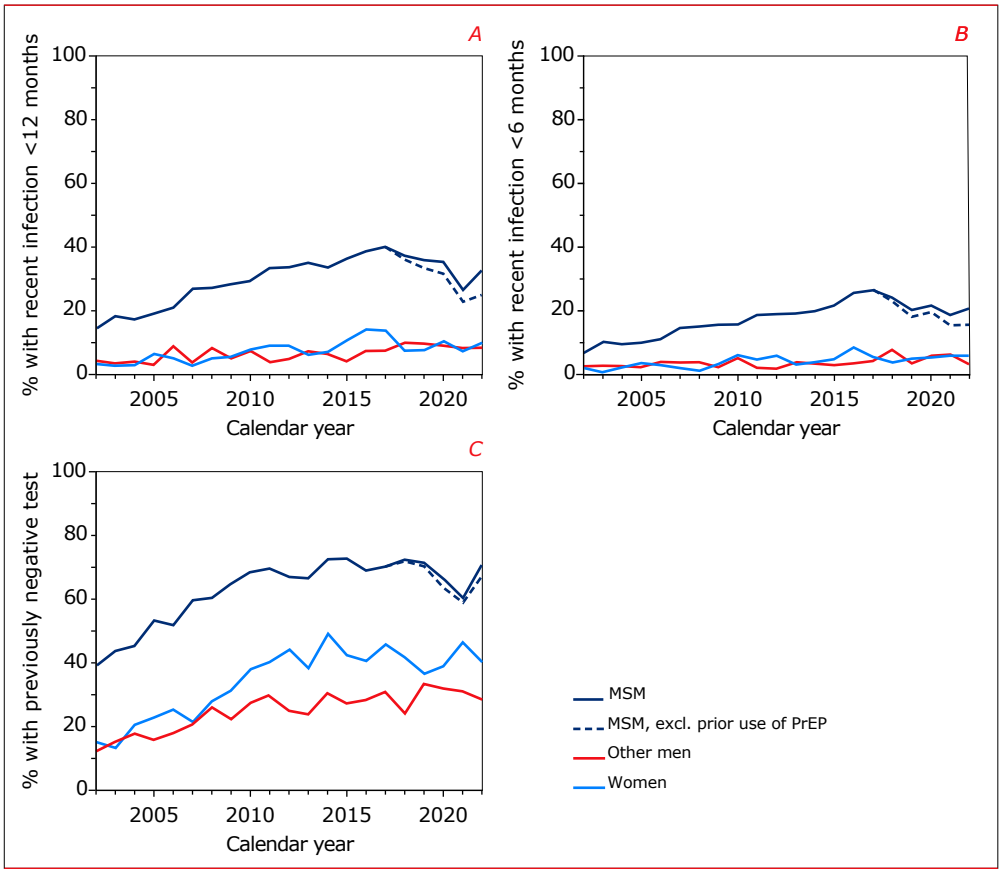
Late diagnosis and prior use of PrEP

Among MSM and trans men and women diagnosed in 2020-2022, 269 (38%) 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 263, 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 2020-2022, 23% 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 32% and 20%, respectively, while they were similar for trans men and women, 38% and 22%, respectively. Among other men and among women these proportions were considerably lower (9% and 5%, respectively).

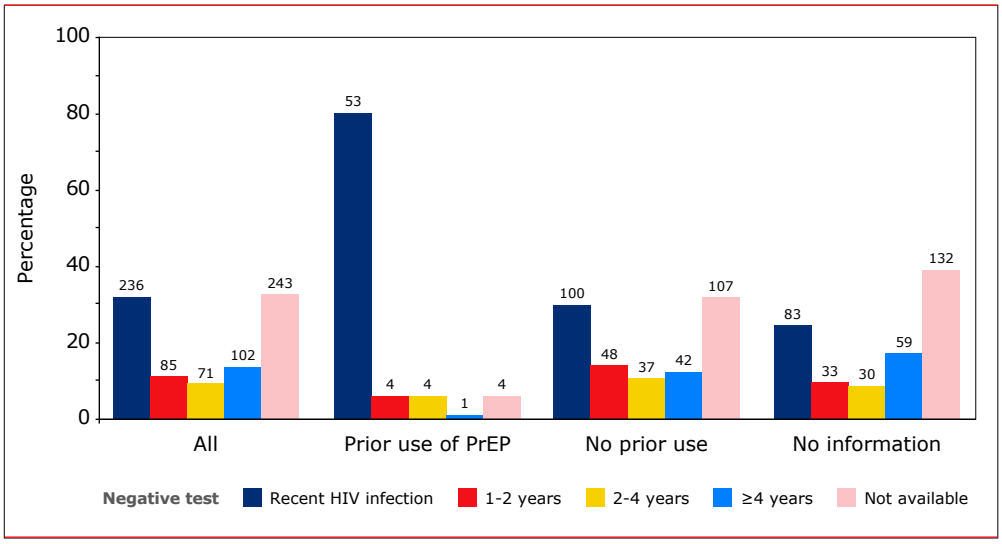
Figure 1.10: *Proportion of people diagnosed (A) with evidence of having acquired their HIV infection at most 12 months prior to their diagnosis, (B) at most 6 months prior to their diagnosis, (C) with a previously negative test at any time prior to their diagnosis. Evidence of a recent infection was (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, 70 (33%) men who have sex with men (MSM), or 46 (25%) MSM when excluding those who reported prior use of pre-exposure prophylaxis (PrEP), 8 (8%) other men, 7 (10%) women, 6 (43%) trans men and women, and 91 (23%) of all 393 individuals diagnosed in 2022 had evidence of having acquired HIV at most 12 months before diagnosis. In the same year, 44 (21%) MSM, or 29 (16%) MSM when excluding those who reported prior use of PrEP, 3 (3%) other men, 4 (6%) women, 2 (14%) trans men and women, and 53 (13%) of all 393 individuals had evidence of having acquired HIV at most six months before diagnosi.*



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 36% in 2018-2020, appeared to be lower, 27%, in 2021, and then increased to 33% in 2022 (*Figure 1.10A*). This increase in 2022 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, 23% in 2021 and 25% in 2022. 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, 80%, 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 2020–2022 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.*

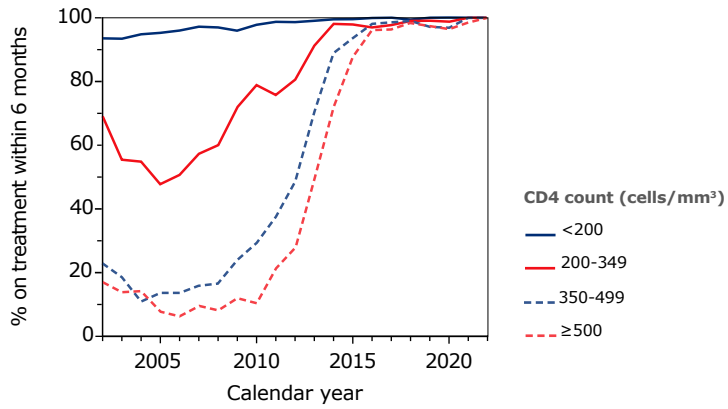


The proportion of people with a recorded previously negative HIV test any time before their HIV diagnosis increased from 25% in 2002 to 55% in 2022. MSM were more likely to have a previously negative HIV test than other men and women. In 2022, 71% of MSM newly diagnosed with HIV had a previously negative test, which was similar to 70% of MSM diagnosed in the period 2018-2020, but higher than 60% of MSM diagnosed in 2021 (*Figure 1.10C*). Overall, of MSM diagnosed in 2020-2022, 66% reported a previously negative test, meaning that a third (33%) never had an HIV test before their HIV diagnosis (see also *Figure 1.11*). The proportion with a negative test among other men and women diagnosed in 2022 was 28% and 40%, respectively, which was similar to the proportions in 2018-2021 (30% and 40%, respectively). The proportion with a known previously negative test was highest among those diagnosed at a sexual health centre (77%), compared with 31% of those diagnosed in a hospital, and 67% of those diagnosed at a general practice.

Antiretroviral therapy

Of the 27,035 individuals diagnosed at 15 years of age or older, 26,166 (97%) had started antiretroviral therapy (ART) by May 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[4]. 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 2022, across all CD4 strata, at least 95% 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. Individuals were considered only if they had more than six months of follow up after diagnosis. Of all individuals diagnosed in 2020–2022, 100% of those with CD4 counts below 200 cells/mm³, 99% of those with CD4 counts between 200 and 349 cells/mm³, 99% of those with CD4 counts between 350 and 499 cells/mm³, and 98% of those with CD4 counts of 500 cells/mm³ or above 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)[5–8]. Hence it is crucial to minimise the time between the moment a person acquires HIV and the point at which they achieve this threshold[9], 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 2022, the median time from diagnosis to reaching a viral load level below 200 copies/ml decreased from 0.85 years (IQR 0.38-2.64) to 0.16 years (IQR 0.11-0.27), or from 10.2 months (IQR 4.5-31.7) to 1.9 months (IQR 1.4-3.3). The median time to reaching a viral load level below 1,000 copies/ml was somewhat shorter, being 0.56 years (IQR 0.24-2.12) years, or 6.7 months (IQR 2.9-25.4), in 2010, and 0.14 years (IQR 0.10-0.20), or 1.7 months (IQR 1.2-2.4) in 2022. 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 2022, this was estimated to be a median of 3.5 years (IQR 1.7-6.4).

Population in care

In total, 21,987 (72%) of the 30,598 individuals with HIV-1 ever registered in the Netherlands were known to be in clinical care by the end of 2022 (*Figure 1.1*; *Table 1.4*). People were considered to be in clinical care if they had visited their treating physician in 2022, or had a CD4 count or HIV RNA measurement in that year, and were still living in the Netherlands. Of the 8,611 people who were not in care by the end of 2022, 3,950 (46%) had died, of whom 2,147 (54%) died before the end of 2012. Another 2,398 (28%) had moved abroad, including 899 (37%) who did so before the end of 2012. The remaining 2,263 (26%) individuals:

- were lost to care (2,112, 93%);
- were only diagnosed with HIV in 2023 (68, 3%);
- had only moved to the Netherlands in 2023 (32, 1%); or
- had newly entered care in 2023 (51, 2%).

Of the people who moved abroad, 1,893 (79%) had RNA levels below 200 copies/ml at their last viral load measurement; in those lost to care, that figure was 1,378 (65%).

Table 1.4: Characteristics of the 21,987 people with HIV-1 in clinical care by the end of 2022.

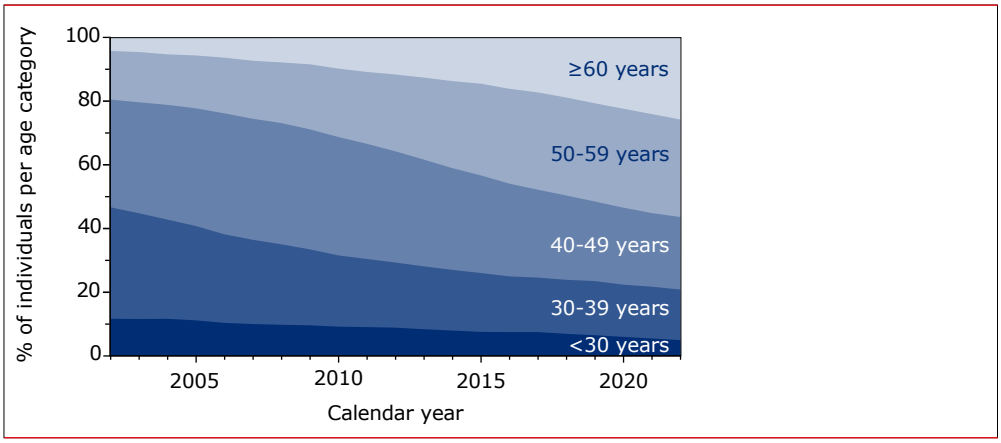
	MSM (n=13,621, 62%)		Other men (n=3,974, 18%)		Women (n=4,120, 19%)		Trans men and women (n=272, 1%)		Total (n=21,987)	
	n	%	n	%	n	%	n	%	n	%
Transmission										
Sex with men	12,591	93	0	0	3,575	87	213	78	16,379	74
Sex with women	8	0	2,577	65	1	0	7	3	2,593	12
Sex, unspecified	944	7	93	2	0	0	22	8	1,059	5
IDU	11	0	199	5	84	2	0	0	294	1
Blood/blood products	15	0	180	5	109	3	4	2	308	1
Other/unknown	52	0	925	23	351	9	26	10	1,354	6
Current age (years)										
0–14	0	0	58	0	6	2	0	0	124	1
15–24	101	1	65	2	98	2	7	3	271	1
25–29	501	4	93	2	129	3	21	8	744	3
30–39	2,161	16	518	13	700	17	109	40	3,488	16
40–49	2,893	21	804	20	1,192	30	68	25	4,957	23
50–59	4,225	31	1,243	31	1,196	29	55	20	6,719	31
60–69	2,680	20	848	21	546	13	11	4	4,085	19
≥70	1,060	8	345	9	193	5	1	0	1,599	7
Region of origin										
The Netherlands	9,172	67	1,850	47	1,206	29	52	19	12,280	56
Sub-Saharan Africa	212	2	917	23	1,598	39	6	2	2,733	12
Western Europe	846	6	141	4	113	3	12	4	1,112	5
Central Europe	491	4	159	4	102	2	2	1	754	3
Eastern Europe and Central Asia	218	2	129	3	183	4	4	1	534	2
South America	1,029	8	280	7	362	9	105	39	1,776	8
Caribbean	577	4	177	4	191	5	54	20	999	5
South and southeast Asia	460	3	100	3	255	6	27	10	842	4
Other	541	4	193	5	95	2	9	3	838	4
Unknown	75	1	28	1	15	0	1	0	119	1
Years aware of HIV infection										
<1	215	2	95	2	72	2	13	5	395	2
1–2	505	4	198	5	163	4	27	10	893	4
3–4	871	6	262	7	217	5	26	10	1,376	6
5–10	3,003	22	731	18	637	14	52	19	4,423	20
10–20	5,850	43	1,605	40	1,770	43	107	39	9,332	42
20–30	2,477	18	912	23	1,068	26	39	14	4,496	20
>30	688	5	156	4	179	4	5	2	1,028	5
Unknown	12	0	15	0	14	0	3	1	44	0

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

Ageing population

The median age of the population in clinical care by the end of 2022 was 52 years (IQR 42-60). This figure has been increasing since 2002 (*Figure 1.13*), which is mainly a result of the improved life expectancy of people with HIV following the introduction of combination antiretroviral therapy (ART). Moreover, individuals are being diagnosed at an increasingly older age, as discussed earlier in this chapter. Consequently, approximately half of those currently in care (56%) are 50 years or older (58% of MSM, 59% of other men, 47% of women, and 25% of trans men and women), and 26% are 60 years or older. As the population with HIV continues to age, the number of individuals with age-related comorbidities also increases. These conditions are known to complicate HIV infection management (see *Chapter 3*).

Figure 1.13: *Increasing age of the population with HIV-1 in clinical care over calendar time. In 2002, 12% of the individuals in care were younger than 30 years of age, whereas 20% were 50 years or older. In 2022, these proportions were 5% and 56%, respectively, while 26% of individuals in care were 60 years of age or older. The proportion of individuals in clinical care as of 31 December each calendar year is shown according to age category: <30 years of age, 30-39 years, 40-49 years, 50-59 years, and 60 years or older.*



Duration of infection

People in clinical care by the end of 2022 were known with HIV for a median of 13.8 years (IQR 8.4-20.1). Therefore, a large group (68%) of those in care have been living with HIV for more than 10 years, including 25% who have done so for more than 20 years. The median time since diagnosis was 13.3 years for men who have sex with men (MSM), 14.2 years for other men, 15.9 years for women, and 11.0 years for trans men and women.

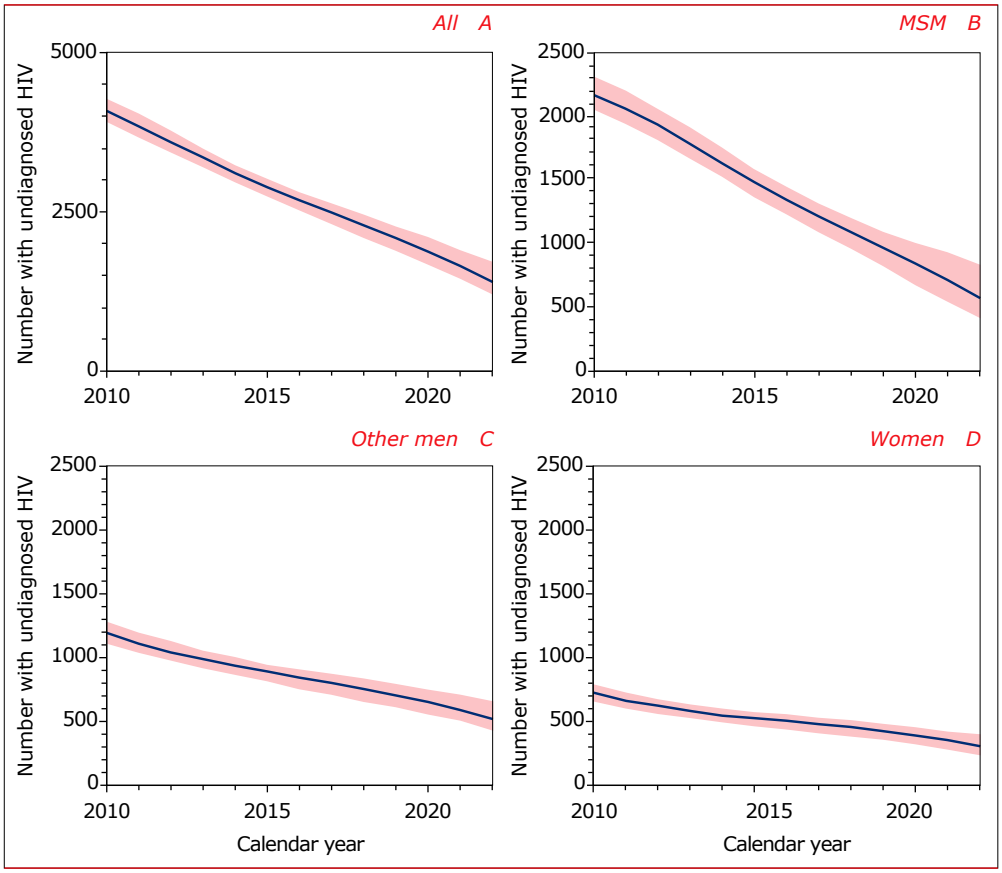
Treated population

By the end of 2022, almost all individuals in care had started ART, and 96% of them were using a once-daily regimen. Of the 115 individuals who had not yet started ART by the end of 2022, 13 (11%) were known to have started therapy in 2023, while another 31 (27%) individuals were diagnosed with HIV in 2022, so it is likely that their therapy has yet to be recorded in the SHM database. ART is discussed in more detail in *Chapter 2*.

Undiagnosed population

The estimated number of people with an undiagnosed HIV infection decreased from 4,080 (95% CI 3,910-4,270) in 2010 to 1,390 (1,210-1,710) in 2022, representing a reduction of 66% (58-70) (*Figure 1.14A*). This decrease was mostly driven by MSM, among whom the number of undiagnosed HIV cases fell by 74% (61-82) from 2,170 (2,050-2,320) in 2010 to 570 (410-840) by the end of 2022 (*Figure 1.14B*). Among other men, the estimated number with undiagnosed HIV was 1,190 (1,110-1,280) in 2010 and 520 (420-660) in 2022, while in women these numbers were 720 (650-780) and 300 (230-400), respectively (*Figures 1.14C* and *1.14D*).

Figure 1.14: *Estimated number of people with undiagnosed HIV in the Netherlands: (A) overall, (B) men who have sex with men (MSM), (C) other men, and (D) women, according to the European Centre for Disease Prevention and Control (ECDC) HIV Platform Tool[110]. Estimates for the overall population do not include trans individuals and children.*



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

Continuum of HIV care – national level

The total number of people with HIV by the end of 2022 was 24,400 (95% CI 24,220-24,720), including the estimated 1,390 (1,210-1,710) who remained undiagnosed[10]. Adjusted for registration delays, of this total:

- 23,011 individuals (94% of the total number of people with HIV) had been diagnosed, linked to care, and registered by SHM;
- 22,102 (91%, or 96% of those diagnosed and linked to care) were retained in care (i.e. they had at least one documented HIV RNA or CD4 count measurement, or a clinic visit in 2022) (*Figure 1.15A*);
- 21,978 (90%, or 96% of those diagnosed and linked to care) had started ART;
- 21,251 (87%, or 97% of those treated) had a most recent HIV RNA measurement below 1,000 copies/ml;
- 21,094 (86%, or 96% of those treated) had a most recent HIV RNA measurement below 200 copies/ml; and
- 20,537 (84%, or 93% of those treated) had a most recent measurement below 50 copies/ml.

The estimated total number of people with HIV and the number diagnosed and linked to care excluded 307 people who, according to data from Statistics Netherlands, had died or moved abroad by the end of 2022 but whose date of death or migration had not been recorded in the SHM database.

Overall, 86% of the total estimated population with HIV and 92% of those diagnosed and ever linked to care had a suppressed viral load below 200 copies/ml. This means that by 2022 the Netherlands had almost reached the Joint United Nations Programme on HIV/AIDS (UNAIDS) 95-95-95 target for 2025; with the estimate standing at 94-96-96, or 94-96-97 if 1,000 copies/ml, and 94-96-93 if 50 copies/ml is used as a threshold of viral suppression[11]. Of the people still in care by the end of 2022, 16,183 (76%, or 78% of those with a CD4 measurement) had a most recent CD4 count of 500 cells/mm^3 or higher, which was measured, at most, three years earlier.

Viral suppression

In total, 865 individuals (without adjusting for registration delays) had started therapy but did not have a suppressed viral load below 200 copies/ml by the end of 2022. On closer inspection, 380 (44%) of these individuals did not have an HIV RNA measurement available in 2022; 273 (72%) of these 380 individuals had an RNA level below 200 copies/ml at their last measurement in 2021.

Of the 485 (56%) people with a viral load measurement and a viral load level above 200 copies/ml, 63 (13%) started therapy after their last available viral load measurement in 2022. Another 29 (6%) had only started therapy in the six months prior to that last measurement and may not have had sufficient follow up to achieve a documented suppressed viral load.

Lost to care

Based on SHM data only, 2,112 individuals were lost to care by the end of 2022, and of these:

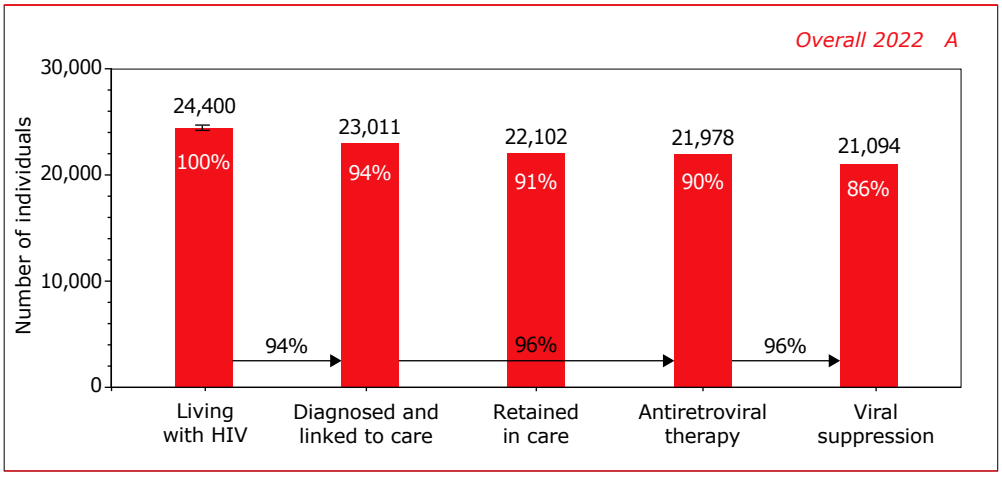
- 952 (45%) were last seen for care before the end of 2012;
- 584 (28%) in 2013-2018;
- 116 (5%) in 2019;
- 148 (7%) in 2020; and
- 312 (15%) in 2021[b].

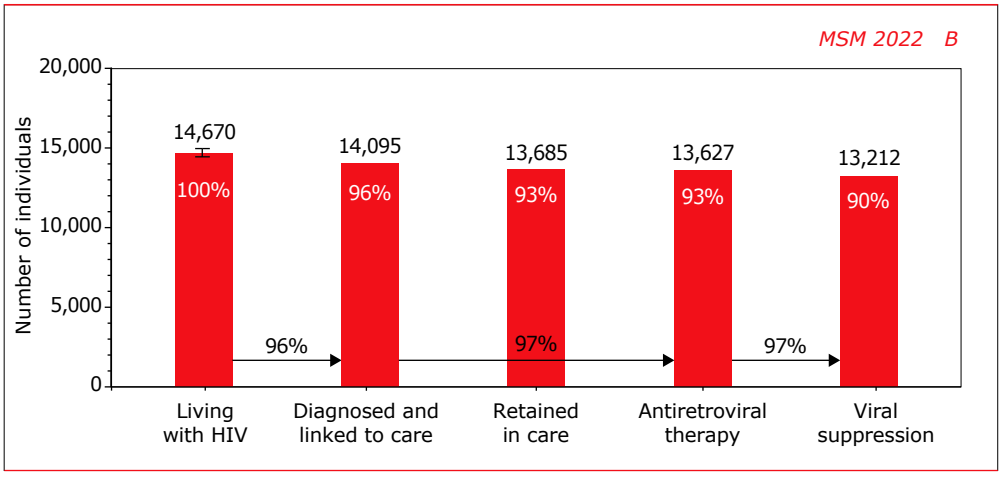
The 952 individuals who were lost to care in or before 2012, were excluded from the estimated number of people with HIV and the number of people diagnosed and linked to care. It was assumed to be unlikely that these 952 individuals were still living in the Netherlands by the end of 2022 without requiring care or ART during that ten-year period.

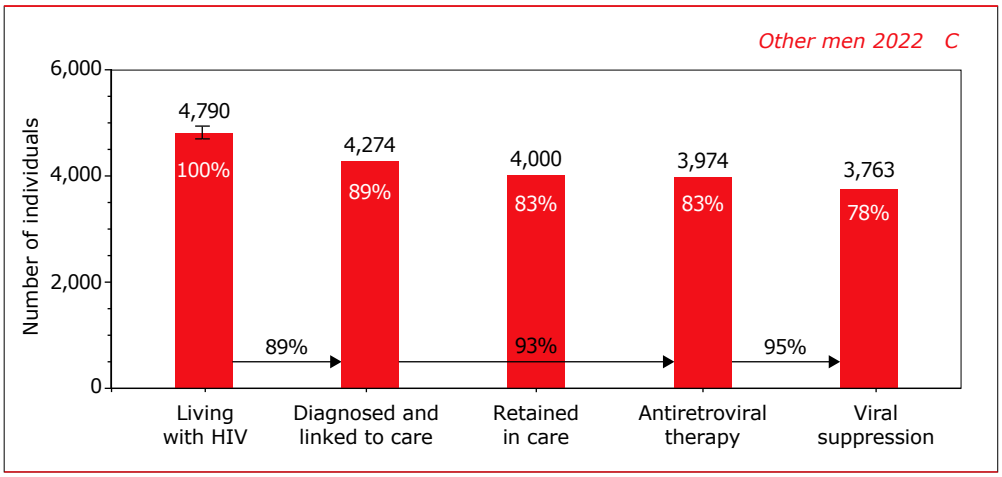
Of the 1,160 individuals lost to care after 2012, 68% were born outside the Netherlands; this proportion was only 44% for those who were still in care by the end of 2022. This suggests that some of those lost to care may have moved abroad; in particular, back to their country of birth. Indeed, according to data from Statistics Netherlands, 259 (22%) of the 1,160 individuals lost to care after 2012 had moved abroad, while another 48 (4%) had died by the end of 2022. It should be pointed out that 163 (14%) individuals were lost to care because they had planned transfer of care to another treatment centre, but there was no confirmation that they did indeed register at a new centre.

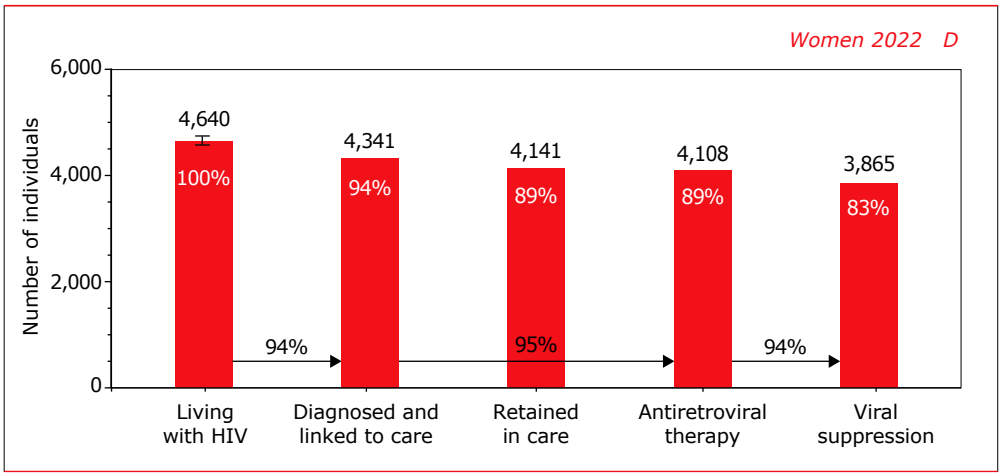
b In addition to the 2,112 individuals lost to care there were 51 individuals who had already been diagnosed by the end of 2022 and were living in the Netherlands but entered care in 2023. These 51 individuals (55 with adjustment for registration delay), as well as the 853 (1,160 minus 307) lost to care after 2012 (854 with adjustment), are counted in the first and second stage of the continuum but not in the other stages.

Figure 1.15: *Continuum of HIV care for people with HIV in the Netherlands by the end of 2022: (A) the total population with HIV-1, (B) men who have sex with men (MSM), (C) other men, and (D) women. Percentages at the top of the bars are calculated relative to the number with HIV, while percentages at the bottom correspond to the UNAIDS' 95-95-95 targets for 2025. Numbers were adjusted to reflect reporting delays, while the numbers in the first two bars in each panel were also adjusted using data on death and migration from Statistics Netherlands.*









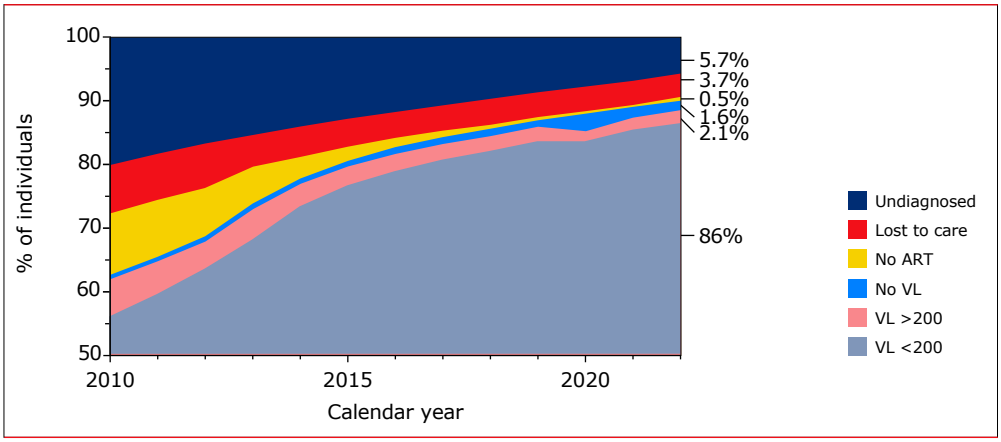
Legend: *MSM = men who have sex with men.*

Transmittable levels of virus

The proportion of people with HIV living in the Netherlands (at the end of each calendar year) who had a confirmed viral load level below 200 copies/ml, grew steadily between 2010 and 2022 (*Figure 1.16*). In 2010, 56% of the estimated 20,300 (95% CI 20,130-20,490) people with HIV had a suppressed viral load below 200 copies/ml, while this proportion was 86% in 2022. During the same period, the proportion with a viral load below 1,000 copies/ml grew from 58% in 2010 to 87% in 2022. This increase was mainly the result of a reduction in the proportion of people unaware of their infection, from 20% in 2010 to 6% in 2022, and, to a lesser extent, of a smaller proportion not yet on ART (10% in 2010, 0.5% in 2022).

The number of individuals with HIV who were likely to have an unsuppressed viral load by the end of 2022 was estimated to be 3,311, or 14% of all people with HIV, which is the difference between the first and the last stage in the HIV care continuum. These individuals may still pass HIV onto uninfected individuals. This number is likely to be an overestimate of the true number with an unsuppressed viral load in the Netherlands because, as discussed above, some of the people who were lost to care may have moved abroad and may be receiving HIV care outside the Netherlands. Additionally, 2% of all people with HIV had no viral load measurement in 2022 but it is likely that many now have viral load levels below 200 copies/ml, as they all started ART.

Figure 1.16: *Estimated proportions of people with HIV across the various stages in the HIV care continuum. Proportions in 2013–2022 were adjusted using data on death and migration from Statistics Netherlands. The numbers to the right of the graph are the proportions in 2022.*



Legend: *ART = antiretroviral therapy; VL = viral load.*

Continuum of care in MSM, other men, and women

The number of MSM with HIV at the end of 2022 was estimated at 14,670 (95% CI 14,510-14,930), of whom 570 (410-840) had yet to be diagnosed. Of these:

- 14,095 (96%) had been diagnosed and linked to care;
- 13,685 (93%) were still in care;
- 13,627 (93%) had started ART; and
- 13,212 (90%) had a most recent HIV RNA below 200 copies/ml, while 13,280 (91%) had a viral load below 1,000 copies/ml.

In terms of the 2025 UNAIDS 95-95-95 target, this translates to 96-97-97, meaning that in MSM, the UNAIDS targets have already been met (*Figure 1.15B*). In total, 10,461 (71%, or 81% of those with a CD4 measurement) of MSM still in care by the end of 2022 had a CD4 count of 500 cells/mm^3 or higher at their last measurement in 2020-2022.

Among other men, the estimated number with HIV in 2022 was 4,790 (95% CI 4,700-4,930), including 520 (420-660) who were not yet diagnosed (*Figure 1.15C*). Of these:

- 4,274 (89%) men had been diagnosed and linked to care;
- 4,000 (83%) were still in care;
- 3,974 (83%) had started ART; and
- 3,763 (78%) had a suppressed viral load below 200 copies/ml, while 3,806 (79%) had a viral load below 1,000 copies/ml.

The number of women with HIV was estimated to be 4,640 (95% CI 4,570-4,740), of whom 300 (230-400) were not yet diagnosed (*Figure 1.15D*). Of these women:

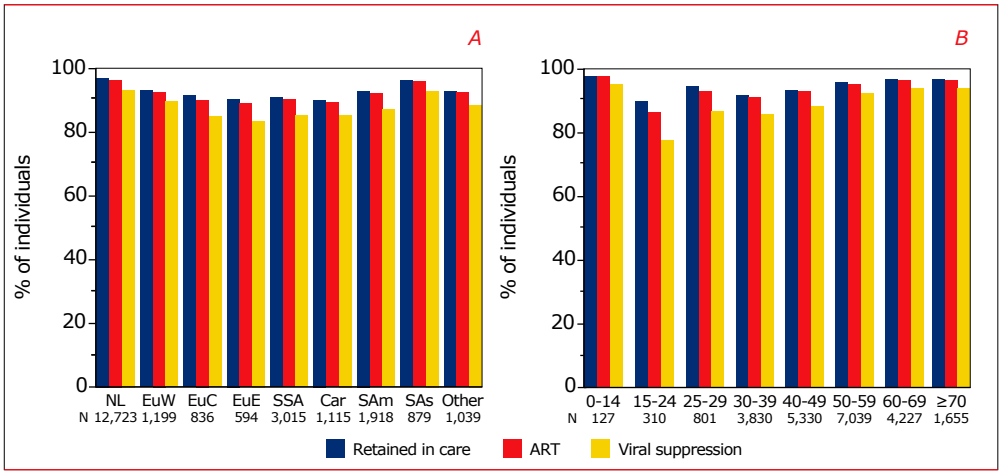
- 4,341 (94%) had been diagnosed and linked to care;
- 4,141 (89%) were still in care;
- 4,108 (89%) had started ART; and
- 3,865 (83%) had a suppressed viral load below 200 copies/ml, while 3,910 (84%) had a viral load below 1,000 copies/ml.

Among women and other men still in care by the end of 2022, the proportion with viral suppression was 94%, which was somewhat lower than among MSM (97%).

Continuum of care by region of origin and age

Individuals of Dutch origin generally engaged more with the various stages of the care continuum than people from other countries (*Figure 1.17A*). Engagement with all stages of the care continuum was highest among the youngest age group. Levels of engagement were generally lower in the other age groups, but both the proportion of people who were still in care and the proportion who had started ART by the end of 2022, increased with age, and exceeded 95% in people aged 50 years or older (*Figure 1.17B*). As a consequence, the proportion of people with viral suppression also increased with age; rising from 78% among those aged 15 to 24 years, to more than 90% for people aged 50 years or older.

Figure 1.17: Continuum of HIV care: (A) by region of origin, and (B) by age group (in years) for the total population with HIV-1. Proportions are given relative to the number of people diagnosed and linked to care, which are shown below the figures.



Legend: NL = the Netherlands; EuW = western Europe; EuC = central Europe; EuE = eastern Europe and Central Asia; SSA = sub-Saharan Africa; Car = Caribbean; Sam = South America; SAs = south and southeast Asia; Other = other regions of origin; ART = antiretroviral therapy.

Continuum of care 2021

We re-estimated the continuum of HIV care for 2021 and found that, by the end of that year, there were 24,390 (95% CI 24,190-24,650) people with HIV in the Netherlands, which was somewhat higher than the estimated 24,110 (23,910-24,500) outlined in last year's report[12]. The number diagnosed (22,746 compared to 22,712), the number retained in care (21,511 compared to 21,502), and the number of those who started ART (21,430 compared to 21,397) were very similar to last year's report, while the number with viral suppression (20,600 compared to 20,490) was also somewhat higher in the re-estimation. This is because the modest backlog in the collection of 2021 data on viral load measurements has now been cleared. The number of people with HIV and the number diagnosed in 2021 decreased to 24,080 (95% CI 23,880-24,340) and 22,436, respectively, after excluding 310 people who, according to data from Statistics Netherlands, had died (29) or moved abroad (281) by the end of 2021 but whose date of death or migration had not been recorded in the SHM database.

Continuum of HIV care – regional level

We also determined the continuum of care (including the first stage: estimated number of people with HIV) for the eight STI surveillance regions[c] in the Netherlands, and for the four largest cities in the country (*Table 1.5*). By the end of 2022, more than half (54%) of all estimated people with HIV were living in Noord-Holland/Flevoland and in Zuid-Holland Zuid, which include the cities of Amsterdam and Rotterdam. In total an estimated 520 (40%) people with undiagnosed HIV were living in these two regions. All eight regions had reached or were close to reaching most of the UNAIDS' 95-95-95 targets for 2025, and the proportion of all people with HIV who had a suppressed viral load below 200 copies/ml varied between 82% and 89%, or between 83% and 90% when considering a viral load below 1,000 copies/ml. Those diagnosed and linked to care showed similar levels of engagement in the various stages of the care continuum across all 25 public health service regions in the Netherlands (*Table 1.6*).

c Reporting to the national STI surveillance system is organised in eight regions, which each consist of one or more public health service regions (see also Table 1.6).

Table 1.5: Continuum of care by the end of 2022 for the total population with HIV-1 living in the Netherlands in each of the eight sexually-transmitted infection (STI) surveillance regions, or in one of the four major cities. For each region or city, percentages on the first row are relative to the estimated number of people with HIV, while those on the second row correspond to UNAIDS' 95-95-95 targets. For 192 individuals diagnosed and linked to care, region of residence was unknown.

	Estimated population with HIV		Diagnosed and linked to care	
	Undiagnosed	Total		
	n	n	n	%
Region				
Noord	150	1,510	1,359	90
	90-230	1,450-1,590		90
Oost	130	2,750	2,623	95
	100-170	2,720-2,790		95
Noord-Holland/Flevoland	260	9,190	8,931	97
	220-310	9,150-9,240		97
Utrecht	60	1,400	1,340	96
	40-80	1,380-1,420		96
Zuid-Holland Noord	170	1,890	1,721	91
	110-230	1,830-1,950		91
Zuid-Holland Zuid	260	3,910	3,645	93
	200-370	3,840-4,010		93
Zeeland/Brabant	200	2,690	2,486	93
	150-260	2,630-2,750		93
Limburg	70	1,090	1,020	93
	50-120	1,070-1,140		93
Total	1,300	24,420	23,126	95
	1,170-1,460	24,300-24,590		95
City				
Amsterdam	140	6,380	6,236	98
	120-210	6,350-6,440		98
Rotterdam	110	2,130	2,022	95
	70-160	2,090-2,180		95
Den Haag	110	1,340	1,229	92
	70-170	1,290-1,400		92
Utrecht	20	570	556	97
	10-30	570-590		95
Total	370	10,420	10,043	96
	310-480	10,350-10,530		96

	Retained in care		Antiretroviral therapy		Viral suppression	
	n	%	n	%	n	%
	1,295	86	1,290	86	1,245	83
				95		97
	2,538	92	2,526	92	2,428	88
				96		96
	8,456	92	8,418	92	8,080	88
				94		96
	1,287	92	1,282	92	1,243	89
				96		97
	1,644	87	1,629	86	1,553	82
				95		95
	3,456	88	3,419	87	3,270	84
				94		96
	2,359	88	2,349	87	2,260	84
				94		96
	950	87	950	87	908	83
				93		96
	21,985	90	21,862	90	20,987	86
				95		96
	5,917	93	5,895	92	5,677	89
				95		96
	1,911	90	1,889	89	1,804	85
				93		96
	1,174	88	1,160	87	1,106	83
				94		95
	536	93	533	93	519	90
				96		97
	9,538	92	9,476	91	9,106	87
				94		96

In total, 10,420 (95% CI 10,350-10,530) people with HIV were estimated to be living in the four largest cities in the Netherlands, which amounts to 42% of the total number of people in the country with HIV. Of these 10,420 people, 370 (310-480) were estimated to be undiagnosed (27% of the national estimate of 1,390 individuals with an undiagnosed HIV infection). Of the four cities, Amsterdam had the largest population of people with HIV; an estimated 6,380 (6,350-6,440) individuals, of whom 140 (120-210) were still undiagnosed (*Table 1.5*). Of the 10,420 people with HIV in the four largest cities:

- 10,043 (96%) had been diagnosed and linked to care;
- 9,476 (92%, or 94% of those diagnosed) had started ART; and
- 9,106 (87%, or 96% of those on therapy) had a suppressed viral load.

All four cities had reached or were close to reaching the UNAIDS' 95-95-95 targets for 2025 with the current combined estimate for the cities standing at 96-94-96.

As shown in *Tables 1.5* and *1.6*, some of the regions have relatively small numbers of people with HIV. Estimates of the undiagnosed population are based on observed annual numbers of newly diagnosed HIV infections and on the CD4 count distribution at the time of diagnosis. With an increasingly smaller annual number of diagnoses, estimates become more sensitive to year-on-year fluctuations in newly diagnosed infections. As a result, the relative uncertainty in the estimates becomes larger. In this respect, it is reassuring that the total estimated number of 1,300 (95% CI 1,170-1,460) individuals living with undiagnosed HIV across the eight STI surveillance regions, is reasonably close to the number of 1,390 (1,210-1,710) we have estimated for the total nationwide population. Another source of uncertainty that is not quantified in the estimates, is that information on the region or city where people are living, is only recorded when people first enrol in care, or move to another HIV treatment centre. People moving in or out of a region or city without changing their HIV treatment centre, will not have their region of residence updated in the SHM records.

Table 1.6: Continuum of HIV care for the total population with HIV-1 in the Netherlands diagnosed and linked to care, stratified by the public health service region in which people were living at the end of 2022. Proportions are given relative to the number of people diagnosed and linked to care.

	Diagnosed and linked to care	Retained in care		Antiretroviral therapy		Viral suppression	
Public health service region	**n**	**n**	**%**	**n**	**%**	**n**	**%**
Noord							
Groningen	642	615	96	613	95	589	92
Fryslân	400	380	95	378	94	365	91
Drenthe	318	301	95	299	94	290	91
Oost							
IJsselland	398	389	98	386	97	373	94
Twente	468	454	97	449	96	436	93
Noord- en Oost-Gelderland	532	513	96	511	96	491	92
Gelderland Midden	789	762	97	760	96	722	92
Gelderland-Zuid	437	421	96	420	96	405	93
Utrecht							
Regio Utrecht	1,340	1,287	96	1,282	96	1,243	93
Noord-Holland/Flevoland							
Flevoland	603	566	94	559	93	530	88
Gooi & Vechtstreek	278	265	95	263	95	254	92
Hollands Noorden	480	447	93	444	92	425	88
Zaanstreek-Waterland	412	386	94	385	94	371	90
Amsterdam	6,547	6,215	95	6,190	95	5,954	91
Kennemerland	612	577	94	577	94	546	89
Zuid-Holland Noord							
Haaglanden	1,721	1,644	96	1,629	95	1,553	90
Zuid-Holland Zuid							
Hollands Midden	591	562	95	559	95	537	91
Rotterdam-Rijnmond	2,718	2,570	95	2,543	94	2,431	89
Dienst Gezondheid & Jeugd ZHZ	336	324	96	317	94	302	90
Zeeland/Brabant							
Zeeland	253	236	93	235	93	212	84
West-Brabant	602	586	97	583	97	566	94
Hart voor Brabant	901	859	95	856	95	835	93
Brabant-Zuidoost	731	679	93	676	92	648	89
Limburg							
Limburg-Noord	426	394	92	394	92	373	88
Zuid Limburg	594	556	94	556	94	535	90
Unknown	192	117	61	116	60	106	55
Total	**23,318**	**22,102**	**95**	**21,978**	**94**	**21,094**	**90**

Trans people

Geographical region of origin

Of the 30,598 individuals with an HIV-1 infection, 334 were trans people; 317 (95%) trans women and 17 (5%) trans men. In this group of 334 individuals, the most commonly-reported regions of origin were South America (125, 37%), the Caribbean (71, 21%), the Netherlands (63, 19%) and south and southeast Asia (33, 10%). Interestingly, many of the trans people originated from only a few specific countries. Among the 125 individuals from South America, there were 31 people from Ecuador, 25 from Brazil, 21 from Colombia, 15 from Suriname, and 14 from Venezuela. Most frequently reported countries of origin in the Caribbean were the former Netherlands Antilles (34) and Cuba (16), while 17 people from south and southeast Asia originated from Thailand.

In total, 92 trans people, or 34% of those born abroad, had a documented HIV-1 diagnosis before moving to the Netherlands. The majority (63) of these 92 people had already started ART before arrival. By the time these 63 people entered HIV care in the Netherlands, 46 (73%) had HIV RNA levels below 200 copies/ml, which was lower than in cis people of whom 83%, or 1,883 out of 2,270, had RNA levels below 200 copies/ml.

Diagnosis

In 2020-2022, 37 trans individuals were newly diagnosed with HIV while living in the Netherlands. These 37 people were relatively young, with a median age of 32 years (IQR 29-35) at the time of their HIV diagnosis, and most of them (30) were born abroad. Similar to MSM, the majority of the trans men and women, 49%, received their HIV diagnosis at a sexual health centre (*Figure 1.4*). Among the 37 trans individuals, 14 were diagnosed with a recent HIV infection, 14 with established, and 8 with late-stage HIV infection, which was comparable to the distribution across these stages among MSM; for 1 individual the stage of infection could not be determined. Trans individuals took somewhat longer to reach HIV care than other people, with 86% being in care within four weeks of diagnosis compared to 96% of other people diagnosed in 2020-2022.

Population in care

In total, 272 (81%) of the 334 trans individuals with HIV-1 were known to be in clinical care by the end of 2022. Of the 62 people who were not in care anymore, 14 had died, including four who died of AIDS and two individuals whose cause of death was recorded as suicide. Another 17 had moved abroad. The remainder were either lost to care (26), only moved to the Netherlands in 2023 (three), or only entered HIV care in 2023 (two). In total, 12 of the people who moved abroad and 18 of those lost to care had RNA levels below 200 copies/ml at their last viral load measurement.

Clinical condition

The majority of trans people in clinical care (266, or 98%), had started ART by the end of 2022. Of the 266 people in care with a viral load measurement in 2022, 251 (94%) had a last measurement in that year below 200 copies/ml; this proportion was 96% when considering individuals who had started therapy. The most recent CD4 count in 2020-2022 of those in care stood at a median of 730 (IQR 520-932) cells/mm^3, which was comparable to the CD4 counts in the total population in care.

HIV-2

In total, 101 of the 31,844 registered individuals with HIV acquired an HIV-2 infection (12 MSM, 34 other men, and 55 women); 13 of these were diagnosed in 2012 or later. HIV-2 is endemic in West Africa, and 65 people originated from this region, mostly from Ghana (25 people) or Cape Verde (24 people). Twenty-two individuals were born in the Netherlands.

Population in care

By the end of 2022, a total of 60 people were still in clinical care, 22 had died, seven had moved abroad, and 12 had no contact with HIV care during that year. The median age of those still in care was 63 years (IQR 56-67); 53 (88%) individuals were 50 years or older. The majority (90%) of those in care had been living with HIV-2 for more than 10 years, while 45% had been living with it for more than 20 years.

Clinical condition

Of the 60 people still in care, 48 had a most recent viral load measurement below 200 copies/ml, and 11 people had no available HIV-2 RNA result in 2022; there was one individual with a viral load above 200 copies/ml. Most people in care (42, 70%) had started ART. Of the 18 individuals who were still in care but had not started therapy, 13 had a viral load measurement below 200 copies/ml, while the other 5 people had no RNA measurement in 2022. CD4 counts in the group of 60 people in care were a median of 680 (IQR 527-868) cells/mm^3.

Conclusions

Since 2008 there has been a steady decrease in the annual number of new HIV diagnoses; in recent years, that figure has fallen below 500. However, this downward trend appeared to level off in 2022 with 393 (adjusted 461) new diagnoses, compared to 410 (adjusted 439) in 2021. The decrease in HIV diagnoses can, in part, be attributed to a fall in the estimated annual number of newly acquired HIV infections. However, as a result of disrupted testing services in 2020 and 2021 due to the (partial) lockdowns in response to COVID-19, the number of diagnoses in these years may be slightly lower than expected if we look at the long-term declining trend.

In 2022, 13% of the new HIV diagnoses among MSM and trans men and women were in people who reported prior use of PrEP. These people with prior use of PrEP accounted almost entirely for the rebound in the proportion of individuals diagnosed with a recent HIV infection compared with 2021.

Apart from the approximately 461 new HIV diagnoses in 2022, there were another 454 people born abroad who arrived in the Netherlands in 2022 and had a documented HIV-1 diagnosis prior to arrival. These 454 individuals included 185 (41%) people from Ukraine and represented an increase of 52% compared with the average number in 2018-2021. The majority of the migrants had already started antiretroviral therapy before arriving in the Netherlands and had a suppressed viral load.

A large proportion (48%) of newly diagnosed individuals already had late-stage HIV infection (i.e. CD4 counts below 350 cells/mm^3 or AIDS, and no evidence of a recent HIV infection) at the time of diagnosis. The downward trend in the proportion diagnosed with late-stage HIV has halted, and numbers appear to be increasing in the most recent years. This may, in part, be a consequence of increased efforts by healthcare professionals on HIV indicator condition-guided testing. The increase may also be a result of earlier diagnosis in other groups: the rapid diagnosis of people with early HIV infection, in combination with decreasing numbers of people newly acquiring an HIV infection, mean the undiagnosed population is mainly comprised of people who have been living with HIV for longer periods. That being the case, the observed proportion with late-stage HIV stems from a combination of underlying dynamics in transmission and diagnosis, and may be less suitable as an indicator of late-stage HIV. The absolute number diagnosed with late-stage HIV is more useful; this number is still steadily, albeit gradually, decreasing.

In recent years, almost all newly diagnosed individuals started ART within six months of diagnosis, irrespective of the stage of their HIV infection. This earlier therapy, combined with increased testing, earlier diagnosis, and a decreasing number of newly acquired HIV infections, has resulted in the Netherlands now being close to achieving the UNAIDS' 2025 targets of 95-95-95, with the current figures standing at 94-96-96[13].

Recommendations

The backlog in the collection of data on people with HIV (of whom SHM had been notified) was below the pre-specified maximum (one year) for all treatment centres. This was due, in part, to the implementation of an automated import of laboratory measurements (LabLink) into the SHM database. As a result, a reassessment of the continuum of HIV care for 2021 showed that the difference in the number of individuals in each stage was less than one percent, compared to the figures presented in last year's report. Nevertheless, in all stages of the care continuum the number of people was found to be greater than last year's reported figures, illustrating a delay in notifying SHM of people with HIV. Although the impact of delayed notification is expected to be small in terms of data on a national level, it may be more pronounced for regional or city-level data, where numbers are smaller. For that reason, it remains crucial that SHM is promptly notified of people with HIV in care.

One of the care continuum indicators that is not performing as well as some others, is the proportion of people who are still in care. In total, 1,160 individuals who were (1) diagnosed in or before 2022, (2) had received HIV care in the last ten years, and (3) had been registered with SHM, were recorded as lost to care (i.e. they did not visit their HIV physician or nurse in 2022, but they were not known to have died or moved abroad). The large proportion of people born abroad among those lost to care suggests that some may have left the Netherlands and are now receiving care in a different country. According to data from Statistics Netherlands, this appeared to be indeed the case, with 259 (22%) of the 1,160 having moved out of the country. Worryingly, 14% of people considered lost to care planned a transfer of care to another treatment centre but there was no confirmation that they did indeed register at a new centre. A procedure compliant with current privacy regulations has recently been implemented to follow-up on these individuals once they have arrived at their new centre. As a result, the proportion lost to care due to planned transfer of care should decrease in the coming years.

When compared with older age categories, HIV care continuum indicators were less favourable in young people between 15 and 24 years of age. One in five of those who were diagnosed and entered into HIV care had an unsuppressed viral load. On closer inspection, the largest gap in the cascade in *Figure 1.1B* appears to be the proportion with a suppressed viral load below 200 copies/ml among those who started ART. Improving viral suppression in these young individuals, thereby maintaining their health and preventing transmission of HIV, is one of the many steps on the road to zero new HIV infections.

The decrease in the number of new HIV diagnoses is likely, in part, to be the result of various positive developments mentioned earlier in this chapter. These include: earlier diagnosis; starting therapy sooner; a larger proportion of people with viral suppression; and a smaller number living with undiagnosed HIV. In the third quarter of 2019, pre-exposure prophylaxis (PrEP) became available on a national level for those at highest risk of acquiring HIV, which was an important extension of the available preventive measures. Although most people enrolled in the PrEP programme are adequately protected from acquiring HIV, some people drop out prematurely as illustrated by the considerable proportion of new diagnoses among MSM and trans men and women who reported prior use of PrEP. In order to more fully achieve a sustained and steeper reduction in the number of new HIV infections, access to PrEP care as well as care for individuals using PrEP needs to be further optimised.

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