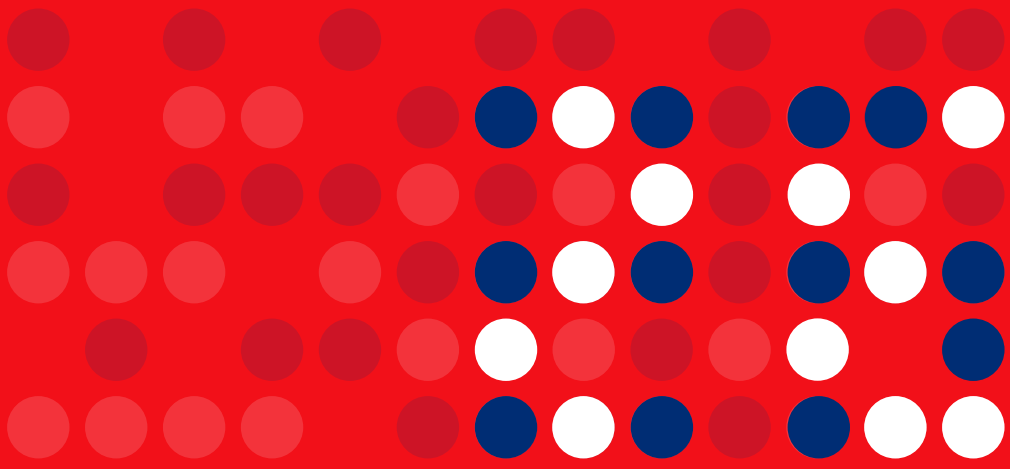
Human Immunodeficiency Virus (HIV)
Infection in the Netherlands

hiv Monitoring

HIV Monitoring Report 2026

Chapter 9: Children with HIV



9. Children with HIV

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***Box 9.1:** Chapter definitions.*

Children with HIV	A child diagnosed with HIV before the age of 15[1,2], whose first visit to a Dutch HIV treatment centre was before the age of 18 years.
Vertically-acquired HIV	Transmission during pregnancy, delivery, or breastfeeding
Non-vertically-acquired HIV	Included sexual transmission or exposure to contaminated blood or blood products.
Viral suppression	reported at thresholds of <200 and <50 copies/ml

***Box 9.2:** Cohort outline.*

Between 1998 and 2025, 511 individuals were diagnosed with HIV before age 15 and registered in the SHM database; 415 entered care in the Netherlands before age 18 and form the paediatric cohort described here. By 2025, 322 of these individuals (78% of the 415) were still in care.
Children in care in 2025 comprise:

- 129 individuals aged <18 years
- 193 individuals aged ≥18 years

Background

Antiretroviral therapy (ART) has markedly reduced morbidity and mortality in children with HIV worldwide[3-7]. Evidence demonstrating the benefits of early ART initiation led to a 2015 revision of the World Health Organization (WHO) guidelines on when to start ART; recommending ART for everyone with HIV (including children), regardless of CD4 cell count[8-12].

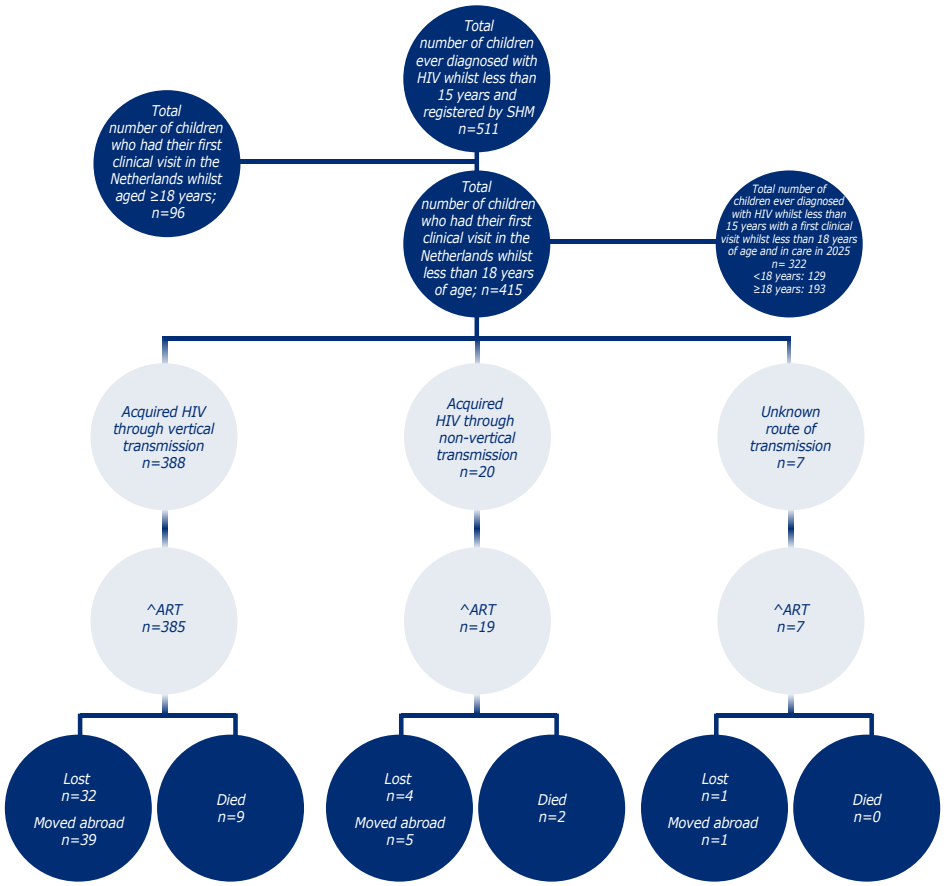
In the Netherlands children with HIV generally receive health care at one of four paediatric HIV treatment centres and transition to adult HIV care around the age of 18. Children diagnosed at older ages through non-vertical transmission more often enter care directly at adult HIV treatment centres. Those aged over 15 years when diagnosed are described as part of the adult population in *Chapter 1*.

This chapter summarises demographics, clinical characteristics, treatment and treatment outcomes between 2016-2025 for children diagnosed with HIV before the age of 15, and ever in care at a Dutch paediatric and/or adult HIV treatment centre before age 18 (*Box 9.2*). The age limit of 15 years aligns with the Joint United Nations Programme on HIV/AIDS (UNAIDS) and the World Health Organization (WHO) definitions of children [1, 2] .

Ever registered

As of December 2025, 511 individuals diagnosed with HIV before age 15 were registered in the SHM database (*Figure 9.1*). Of these, 415 children entered care in the Netherlands before age 18: the remaining 96 entered care after age 18, most of whom (85%) were born outside the Netherlands and 15% were born in the Netherlands. Those who were born in the Netherlands were diagnosed with HIV before 1996 and were already age 18 or older before the registration started. Among the 511 registered individuals, 415 met the inclusion criteria for description in this chapter.

Figure 9.1: *Overview of total population children with HIV registered in SHM database as of 31 December 2025.*



Legend: *^ of the total number of children who acquired HIV through a vertical, non-vertical or an unknown route of transmission. Legend: ART = antiretroviral therapy.*

Most children (97%) first attended paediatric care; only 12 first presented to an adult HIV treatment centre (median age of 17.1 years (IQR 16.3-17.5). Sub Saharan Africa was the most frequent region of origin (57%), followed by the Netherlands (27%) and other regions (16%). Detailed characteristics by transmission route are shown in *Table 9.1*.

Table 9.1: *Demographic and HIV-related characteristics of 415 children with HIV ever registered by SHM who were diagnosed before 15 years of age and entered care in the Netherlands below the age of 18.*

Characteristics	Total	Vertical transmission	Non-vertical transmission	Route of transmission unknown
Total N (%)	415	388 (93.5)	20 (4.8)	7 (1.7)
HIV treatment centre				
Paediatric care	403 (97.1)	380 (97.9)	16 (80.0)	7 (100.0)
Adult care	12 (2.9)	8 (2.1)	4 (20.0)	
Gender				
Female	211 (50.8)	197 (50.8)	12 (60.0)	2 (28.6)
Male	204 (49.2)	191 (49.2)	8 (40.0)	5 (71.4)
Child region of origin				
Sub-Saharan Africa	237 (57.1)	214 (55.2)	16 (80.0)	7 (100.0)
Netherlands	113 (27.2)	111 (28.6)	2 (10.0)	
Other/unknown	65 (15.7)	63 (16.2)	2 (10.0)	
Mother region of origin				
Sub-Saharan Africa	201 (48.4)	188 (48.5)	8 (40.0)	5 (71.4)
Other/unknown	179 (43.1)	167 (43.0)	10 (50.0)	2 (28.6)
Netherlands	35 (8.4)	33 (8.5)	2 (10.0)	
Adopted	155 (37.3)	153 (39.4)		2 (28.6)
Age at HIV diagnosis				
Median (IQR)	1.2 (0.2 to 4.2)	1.0 (0.2 to 3.5)	11.5 (7.4 to 14.3)	10.9 (10.2 to 11.7)
ART-treated	411 (99.0)	385 (99.2)	19 (95.0)	7 (100.0)
Therapy-naïve at ART initiation	360 (86.7)	337 (86.9)	16 (80.0)	7 (100.0)
CD4 at ART initiation				
Median (IQR)	540.0 (275.0 to 1152.0)	555.0 (279.8 to 1217.5)	323.5 (176.5 to 472.0)	475.0 (320.0 to 570.0)
CD4 Z-score at ART initiation				
Median (IQR)	-0.9 (-1.3 to -0.5)	-0.9 (-1.3 to -0.5)	-0.8 (-1.2 to -0.5)	-0.4 (-0.6 to -0.3)
VL (log copies/ml) at ART initiation				
Median (IQR)	5.1 (4.4 to 5.8)	5.2 (4.5 to 5.8)	4.3 (4.0 to 5.5)	4.9 (4.7 to 5.0)

Legend: **Data are number (%) of children or median (interquartile range). ART = antiretroviral therapy; VL = viral load.*

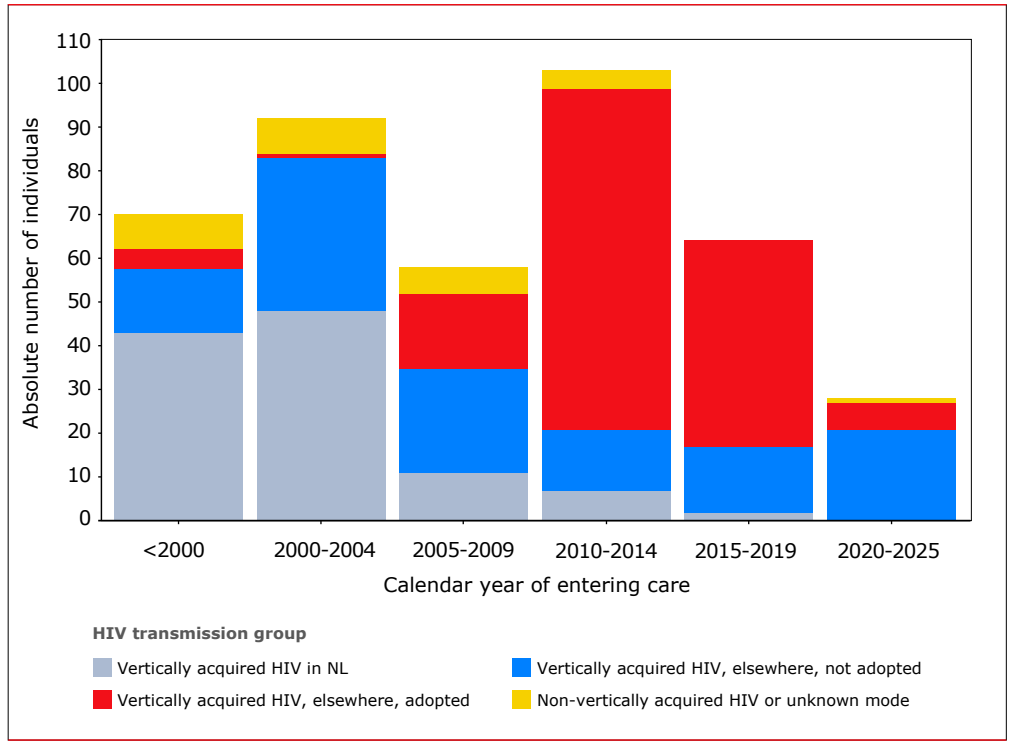
Mode of transmission

Vertical transmission

- Vertical transmission was the predominant mode of transmission, accounting for 94% of the children (n=388).
- Median age at first reported HIV-positive test result (including self-reported tests performed in the country of origin), was 1.0 years (interquartile range [IQR] 0.2-3.5 years).
- Nearly all children received care in a paediatric HIV treatment centre in the Netherlands.
- ART initiation was documented for 99% of the children.
- Just over half of the children were born in sub-Saharan Africa (55%), and 29% were born in the Netherlands.

Vertical transmission within the Netherlands has declined substantially following the introduction of the national standardized antenatal HIV screening in 2004[13, 14]. Vertical transmission in the Netherlands declined sharply from 2005 onwards and has become rare in the recent years (*Figure 9.2*), reflecting effective antenatal screening and treatment of pregnant women living with HIV.

*Figure 9.2: Number of children with HIV by year **of entering care** in the Netherlands, stratified by mode of HIV transmission and adoption status.*



Note: The numbers of children with non-vertically-acquired HIV or unknown mode of HIV transmission entering care were too small for stratification by mode of acquisition.

Non-vertical transmission

- Non-vertical transmission was rare: 20 children (5%) acquired HIV through heterosexual transmission or exposure to contaminated blood and blood products or medical procedures.
- Median age at diagnosis was 11.5 years (IQR 7.4-14.3). Among those with heterosexual transmission, median age at diagnosis was 14.7 years (IQR 13.8-14.9).
- Most of these children (95%) started ART.
- 80% were born in Sub-Saharan Africa.
- And 20% received care in an adult HIV treatment centre.

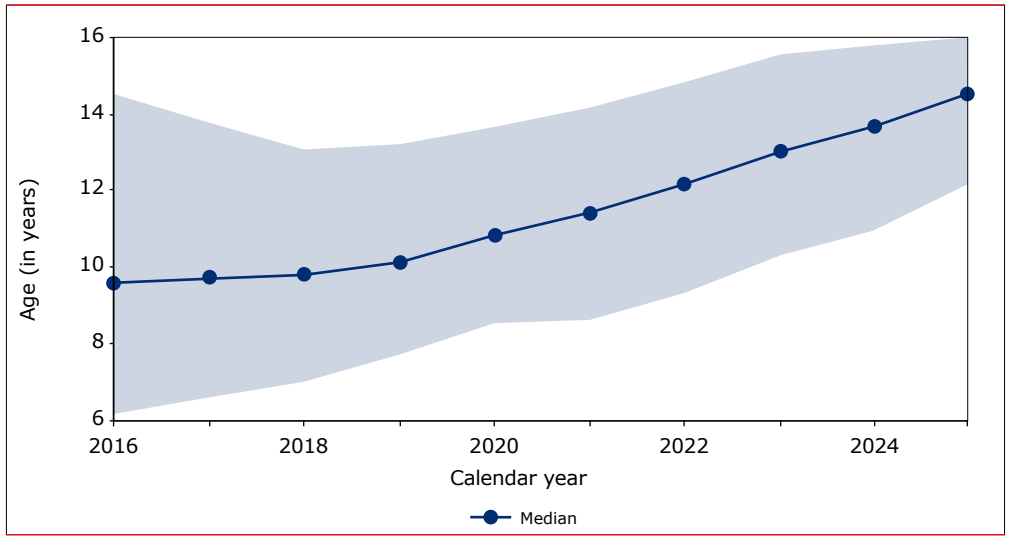
Unknown route of HIV transmission

- For 7 children with HIV, the route of transmission remains unknown (*Table 9.1*).
- Their median age at diagnosis was 10.9 years (IQR 10.2-11.7).
- All children had started ART.

Age distribution

Figure 9.3 shows the age distribution of children receiving HIV care in the last 10 years (2016-2025). The median age of children in HIV care in the Netherlands has increased steadily over the past decade, from 9.6 (IQR:6.1-14.5) years in 2016 to 14.6 (IQR:12.2-16.1) years in 2025. This increasing median age is a result of more children reaching the age of 18 years and, at the same time, fewer children are newly entering care (*Figure 9.2*).

Figure 9.3: *Time-dependent age distribution of children with HIV in care over time.*



Low mortality rates

Mortality in this cohort has been low. No child registered with SHM died before age 18 between 2016 and 2025. Since the start of registration, two deaths before age 18 have been recorded, both due to AIDS before 2010. However, between 2016 and 2025, 7 young adults diagnosed with HIV in childhood died at a median age of 26.8 years (IQR 24.9–29.8); 5 deaths were AIDS-related and two were due to non-AIDS related underlying cause of death, according to the Coding of Death format[15].

Antiretroviral treatment

Of the 415 children who entered care before age 18, 411 (99%) started ART. The majority (87%) were ART-naïve at initiation; 12% had prior exposure to mono- or dual therapy. Four children never received ART; all have left care, with last contact dates between 1998 and 2010.

For analyses of prescribed ART regimens and outcomes, children who initiated ART from 2016 onwards were included, irrespective of prior therapy. In this period, 54 children started ART (n=41 between 2016–2019:n=13 between 2020–2025).

Initial antiretroviral regimen

Among 54 children with documented ART initiation between 2016 and 2025:

- 52% started a protease inhibitor (PI).
- 24% started a non-nucleoside reverse transcriptase inhibitor (NNRTI).
- 24% started an integrase strand transfer inhibitor (INSTI) .
- INSTI-containing first regimens increased from 20% between 2016-2020 to 38% in the last 5 years, while PI containing first regimens decreased from 59% between 2016-2020 to 31% in the last 5 years.

Over half of these children (59%) were already on ART before entering care in the Netherlands; focusing on initial regimens started in the Netherlands (n=22):

- 45% started with a INSTI-containing regimen,
- 41% with an PI-containing regimen,
- 14% with an NNRTI-containing regimen.
- Since 2019, only INSTI-containing regimens were started in the Netherlands.

Ritonavir-boosted lopinavir was the most commonly used PI. Following the introduction of dolutegravir in 2014, INSTI-containing first-line regimens became more frequent: dolutegravir was used in 22% of children initiating ART in 2016–2025.

Discontinuation of the initial ART regimen

Of the 54 children initiating ART between 2016 and 2025, 49 (90%) discontinued their initial regimen. Median time on the first-line regimen was 16 months (IQR 1–39). Excluding weight-related dose adjustments, the main reasons for change were simplification (35%) and toxicity (10%).

Virological response

Virological response was assessed using viral load thresholds of 50 copies/ml and 200 copies/ml. Initial response was evaluated for the first two years after ART initiation between 2016–2025, and long-term response by time-updated age among children on ART for ≥24 months (*Figure 9.4*).

Initial response to ART

Data from 37 children initiating ART between 2016 and 2025 with available viral load measurements in the first 24 months were analysed. Children were grouped by age at ART initiation:

1. 0–2 years (n=18)
2. 2–18 years (n=19)

Viral suppression was assessed at 24-week intervals, using measurements closest to each time point (±8 weeks).

- Children aged 0–2 years at ART initiation
  - Suppression <50 copies/ml: 50% at 24 weeks, 92% at 2 years
- Children aged 2–18 years at ART initiation
  - Suppression <50 copies/ml: 69% at 24 weeks, 94% at 2 years.

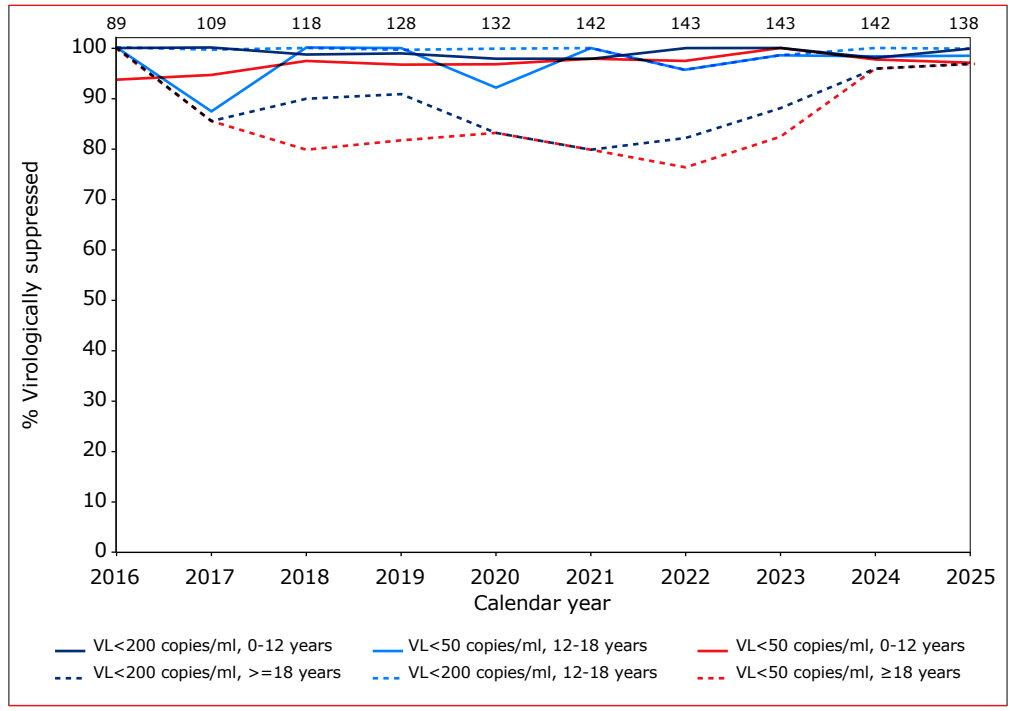
Long-term virological response

For children on ART for more than 24 months, the latest viral load measurement per calendar year was used to calculate annual suppression rates. Time-updated age was categorised as:

1. <12 years
2. 12–18 years
3. ≥18 years

Viral suppression rates remained high during childhood and adolescence but declined after age 18 (*Figure 9.4*). Given the small numbers in each calendar year, estimates for the oldest age group are more susceptible to variability.

Figure 9.4: Viral suppression following antiretroviral therapy (ART) initiation: Time-dependent and age-dependent viral suppression rates for children in care between 2016 and 2025 with at least two years with ART. Viral suppression is defined as any viral load measurement below 50 copies/ml, except for time points in the past where tests were used with quantification limits above 50 copies/ml. The numbers above the lines represent the total number of individuals with an viral load measurement.



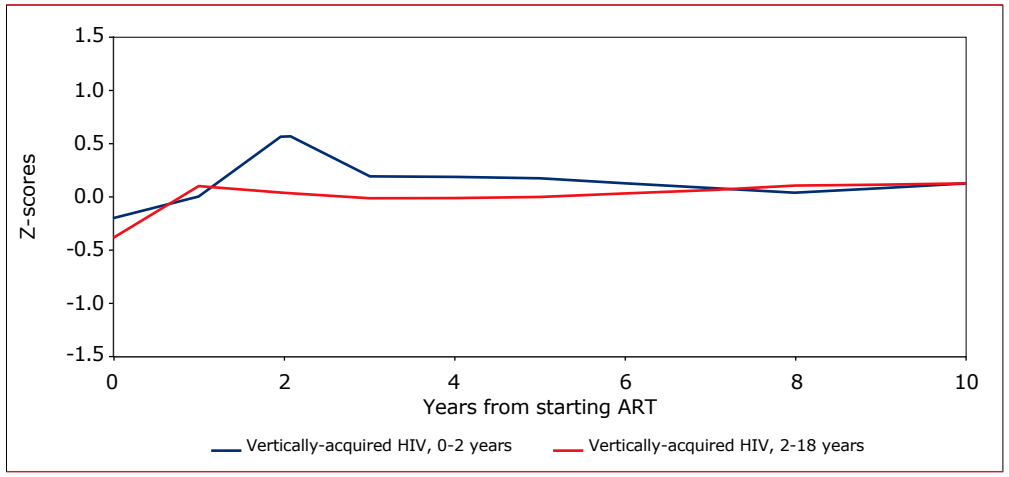
Legend: VL = viral load.

Immunological response

Clinical benefit of ART is closely linked to CD4 cell recovery[16]. Because normal CD4 counts vary strongly with age, CD4 trajectories were analysed using age-standardised Z-scores based on reference values from HIV-negative children[17,18]. A Z-score of zero represents the age-appropriate median. A CD4 Z-score of minus 1 indicates that a child's CD4 cell count is 1 standard deviation below the age-specific median of the HIV-negative population.

Figure 9.5 shows CD4 Z-score changes among children with vertically acquired HIV who initiated ART between 2016 and 2025, stratified by age at ART initiation (0–2 years vs 2–18 years). In both age groups, CD4 Z-scores increased during the first year after initiation. In the second year, the increase was less pronounced in children who started ART at ages 2–18 years.

Figure 9.5: *Changes in Z-scores for CD4 cell counts among children with HIV, stratified by age at initiation of antiretroviral therapy (ART), who initiated ART between 2016 and 2025.*



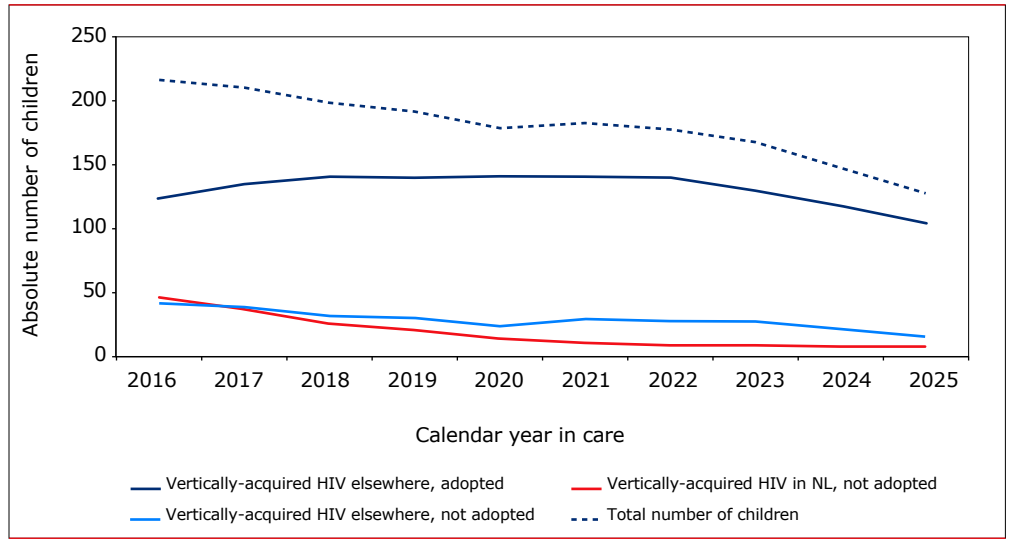
Blue: *age at ART initiation 0–2 years;* ***Red:*** *age at ART initiation 2–18 years;*
Legend: *ART = antiretroviral therapy.*

Currently in clinical care (as of 31 December 2025)

Of the 415 children ever registered who entered care before age 18, 322 (78%) were still in care in 2025, and 93 (22%) were no longer in care. Among the 93 no longer in care: 11 had died, 45 had moved abroad, 37 were lost to care.

Of the 322 individuals still in care, 129 were younger than 18 years (*Figure 9.1*). The number of children under 18 was 218 in 2016 and declined to 149 in 2024 and 129 in 2025, primarily because more children reached adulthood and fewer new cases entered paediatric care (*Figure 9.6*).

Figure 9.6: *Number of children aged <18 years known to be in care at the end of each calendar year shown by mode of HIV transmission and adoption status. Note: Children with non-vertically-acquired HIV are not reported as a separate category due to their small numbers, but they are included in the total number of children in care.*



Currently in care and under 18 years of age

- 129 were <18 years, of whom 74 were <15 years
- Median age: 14.6 years (IQR 12.2-16.1)

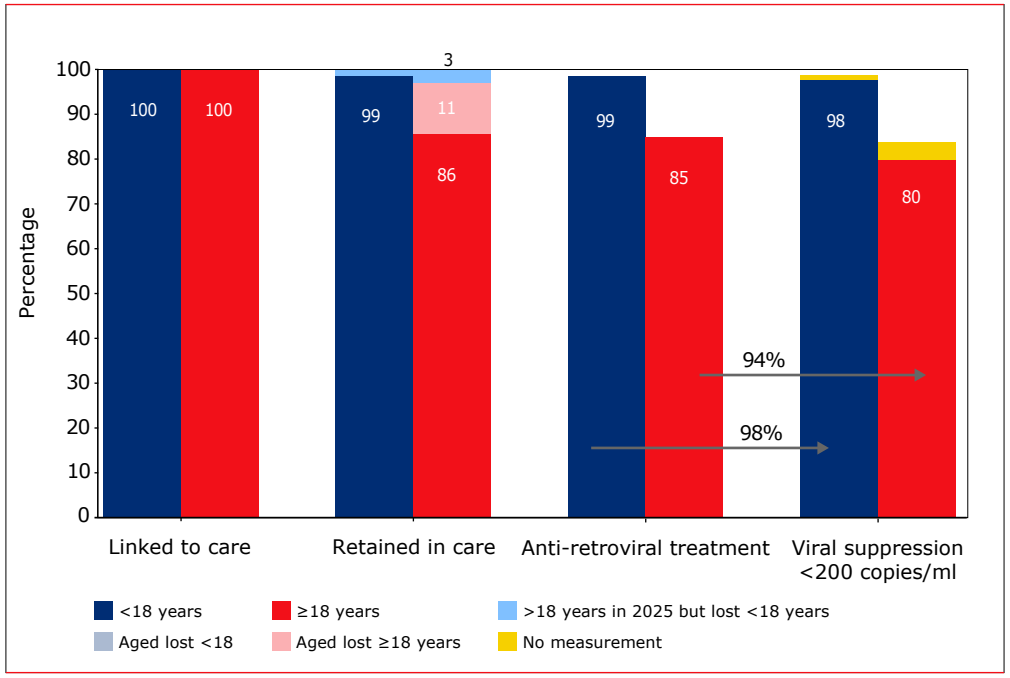
Currently in clinical care and 18 years or older

- 193 were ≥18 years at the end of 2025
- Median age: 26.6 years (IQR 21.9-31.2)

Continuum of care

A continuum of care was constructed for all children ever registered by SHM who were still alive in 2025 and not reported to have moved abroad. Individuals were stratified by current age (<18 vs ≥18 years), and steps included linkage to care, retention, ART use, and viral suppression <200 copies/ml (*Figure 9.7*).

Figure 9.7: *Continuum of care by age, as of 31 December 2025. The numbers in and above the bars indicate the proportion of individuals.*



Continuum of care: current age under 18 years

- 130 children were linked to care
- 129 (99%) were retained in care; one was lost to care
- All children in care were on ART at their last clinical visit in 2025
- 127 (98%) of all children had a most recent HIV RNA measurement <200 c/ml

Continuum of care: current age 18 years or older

- 224 individuals were linked to care
- 193 (86%) were retained in care; 31 were lost to care (21 born outside the Netherlands). Six were lost before age 18, and 25 after age 18
- 191 (85%) were on ART at their last clinical visit in 2025
- 179 (80%) of all individuals had a most recent HIV RNA measurement <200 c/ml (94% among those on ART)

Ten of the 31 young adults lost to care had their last clinical contact at a paediatric centre and may have been lost during transition to adult care or awaiting registration at an adult centre.

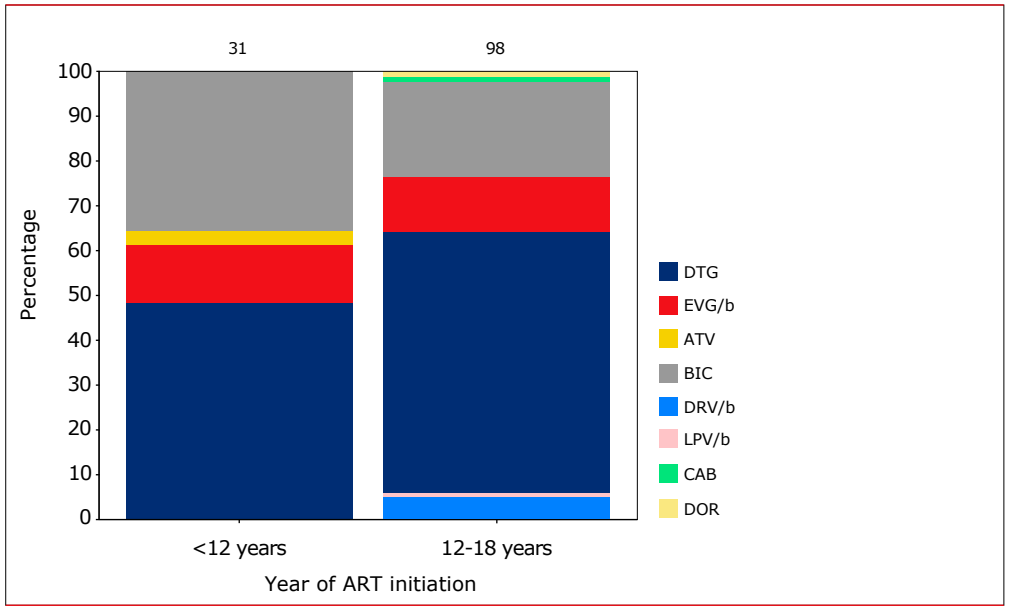
In care and on ART in 2025

Of the 129 children in care and <18 years in 2025, all were on ART at their last visit. The current regimen composition by age was:

- Children <12 years
  - All except one child used INSTI-based regimens
  - Dolutegravir (48%) and bictegravir (35%) were the most common third agents
- Children 12–18 years
  - 93% used INSTI-based regimens
  - 6% were on PI-based regimens

Among INSTI-based regimens, dolutegravir was most common (58%), followed by bictegravir (21%) and elvitegravir (12%).

*,**Figure 9.8:** Third-drug additions to the nucleoside reverse transcriptase backbone used as part of the current regimen, stratified by current age. Numbers above the bars represent the total number of individuals initiating ART in that particular calendar year period.*



***Legend:** DRV/b = cobicistat/ritonavir-boosted darunavir; LPV/b = ritonavir-boosted lopinavir; DTG = dolutegravir; EVG/b = cobicistat-boosted elvitegravir; ATV = atazanavir; BIC = bictegravir.*

SPECIAL POPULATIONS

Adopted children

Among the 415 children ever registered who entered care before age 18, 155 (37%) were adopted by Dutch parents. The number of adopted children among newly registered cases increased from less than five before 2000 to 78 children in 2010–2014, 47 children in 2015–2019, and declined to 6 children in 2020–2025 (*Figure 9.2*). Median age at entry into care for adopted children was 2.7 years (IQR 1.5–4.7).

- 72% (112/155) were already on ART before entering care in the Netherlands
- 11% (17/155) had received mono- or dual therapy prior to ART
- All adopted children received ART during care in the Netherlands

As of 31 December 2025, 142 adopted children were alive and in care; 105 were <18 years (median age 15.3 years, IQR 13.0–18.1)(*Figure 9.6*). Thirteen adopted children were no longer in care, because they were lost to follow-up, moved abroad, or died after the age of 18 years. All adopted children still in care in 2025 were on ART, and all but one had HIV RNA <200 copies/mL; 98% had HIV RNA <50 copies/mL.

Transfer to adult care

By 31 December 2025, 218 of the 415 children had reached the age of 18 years or older and transferred from paediatric to adult care. Their follow-up status is summarised in *Figure 9.9*:

- 178 (82%) remained in care in 2025
- 7 (3%) moved abroad
- 8 (4%) were deregistered at paediatric centres but not yet registered at adult centres (possibly administrative delay or loss during transition)
- 18 (8%) were lost to care
- 7 (3%) had died

Median age at last paediatric visit was 18.1 years (IQR 17.7–18.7). The median interval between the last paediatric visit and first visit in an adult HIV treatment center was 4 months (IQR 3–6), and median time in adult care until last documented visit was 8 years (IQR 5–12).

At the last paediatric visit:

- 26 adolescents (12%) had HIV RNA >200 copies/mL (median 4135 copies/mL, IQR 1115–47072)
- 41 adolescents (19%) had HIV RNA >50 copies/mL

However, the proportion with detectable HIV RNA decreased over calendar time: among those transferring in or after 2015, detectable HIV RNA was less frequent than in those transferring earlier (from 20% to 6% for >200 copies/mL, and from 31% to 10% for >50 copies/mL; *Figure 9.10A*).

During the last paediatric visit, 91% of adolescents were on ART, 2% had never started ART, and 7% had discontinued ART. Before 2015, adolescents were more often not on ART at transition compared with transitions in or after 2015 (19% vs 2%; *Figure 9.10B*).

ART regimen shifted over time:

- Adolescents transferring before 2015 were most commonly on NNRTI-based (30%) or PI-based regimens (33%).
- Among those transferring in or after 2015, 61% used INSTI-based regimens, 18% NNRTI-based, and 21% PI-based regimens.
- Of the 218 adolescents who transferred, 87 had a treatment change within 2 years after transfer, 10 of whom were not using treatment at the time of transfer. The most common change was a switch to an INSTI-based regimen (32%).

Of the 178 adolescents who transferred and remained in care by 2025, 168 (94%) were on ART; 72% used INSTI-based regimens. In 2025, 92% had HIV RNA <200 copies/mL and 90% had HIV RNA <50 copies/ml.

Figure 9.9: *Follow up status, as of 31 December 2025, of children who transferred to adult care.*

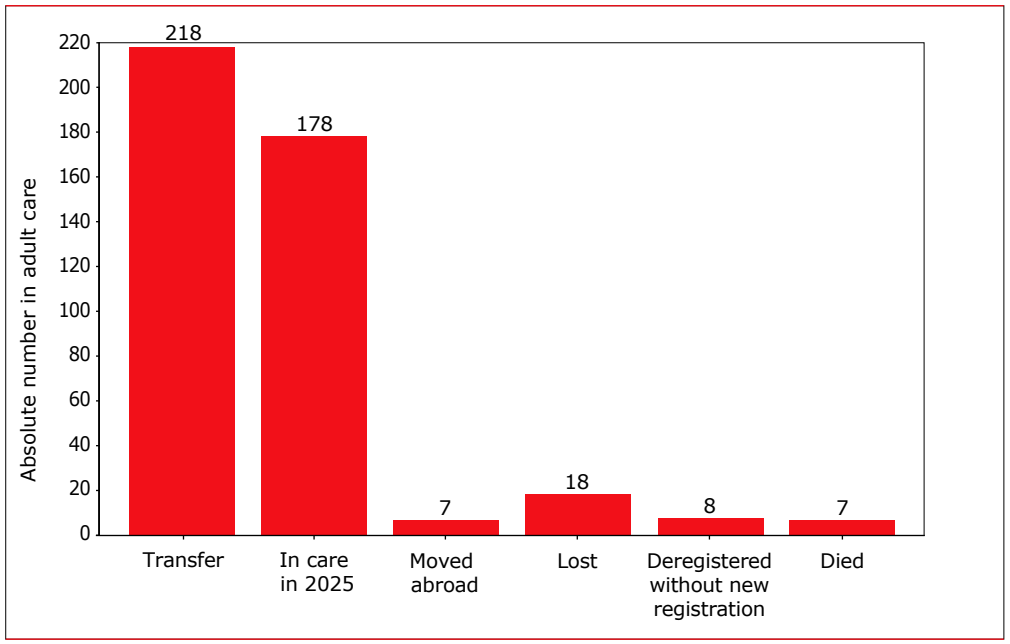
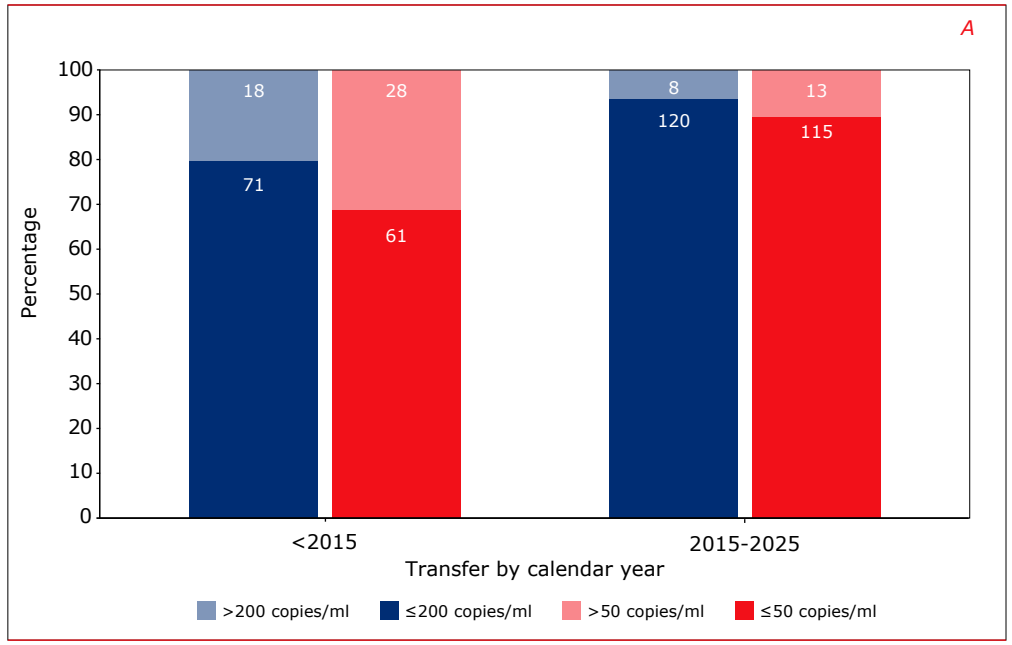
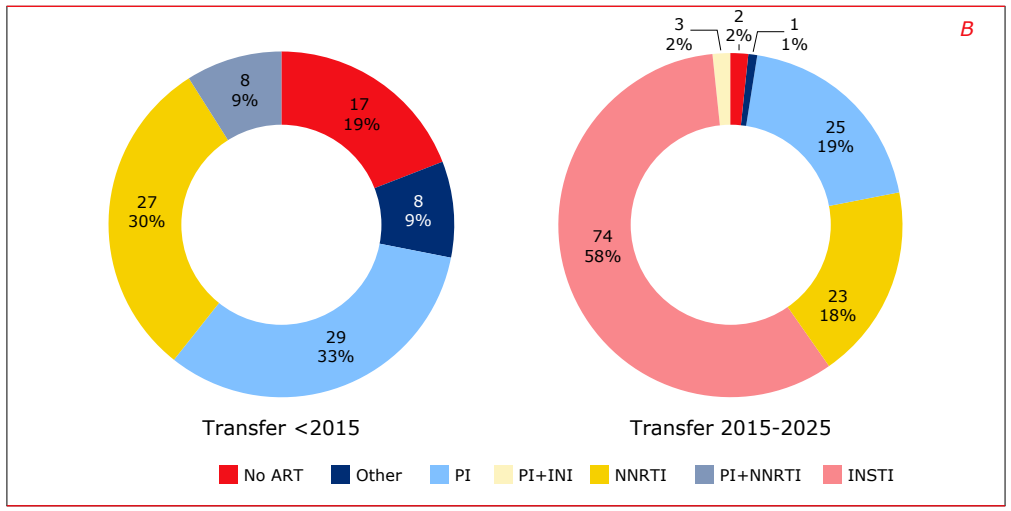


Figure 9.10: *HIV RNA (A) and ART regimens (B) at last visit in paediatric care of children who transferred to adult care, stratified by calendar year of transfer.*





Summary

Of the 415 children ever registered by SHM who entered care before age 18, 78% remained in care in 2025. Clinical outcomes have been favourable: no deaths occurred among children under 18 years over the past decade. Nearly all children (99%) received ART. The use of INSTI-containing regimens increased over time, and have largely replaced PI- and NNRTI-based regimens.
The number of children in paediatric care is declining due to effective prevention of mother-to-child transmission and a reduction in the number of adopted children, combined with an increasing proportion of this cohort reaching adulthood and transitioning to adult care. This transition is associated with lower rates of viral suppression and reduced retention in care compared with paediatric follow-up, indicating that adolescents and young adults require special attention.

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