HIV/AIDS in Austria

2025 Annual Report of the HIV Cohort Study on HIV/AIDS in Austria

Innsbruck, November 30th, 2025

HIV / AIDS
in Austria

2025 Annual Report of the HIV Cohort Study on HIV/AIDS in Austria

Edited by Robert Zangerle, MD
Professor of Dermatovenerology and Infectious Diseases
Medical University of Innsbruck
Innsbruck, Austria

Authors:
Maria Kitchen
Gisela Leierer
Michaela Rappold
Stefanie Strickner
Robert Zangerle

e-mail: lki.ha.hiv-kohorte@tirol-kliniken.at

1 Introduction

At the end of the year 2001, representatives of 5 Austrian HIV treatment centres (AKH Vienna, Penzing Hospital Vienna, Kepler Universitätsklinikum Med Campus III Linz, LKH Innsbruck and LKH Graz II West) have founded the **„Austrian HIV Cohort Study (AHIVCOS)"**. In 2008, two more centres (LKH Salzburg and LKH Klagenfurt), in 2016 Favoriten Hospital Vienna and in 2018 LKH Feldkirch joined the AHIVCOS. The responsibility for the medical and scientific coordination lies with Robert Zangerle from the Medical University of Innsbruck.

Aims of Austrian cohort study are:

1) Optimization of patient management
2) HIV surveillance
3) Research projects

A special software, the *"HIV Patient Management System (HIP)"* is used in all centres and has replaced the previous *HIV data base* in 2005. The input of data is (was) done peripherally in the HIV treatment centres which consistently use the data base for clinical care. The input of laboratory findings is mostly done electronically. Apart from nurses and doctors, additional professional groups are involved in data entry in some centres (social workers, psychologists). Before data can be merged, the cohort participants are made anonymous. Therefore, it is cumbersome to identify cohort participants who are/were treated in more than just one treatment centre. This cannot be done by the use of personal data such as initials, birthday or postal code, but with HIV specific data (date of the HIV test, CD4 cell counts etc.).

***HIV Patient Management System*:**

Designed as a client-server application, the *HIP* stores its data in a persistent SQL database. The software is based on the model driven architecture paradigm and has been implemented with Microsoft .NET technology. The company DI Heinz Appoyer (now called *network vita*) was entrusted with the development of the *HIP*. The required hardware is provided by the local IT departments in the centres. In terms of data protection the programme fully complies with the Austrian data protection act (DSG 2000, valid since 1.1.2000). Access to the data base in the centres is restricted to authorized users only.

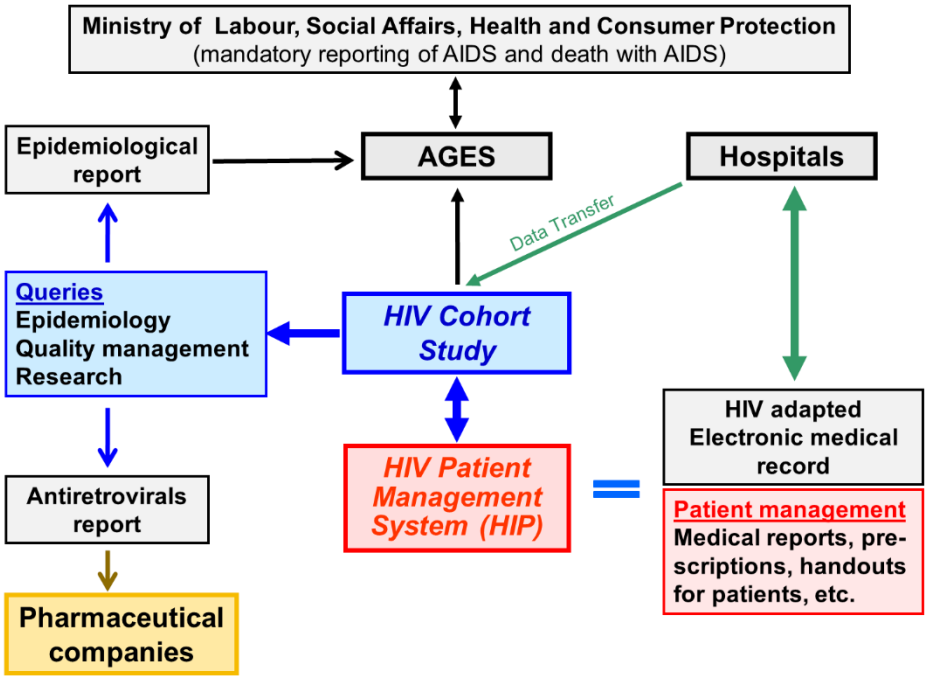
On the one hand, the *HIP* fulfils complex tasks for the clinical management of HIV infected patients, and on the other hand it allows queries and analyses to be performed by the users without restrictions. However, to allow both individual patient management and scientific queries is an enormous challenge which scientific HIV cohorts in other countries have not had to deal with. In Austria, there was no acceptance for a purely scientific data base. While for the clinical patient management the focus is on readability of diagnoses and therapies, creation of medical reports, prescriptions (trade names!), print-out of results etc., scientific queries need precise coding and categorization. Furthermore, the optimization of individual patient management requires an ongoing adjustment to the progress of information technology, whereas purely scientific data bases do not have such technological renewal pressure.

Special challenges for the *HIV Patient Management System* are:

- Checking of plausibility of the data after entry in the database
- Meeting the requirements of both clinical patient management and scientific database
- Weak/ overburdened infrastructure in HIV treatment centres

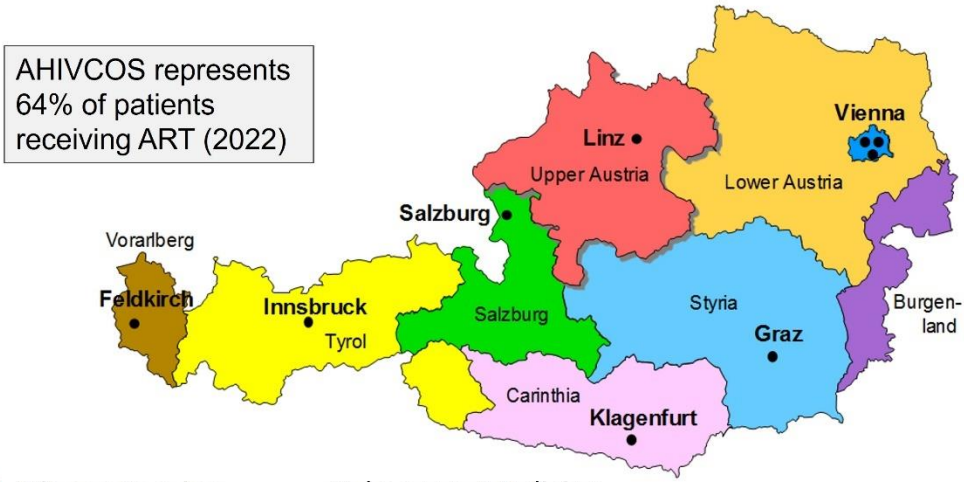
2 Organization of the Austrian HIV cohort study

The organization and further development of the HIV cohort study will stay complex, because some goals of the *Austrian HIV Cohort Study* are also of interest to health authorities and/ or institutions. The Federal Ministry of Social Affairs, Health, Care and Consumer Protection (BMSGPK, Department VII/A/11, Dr.in Sigrid Kiermayr) is in charge of HIV, whereas some agenda of this responsibility has been shifted to the Agency for Health and Food Safety (AGES). In contrast, patient care has to be provided by the different federal states, and the social insurance companies bear the costs of the HIV medication. The IT departments in the hospitals have to provide the IT hardware as well as the service/ data security. Because of the support of BMSGPK and AGES, the collaboration between the *Austrian HIV Cohort Study* and the hospitals, especially with the local IT departments (e. g. interfaces between HIP and local IT systems) is legitimized. For IT departments, HIP as an "isolated application" is seen as an additional liability. On the other hand, hospitals have also an interest in the *HIV Patient Management System* because tasks of quality management and standardization of care can be managed more efficiently by using HIP. The establishment of the *HIV Patient Management System* is a big advance in the management of patients with HIV/AIDS („Good Chronic Disease Practice").



The development of the *HIV Patient Management System* incorporated the international standard format, the HIV Cohorts Data Exchange Protocol (HICDEP), so that data merging with networks of cohorts like ART-CC, EuroSIDA and RESPOND are greatly facilitated.

Centres of the Austrian HIV Cohort Study



Vienna Penzing	Pulmonary Medicine
Vienna AKH	Dermatovenereology
Vienna Favoriten	Infectious Diseases
Graz	Infectious Diseases
Linz	Dermatovenereology
Salzburg	Oncology/Infectious Diseases
Klagenfurt	Oncology
Innsbruck	Dermatovenereology
Feldkirch	Oncology/Infectious Diseases

3 Funding

The Austrian HIV Cohort Study (AHIVCOS) is supported by the public health sector (AGES, by order of the Federal Ministry of Health), the participating hospitals (routine maintenance of the *HIV Patient Management System ("HIP"),* the partners in the pharmaceutical industry (all relevant companies providing HIV drugs – GILEAD, GSK & ViiV and MSD) and international cohort collaboration RESPOND, which provides the largest single financial contribution.

4 Cohort participants

4.1 Definition of Cohort participants

The Austrian HIV Cohort Study has gained approval of the ethical committees of the HIV treatment centres. With this the Austrian HIV Cohort Study has been ready to join the international network of cohorts like ART-CC, CASCADE, COHERE and RESPOND.

Inclusion criteria:

- Patients living with HIV infection

Exclusion criteria:

- Physician's decision
- Patient withholds consent

Frequency of the monitoring („Follow-up"):
Cohort participants will be examined and findings/ results documented at regular visits (at least semianually), therefore no additional costs will arise.

Minimal dataset:

- Last negative, first positive HIV test, seroconversion illness, AIDS diagnoses, all cases of death
- First contact with the HIV centre
- Age, sex, mode of transmission of HIV
- CD4 count, HIV RNA, co-infections and co-morbidities
- Resistances to antiretroviral drugs
- Antiretroviral therapies (past and present)
- Co-morbidities
- Co-medication

Merger of data:

- Only indirectly personal data according to the data protection act
- Semiannual (March and September)

4.2 Recruitment and follow-up of cohort participants

So far, 11772 HIV infected patients providing 140423.29 years of follow-up have been recruited into the cohort study. We assume that there were more than 3051 deaths, but data entry from patients with loss of follow-up or last contact a long time ago is incomplete. Most centres do not have enough resources to enter data retrospectively.

Cumulative number of all cohort participants

	Penzing Vienna	AKH Vienna	Favoriten Vienna	Linz	Salz-burg	Inns-bruck	Feld-kirch	Graz	Klagen-furt	Total
01.09.2025	2842	3539	358	1359	628	1579	192	908	367	**11722**

	Last contact with HIV treatment centre and alive or not known to be dead			
	Follow-up within the last 12 months	Living/moved to care abroad	Lost to follow-up	**Total**
Penzing Vienna	809	100	722	**1631**
AKH Vienna	1410	432	990	**2832**
Favoriten Vienna	239	15	87	**341**
Linz	722	73	143	**938**
Salzburg	358	81	131	**570**
Innsbruck	756	279	99	**1134**
Feldkirch	150	20	13	**183**
Graz	506	63	196	**765**
Klagenfurt	267	11	49	**327**
Total	**5217**	**1074**	**2430**	**8721**

	Death		
	Death within the last 12 months	Death since more than 12 months	**Total**
Penzing Vienna	8	1203	**1211**
AKH Vienna	11	696	**707**
Favoriten Vienna	2	15	**17**
Linz	7	414	**421**
Salzburg	4	54	**58**
Innsbruck	9	436	**445**
Feldkirch	0	9	**9**
Graz	4	139	**143**
Klagenfurt	2	38	**40**
Total	**47**	**3004**	**3051**

Risk factors for no follow-up within the last 12 months

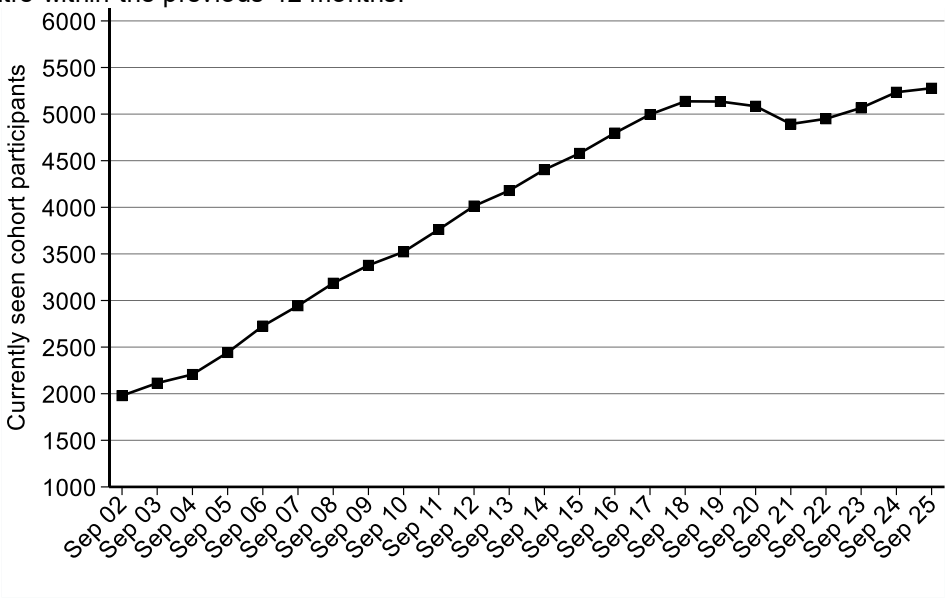
Persons with residency abroad were excluded from this analysis.

All centres	Frequencies		%	Univariable logistic Regression			Multivariable logistic Regression		
Variable	2430	7647	31.78%	**OR**	**(95%CI)**	**p-value**	**OR**	**(95%CI)**	**p-value**
Demographic characteristics									
Age at last contact									
< 30	414	607	68.20%	10.84	[8.92,13.18]	<0.001	9.74	[7.89,12.01]	<0.001
30-50	1495	3885	38.48%	3.16	[2.82,3.54]	<0.001	2.92	[2.58,3.30]	<0.001
> 50	521	3155	16.51%	1.00		.	1.00		.
HIV transmission category									
Male IDU	266	664	40.06%	1.32	[1.11,1.57]	0.001	1.20	[1.00,1.45]	0.053
Female IDU	110	297	37.04%	1.16	[0.91,1.49]	0.227	1.10	[0.84,1.45]	0.468
Male hetero	321	1271	25.26%	0.67	[0.58,0.77]	<0.001	0.84	[0.71,0.99]	0.042
Female hetero	352	1400	25.14%	0.66	[0.58,0.76]	<0.001	0.70	[0.60,0.83]	<0.001
Other	211	531	39.74%	1.30	[1.08,1.57]	0.006	1.11	[0.89,1.38]	0.339
MSM	1170	3484	33.58%	1.00		.	1.00		.
Population size of residence area									
Vienna	1544	3442	44.86%	3.21	[2.90,3.55]	<0.001	3.06	[2.75,3.41]	<0.001
Missing	47	54	87.04%	26.51	[11.94,58.85]	<0.001	14.19	[6.10,32.98]	<0.001
Outside Vienna	839	4151	20.21%	1.00		.	1.00		.
Nationality									
High prevalence	264	693	38.10%	1.39	[1.18,1.64]	<0.001	1.32	[1.08,1.61]	0.006
Low prevalence	521	1702	30.61%	1.00	[0.89,1.13]	0.998	0.75	[0.66,0.85]	<0.001
Missing	69	104	66.35%	4.47	[2.96,6.74]	<0.001	2.51	[1.56,4.05]	<0.001
Austria	1576	5148	30.61%	1.00		.	1.00		.
Stage of disease									
AIDS									
Yes	379	1549	24.47%	0.64	[0.56,0.73]	<0.001	0.83	[0.72,0.95]	0.008
No	2051	6098	33.63%	1.00		.	1.00		.

4.3 Patients currently in care

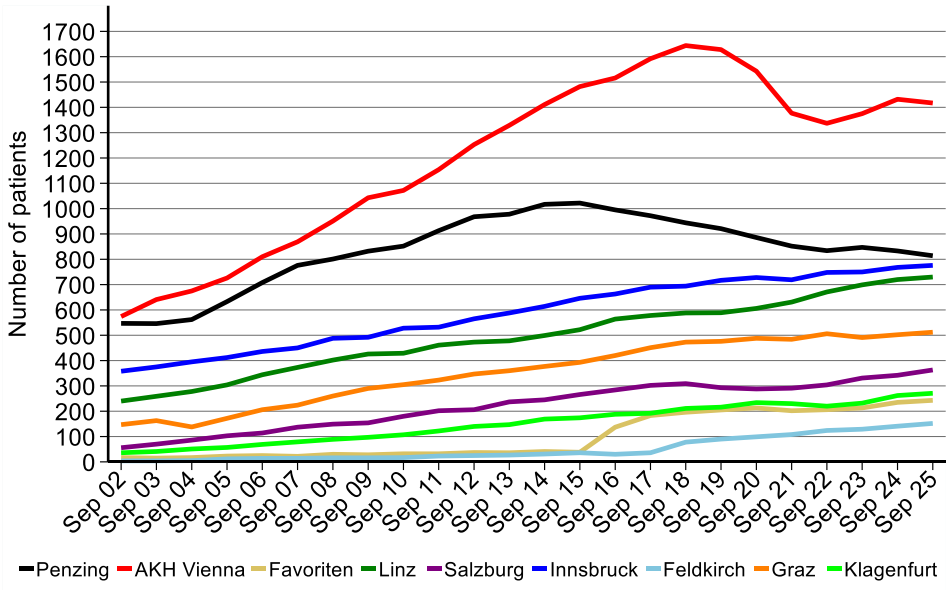
4.3.1 Overall (12 months)

Patients were seen as currently in care when they had at least one contact to an HIV centre within the previous 12 months.



Number of patients currently in care

	Penzing Vienna	AKH Vienna	Favoriten Vienna	Linz	Salz-burg	Inns-bruck	Feld-kirch	Graz	Klagen-furt	Total
01.09.2025	814	1417	243	730	363	776	152	512	271	**5278**

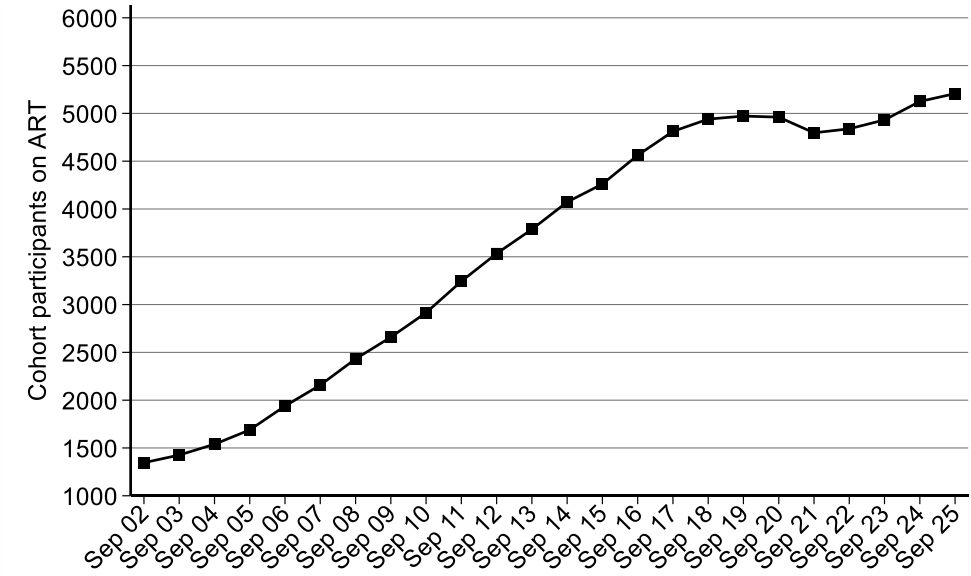


Number of currently seen patients by residence

	HIV-centre									
	Penzing Vienna	AKH Vienna	Favoriten Vienna	Linz	Salz-burg	Inns-bruck	Feld-kirch	Graz	Klagen-furt	**Total**
Burgenland	21	39	6	0	0	3	0	23	0	**92**
Carinthia	0	1	0	3	6	8	0	13	262	**293**
Lower Austria	185	282	24	50	1	3	0	4	0	**549**
Upper Austria	2	6	0	655	38	2	0	1	0	**704**
Salzburg	0	1	1	4	267	30	0	1	0	**304**
Styria	2	10	2	5	9	3	0	463	4	**498**
Tyrol	0	0	0	1	3	601	0	1	0	**606**
Vorarlberg	0	0	0	1	0	104	150	0	0	**255**
Vienna	603	1073	205	8	3	7	0	4	2	**1905**
Foreign/missing	1	5	5	3	36	15	2	2	3	**72**
Total	**814**	**1417**	**243**	**730**	**363**	**776**	**152**	**512**	**271**	**5278**

4.3.2 Number of patients currently on antiretroviral therapy

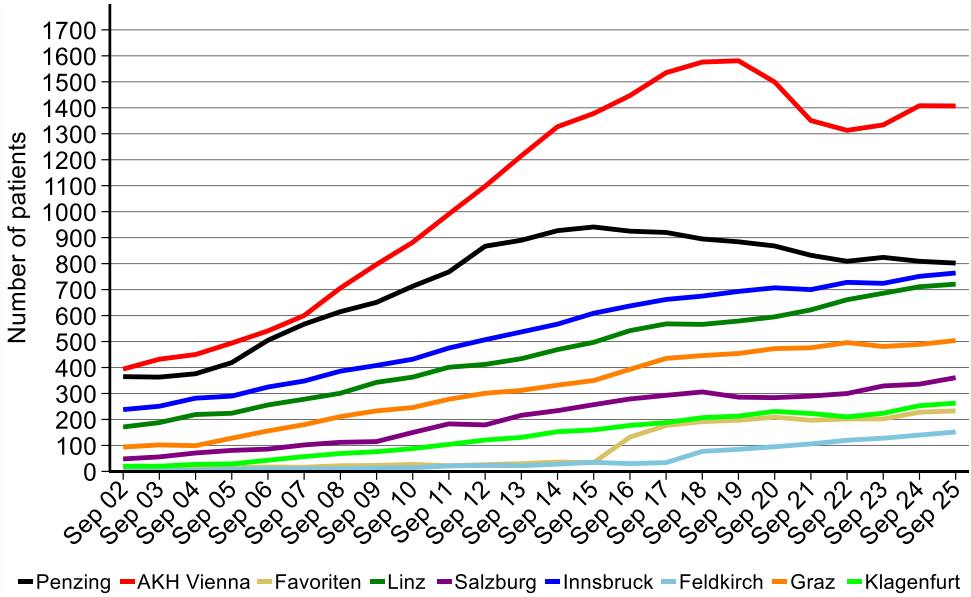
5207 patients (98.7%) were on antiretroviral therapy in the 9 HIV treatment centres. Of the 71 patients not on treatment 41 had received antiretroviral treatment at an earlier point in time (women who were on ART to prevent mother-to-child transmission, patients who received transient ART during/ after the acute HIV infection, etc.).



,

Number of participants currently on antiretroviral therapy

	Penzing Vienna	AKH Vienna	Favoriten Vienna	Linz	Salz-burg	Inns-bruck	Feld-kirch	Graz	Klagen-furt	Total
01.09.2025	802	1407	233	721	361	764	152	504	263	**5207**



Number of participants currently on antiretroviral therapy by area of residence

	HIV-centre									
	Penzing Vienna	AKH Vienna	Favoriten Vienna	Linz	Salz-burg	Inns-bruck	Feld-kirch	Graz	Klagen-furt	**Total**
Burgenland	21	39	5	0	0	3	0	23	0	**91**
Carinthia	0	1	0	3	6	8	0	13	255	**286**
Lower Austria	184	279	23	48	1	3	0	4	0	**542**
Upper Austria	2	6	0	648	37	2	0	1	0	**696**
Salzburg	0	1	1	4	266	29	0	1	0	**302**
Styria	2	10	2	5	9	3	0	455	3	**489**
Tyrol	0	0	0	1	3	591	0	1	0	**596**
Vorarlberg	0	0	0	1	0	103	150	0	0	**254**
Vienna	592	1066	199	8	3	7	0	4	2	**1881**
Foreign/missing	1	5	3	3	36	15	2	2	3	**70**
Total	**802**	**1407**	**233**	**721**	**361**	**764**	**152**	**504**	**263**	**5207**

4.3.3 How many persons living with HIV (PLHIV) are there in Austria?

Data from AHIVCOS were used to derive the four-stage continuum of HIV care using the ECDC modelling tool and to estimate HIV incidence and the proportion of undiagnosed cases for the years 2010 to 2024.

a. People living with HIV (PLHIV).
b. Proportion of cases ever diagnosed.
c. Proportion of ever diagnosed individuals who have ever started ART
d. Proportion of those who have achieved viral suppression (≤200 c/ml)
e. Proportion of suppressed individuals among all PLHIV

For high estimates, patients lost to follow-up (LTFU, no contact 1.5 years before the end of the respective year) were excluded; for low estimates, they were included, and missing HIV RNA was considered unsuppressed.

The preferred estimate for the proportion of people ever diagnosed was the mean between the high and low estimates, which resulted in 7936 PLHIV within AHIVCOS for the end of 2024. The proportion of undiagnosed individuals was estimated at 4% (range 1%-7%).

Since a significant proportion of former AHIVCOS participants either transferred their treatment to private doctors, mainly in Vienna, or left the country, the mean between the high and low estimates would not provide relevant estimates for ART treatment or viral suppression. For these two parameters, the high estimate is the more likely scenario. However, there are PLHIV who did experience LTFU, i.e. they did not transfer their treatment to private doctors or leave Austria. Therefore, we have subtracted a correction factor of 3% from the high estimate to estimate the number of people ever on ART or virus suppressed.

Year	(a) PLHIV	(b) Diagnosed [estimated range]	(c) On ART Estimate [low, high estimate]	(d) Suppressed Estimate [low, high estimate]	(e) Suppressed of all PLHIV
2010	**6254**	**84%** [80%,86%]	**86%** [76%,89%]	**83%** [71%,86%]	**60%**
2012	**6594**	**88%** [84%,90%]	**90%** [81%,93%]	**86%** [73%,89%]	**68%**
2014	**6864**	**90%** [86%,92%]	**93%** [85%,96%]	**89%** [75%,92%]	**74%**
2016	**7079**	**92%** [89%,94%]	**95%** [89%,98%]	**90%** [77%,93%]	**79%**
2018	**7480**	**94%** [91%,96%]	**96%** [91%,99%]	**91%** [76%,94%]	**82%**
2020	**7652**	**96%** [93%,99%]	**96%** [92%,99%]	**92%** [72%,95%]	**85%**
2022	**7596**	**96%** [93%, 99%]	**96%** [93%, 99%]	**92%** [70%,95%]	**85%**
2024	**7936**	**96%** [93%, 99%]	**96%** [94%, 99%]	**92%** [70%, 95%]	**85%**

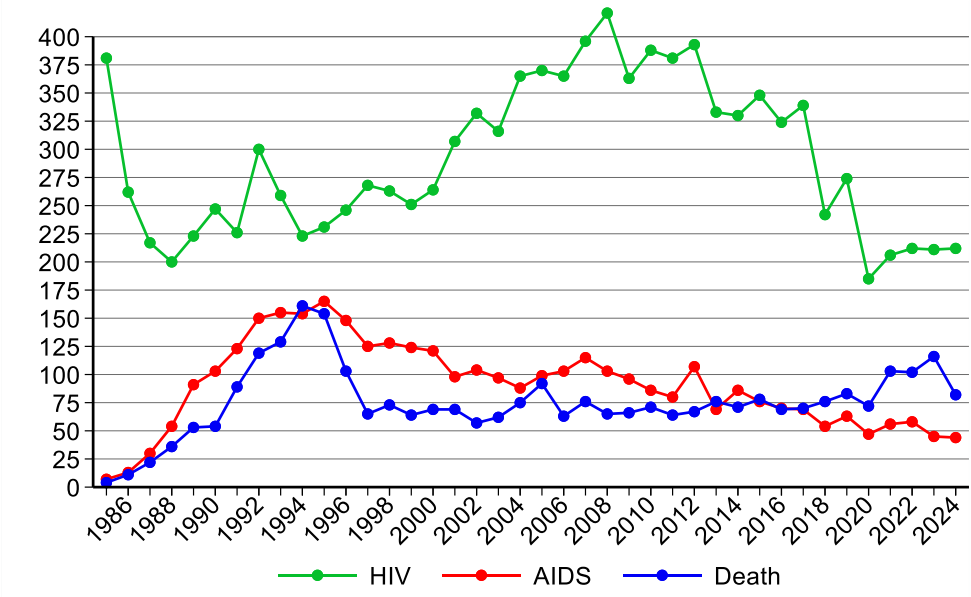
According to the Dachverband der Sozialversicherungsträger, the proportion of PLHIV in AHIVCOS in relation to the total number of PLHIV in Austria will be 63% in 2024. Assuming that the participants in AHIVCOS are representative of the whole of Austria, an extrapolation of the total number of PLHIV in Austria based on the PLHIV figure from AHIVCOS (= 7936) would result in a figure of 12600. This is clearly an overestimate, as the recording of PLHIV who have left Austria is incomplete.

A reliable estimate of the total number of PLHIV in Austria can be extrapolated from the number of people receiving ART in Austria. This figure was 8258 for 2024, which, for 92.16% (=96%x96%) on ART among PLHIV in AHIVCOS, would result in a total of 8960 PLHIV for the whole of Austria. With a confidence interval with the low limit for the number of diagnosed individuals and the proportion of them on ART, we arrive at 86.5% (93% x 93%) on ART among all PLHIV, which would result in a possible maximum total number of 9550 PLHIV in the whole of Austria.

The UNAIDS 95-95-95 targets aim to ensure that by 2030, 95% of all people living with HIV know their HIV status, 95% of all people diagnosed with HIV receive sustained antiretroviral therapy, and 95% of all people receiving antiretroviral therapy have viral suppression.

5 HIV/AIDS Surveillance in Austria

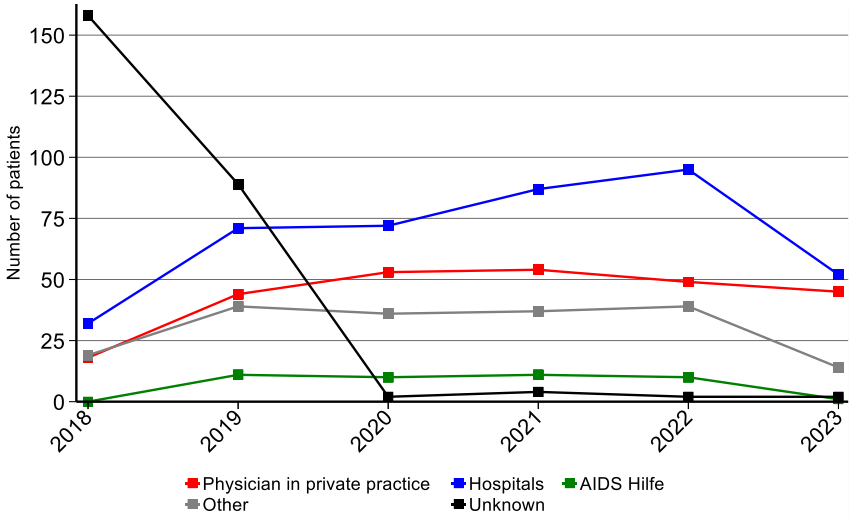
5.1 HIV, AIDS and Death in AHIVCOS per calendar year



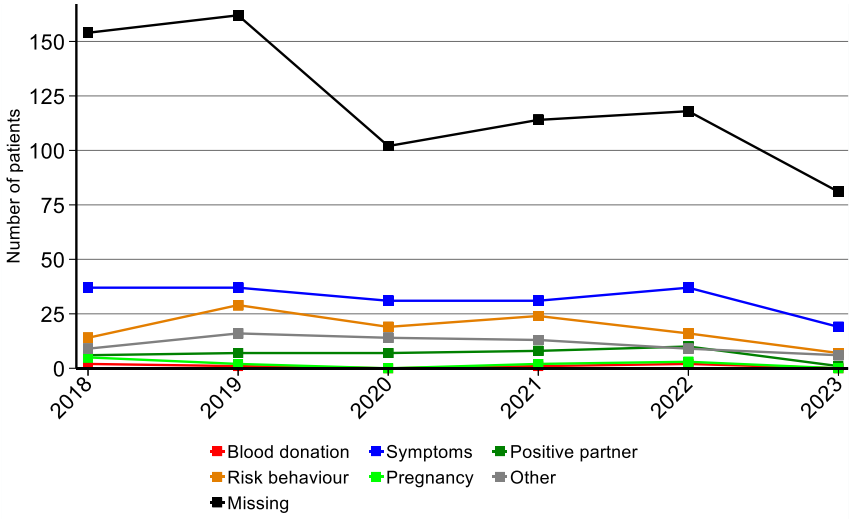
Year	HIV	AIDS	DEATH	Year	HIV	AIDS	DEATH
1985	381	7	4	2005	370	99	92
1986	262	13	11	2006	365	103	63
1987	217	30	22	2007	396	115	76
1988	200	54	36	2008	421	103	65
1989	223	91	53	2009	363	96	66
1990	247	103	54	2010	388	86	71
1991	226	123	89	2011	381	80	64
1992	300	150	119	2012	393	107	67
1993	259	155	129	2013	333	69	76
1994	223	154	161	2014	330	86	71
1995	231	165	154	2015	348	76	78
1996	246	148	103	2016	324	70	69
1997	268	125	65	2017	339	69	70
1998	263	128	73	2018	242	54	76
1999	251	124	64	2019	274	63	83
2000	264	121	69	2020	185	47	72
2001	307	98	69	2021	206	56	103
2002	332	104	57	2022	212	58	102
2003	316	97	62	2023	211	45	116
2004	365	88	75	2024	212	44	82
				Total	11772	3631	3051

5.1.1 Who initiated, offered and performed the HIV test?

Who initiated, offered and performed the HIV test for HIV-positive individuals entering the Austrian HIV cohort study in recent years? Data to answer this questions is very incomplete, however the treatment centres in Linz, Salzburg, Innsbruck and Graz provide important findings.

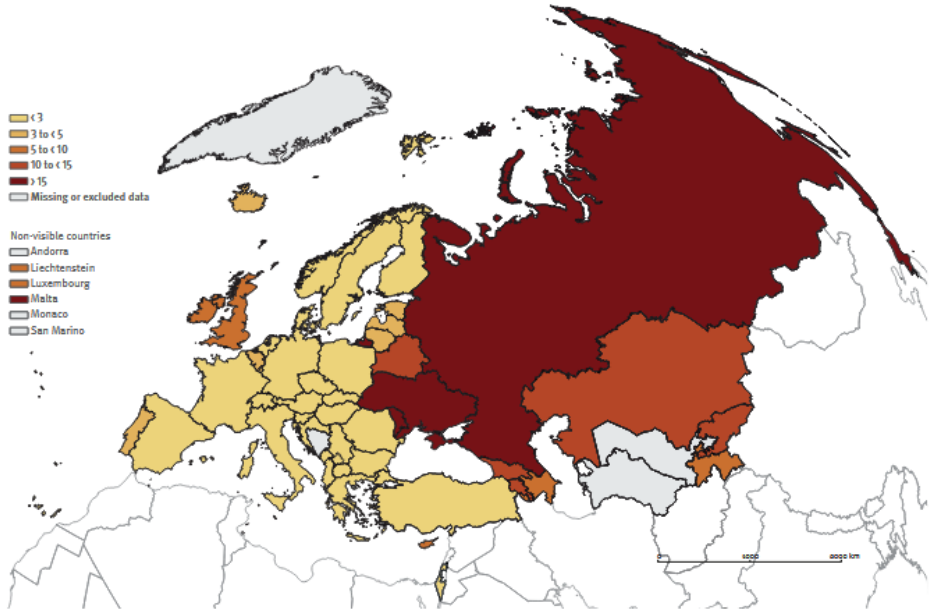


Reason for HIV test

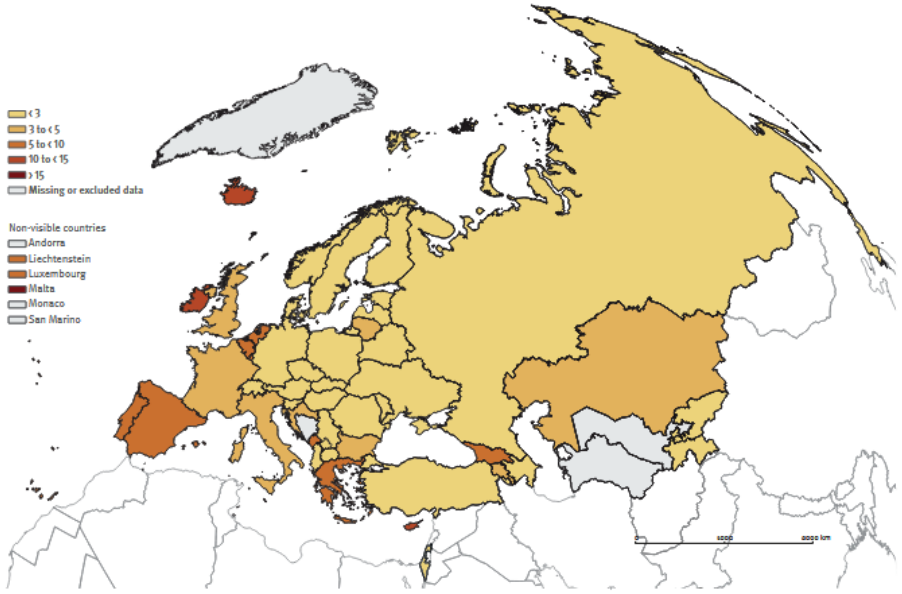


5.2 General overview (ECDC data)

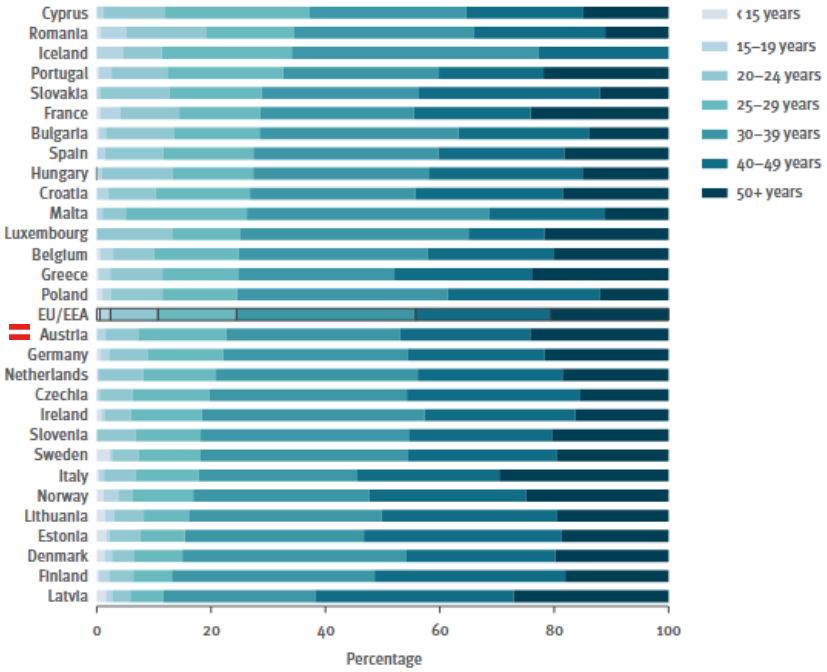
HIV diagnoses acquired through heterosexual transmission per 100 000 population, 2023



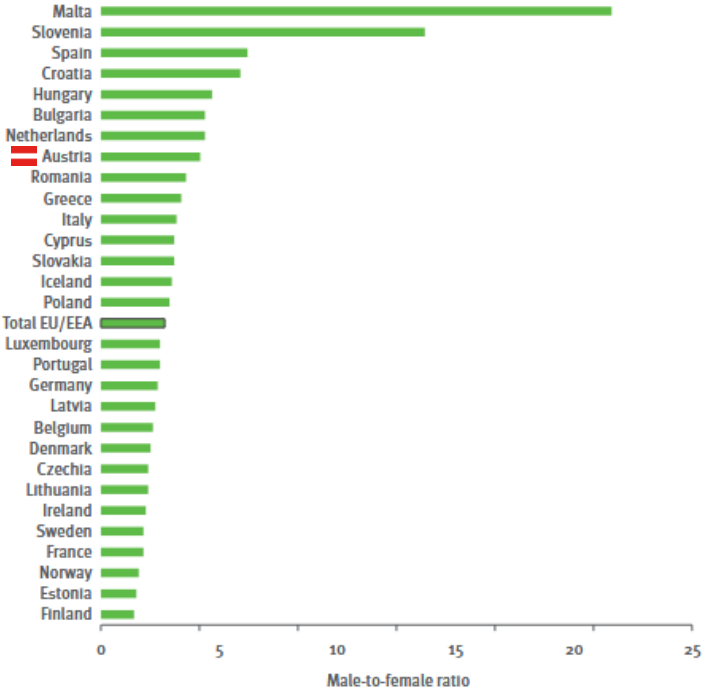
HIV diagnoses in men who have sex with men per 100 000 male population, 2023



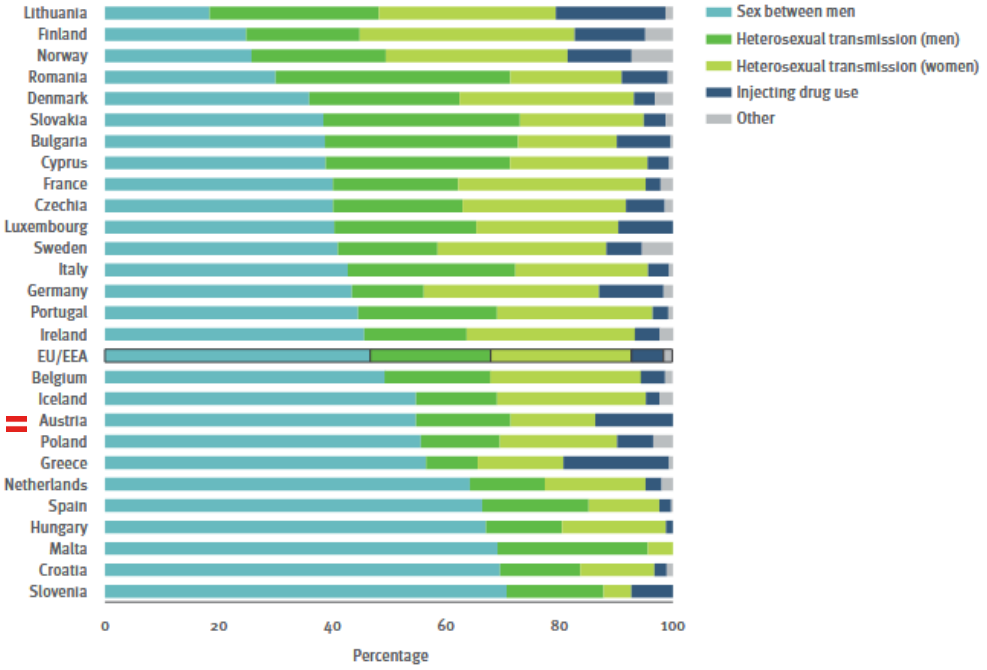
Percentage of new HIV diagnoses, by age group and country, EU/EEA, 2023 (n=24 617)



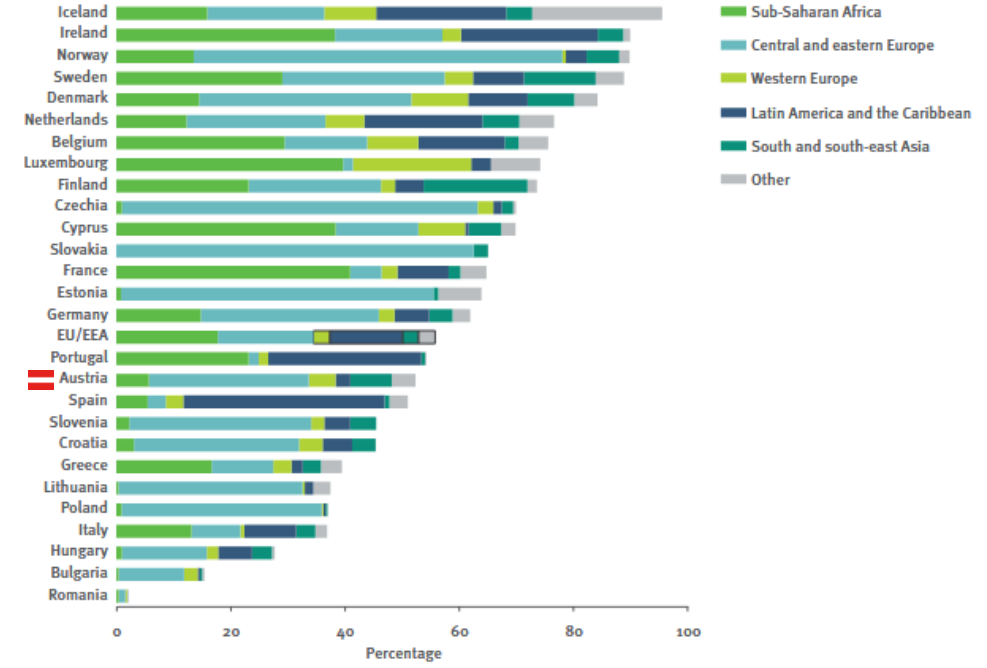
Male-to-female ratio in new HIV diagnoses, by country, EU/EEA, 2023 (n=24 481)



Percentage of new HIV diagnoses with known mode of transmission, by transmission route and country, EU/EEA, 2023 (n=17 757)



Percentage of new HIV diagnoses among migrants out of all reported cases with known information on region of origin, by country, EU/EEA, 2023 (n=21 230)



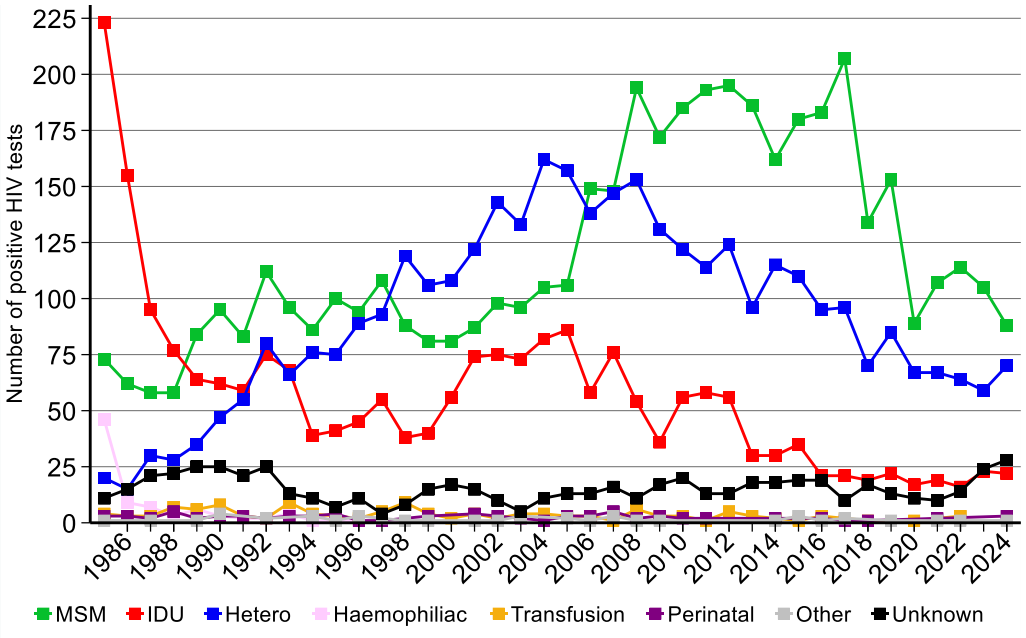
5.3 Mode of transmission

5.3.1 Transgender

There are 26 transgender women in the Austrian HIV Cohort Study.
Two of them died and median age at diagnosis is 30.2. Fourteen are Austrian nationality.
17 had a visit in the last 12 months. Median age of those with a follow up in the last 12 months is 47.0 (mean 47.0).

If gender and transmission are combined, transgender persons are put in the group Other or *excluded* from the analyses.

5.3.2 All modes of transmission

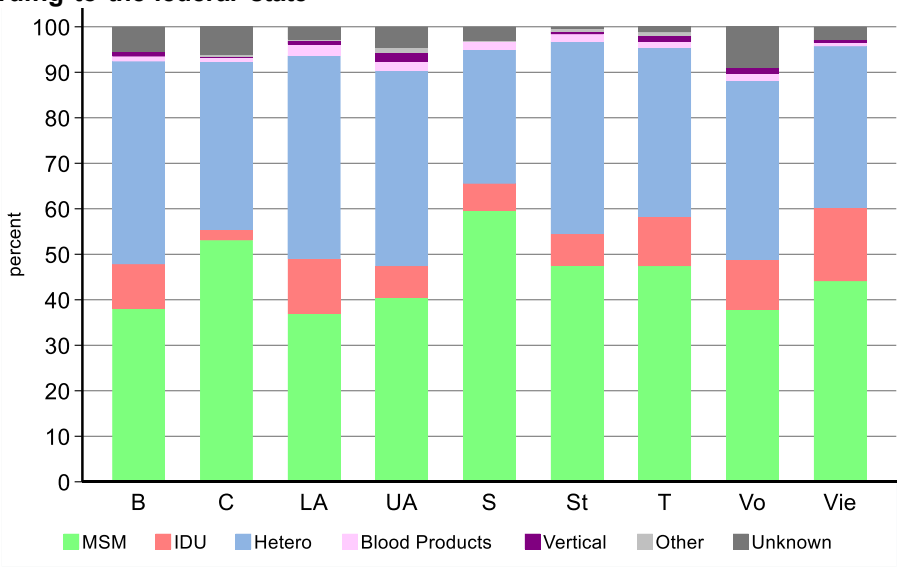


The abbreviation MSM is used for „Men who have sex with men". IDU means „Injecting Drug Use". The category IDU also includes men who are both MSM and IDU. The category "blood products" includes cohort participants who have received coagulation compounds or blood transfusions. Among the patients with a follow-up in the last 12 months, 38.34% have been infected through heterosexual contacts, 44.62% through homosexual contacts and 11.23% through the injection of drugs.

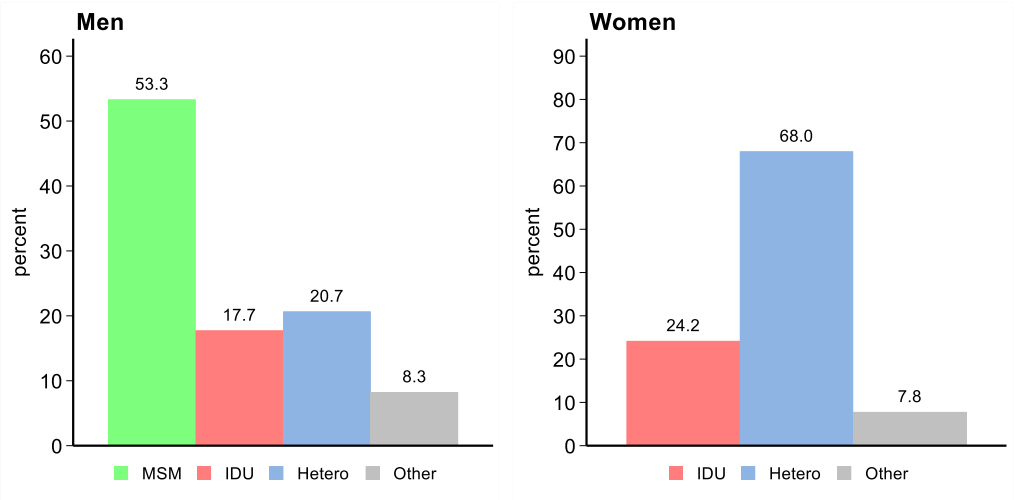
	BMSGPK	AHIVCOS											
Test Year	Total	MSM		IDU		Heterosexually infected		Others		Total	Women		
1998	313	88	33.46%	38	14.45%	119	45.25%	18	6.84%	263	60	22.81%	
1999	339	81	32.27%	40	15.94%	106	42.23%	24	9.56%	251	70	27.89%	
2000	428	81	30.68%	56	21.21%	108	40.91%	19	7.20%	264	77	29.17%	
2001	402	87	28.34%	74	24.10%	122	39.74%	24	7.82%	307	74	24.10%	
2002	442	98	29.52%	75	22.59%	143	43.07%	16	4.82%	332	93	28.01%	
2003	423	96	30.38%	73	23.10%	133	42.09%	14	4.43%	316	96	30.38%	
2004	470	105	28.77%	82	22.47%	162	44.38%	16	4.38%	365	112	30.68%	
2005	453	106	28.65%	86	23.24%	157	42.43%	21	5.68%	370	100	27.03%	
2006	435	149	40.82%	58	15.89%	138	37.81%	20	5.48%	365	88	24.11%	
2007	515	148	37.37%	76	19.19%	147	37.12%	25	6.31%	396	92	23.23%	
2008	505	194	46.08%	54	12.83%	153	36.34%	20	4.75%	421	100	23.75%	
2009	507	172	47.38%	36	9.92%	131	36.09%	24	6.61%	363	80	22.04%	
2010	487	185	47.68%	56	14.43%	122	31.44%	25	6.44%	388	77	19.85%	
2011	525	193	50.66%	58	15.22%	114	29.92%	16	4.20%	381	79	20.73%	
2012	523	195	49.62%	56	14.25%	124	31.55%	18	4.58%	393	81	20.61%	
2013	481	186	55.86%	30	9.01%	96	28.83%	21	6.31%	333	53	15.92%	
2014	403	162	49.09%	30	9.09%	115	34.85%	23	6.97%	330	74	22.42%	
2015	428	180	51.72%	35	10.06%	110	31.61%	23	6.61%	348	49	14.08%	
2016	447	183	56.48%	21	6.48%	95	29.32%	25	7.72%	324	57	17.59%	
2017	510	207	61.06%	21	6.19%	96	28.32%	15	4.42%	339	57	16.81%	
2018	323 / 74*	134	55.37%	19	7.85%	70	28.93%	19	7.85%	242	43	17.77%	
2019	336 / 94*	153	55.84%	22	8.03%	85	31.02%	14	5.11%	274	42	15.33%	
2020	283 / 49*	89	48.11%	17	9.19%	67	36.22%	12	6.49%	185	32	17.30%	
2021	310 / 66*	107	51.94%	19	9.22%	67	32.52%	13	6.31%	206	34	16.50%	
2022	395 / 78*	114	53.77%	16	7.55%	64	30.19%	18	8.49%	212	40	18.87%	
2023	341 / 60*	105	49.76%	23	10.90%	59	27.96%	24	11.37%	211	40	18.96%	
2024	383 / 81*	88	41.51%	22	10.38%	70	33.02%	32	15.09%	212	45	21.23%	

*Second number indicates the number of people tested anonymously

Transmission category in participants with follow-up within the last 12 months according to the federal state

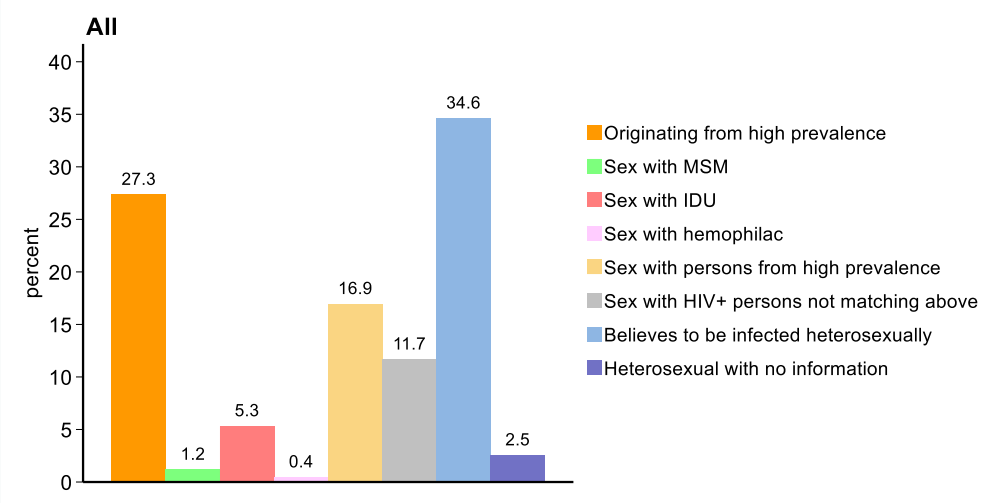


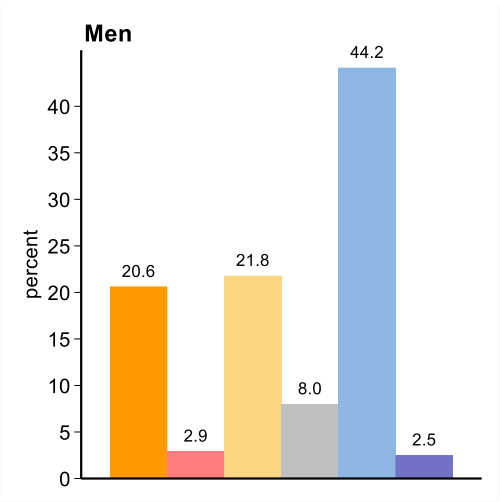
5.3.3 Categories of transmission

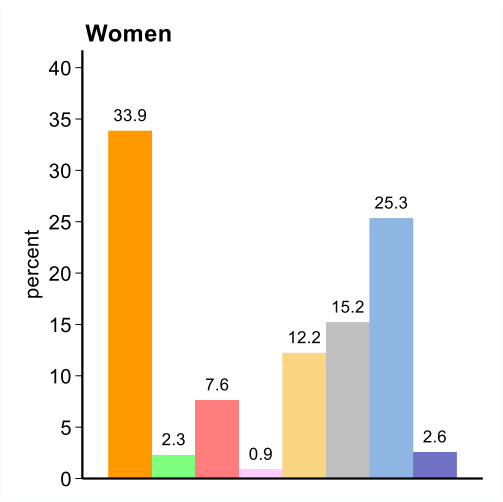


5.3.3.1 Categories of heterosexually acquired infections

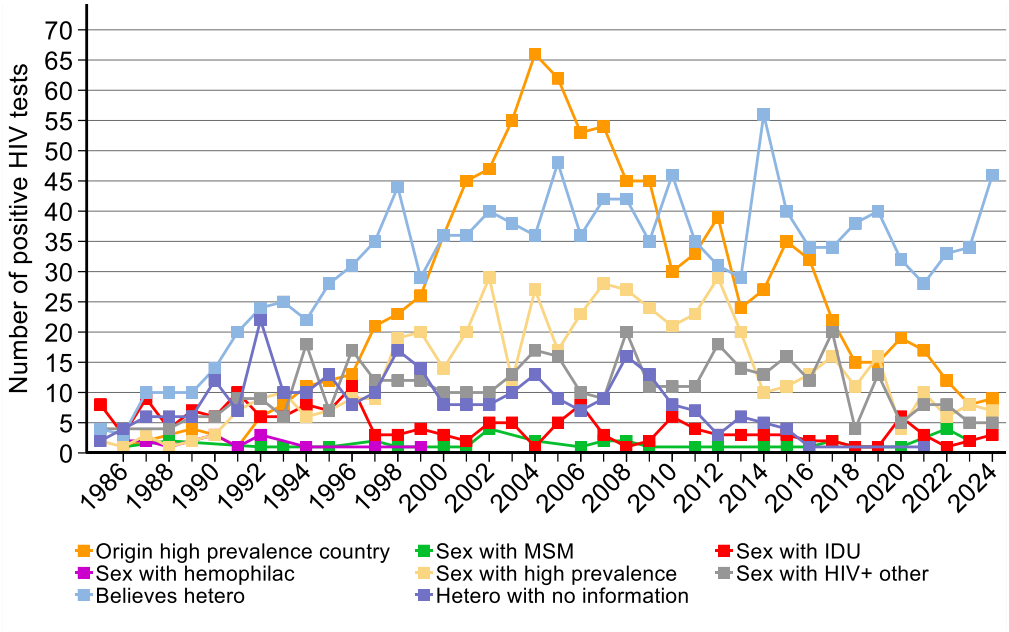
Transgender persons are excluded from the following analysis.
Because of missing data, the HIV treatment centre Penzing Vienna has also been excluded from some analyses.







Sub-categories of heterosexually acquired infections

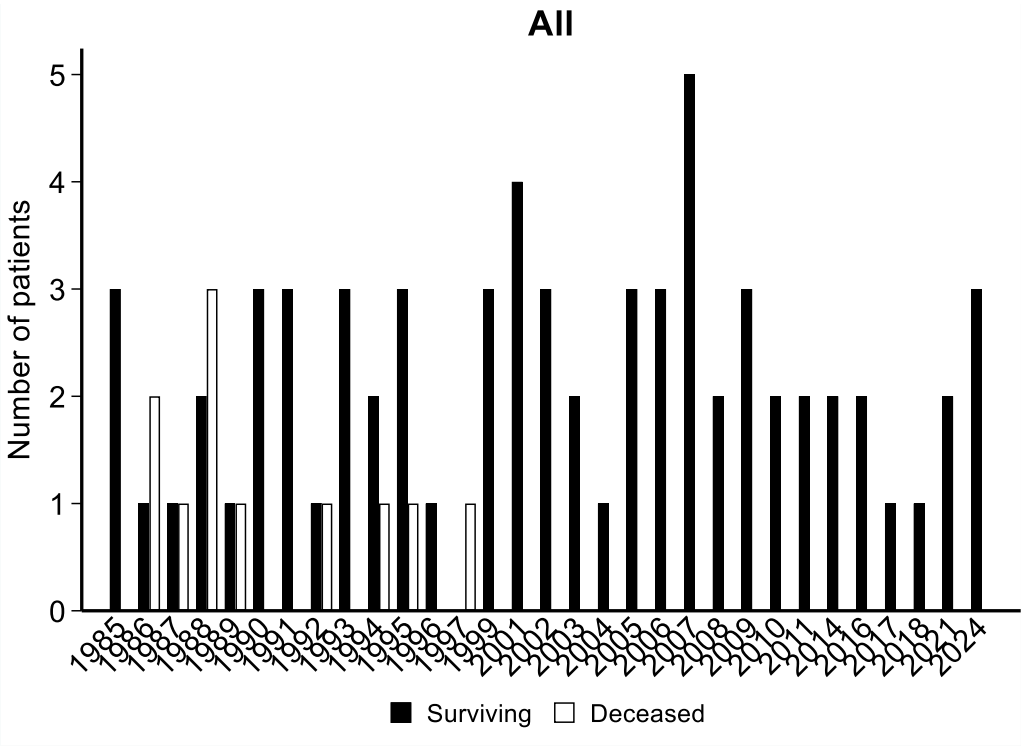


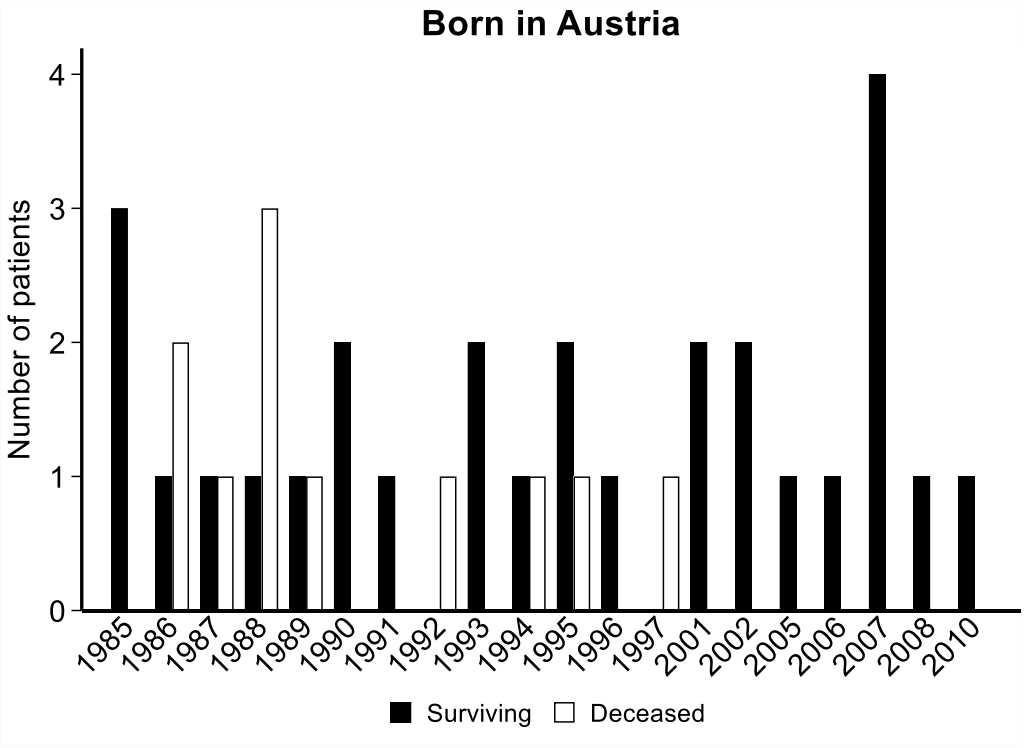
5.3.4 Mother-to-child-transmission

Nowadays, mother-to-child-transmission is the only route of HIV transmission amongst children. All HIV infected children in Austria are followed in paediatric HIV treatment centres, therefore the data presented here are related to patients who have also been in care by the adult HIV treatment centres. Obviously, these data are incomplete.

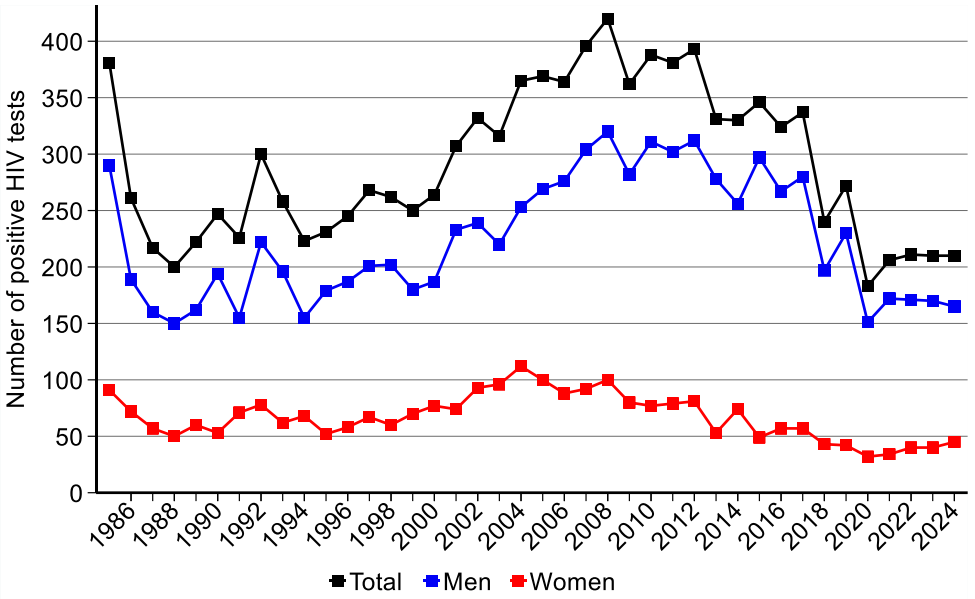
	Living participants		Deceased participants	Total
	<18 years	>18 years		
Burgenland	0	2	0	**2**
Carinthia	0	1	0	**1**
Lower Austria	0	5	0	**5**
Upper Austria	2	11	1	**14**
Salzburg	1	0	0	**1**
Styria	0	4	0	**4**
Tyrol	3	4	4	**11**
Vorarlberg	0	3	3	**6**
Vienna	3	19	3	**25**
Missing residency	0	1	0	**1**
Foreign	2	7	0	**9**
Total	**11**	**57**	**11**	**79**

In January 2010, routine HIV testing in pregnancy was introduced in Austria. The HIV test is part of the mother-child booklet (*Mutter-Kind-Pass*). In order to be eligible for childcare allowance *(Kinderbetreuungsgeld)* you must have the first ten examinations stipulated in the mother-child booklet done correctly and obtain proof of it. Recently, at least two transmissions of mother-to-child in Austria have been linked to counselling with HIV denialists.


All
Number of patients
0
1
2
3
4
5
1985
1986
1987
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
1999
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2014
2016
2017
2018
2021
2024
Surviving
Deceased

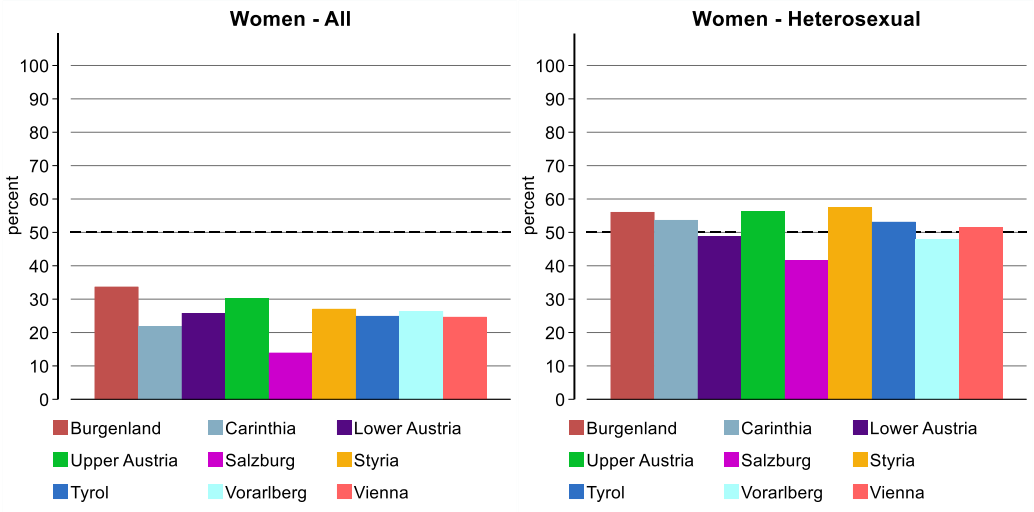

Born in Austria
Number of patients
0
1
2
3
4
1985
1986
1987
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
2001
2002
2005
2006
2007
2008
2010
Surviving
Deceased

5.4 HIV diagnoses by sex



25.2% of the patients with a follow-up within the last 12 months are female. The rate is highest in Burgenland (33.7%) and Upper Austria (30.2%).
In the subgroup of heterosexually acquired infections, the rate of the women is 52.4%. It is highest in Styria (57.4%), Upper Austria (56.3%) and Burgenland (56.1%).

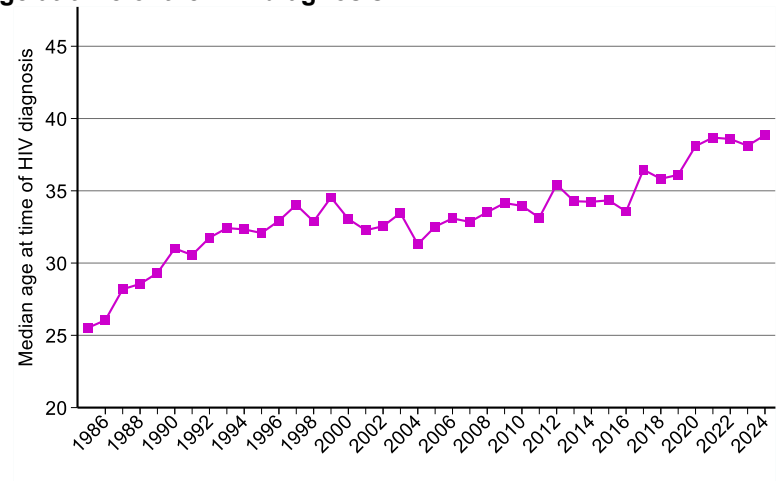
Proportion of women in participants with a follow-up in the last 12 months according to federal states

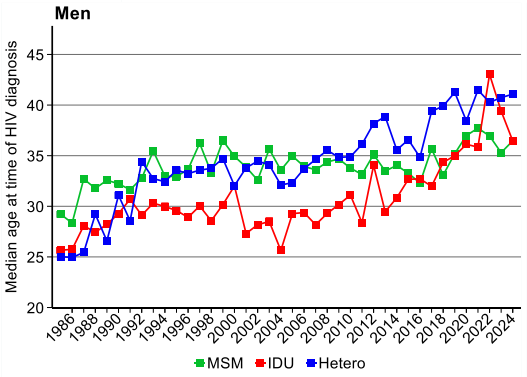


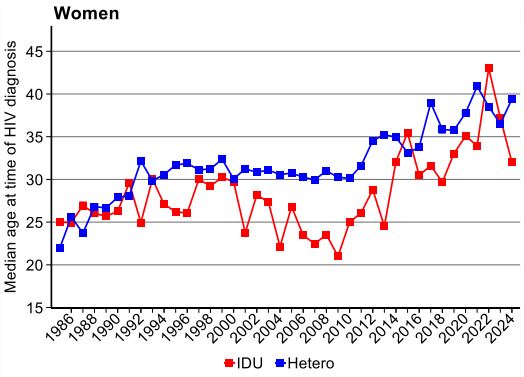
5.5 Age

5.5.1 Age at time of HIV diagnosis

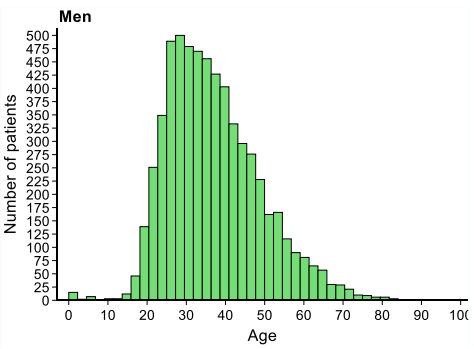
Median age at time of the HIV diagnosis

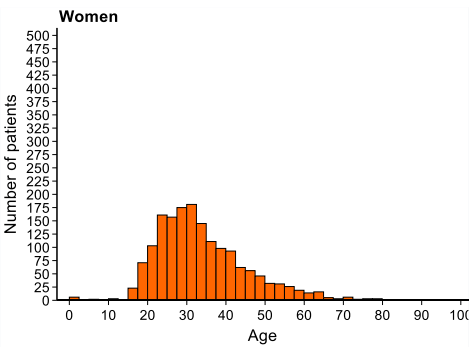


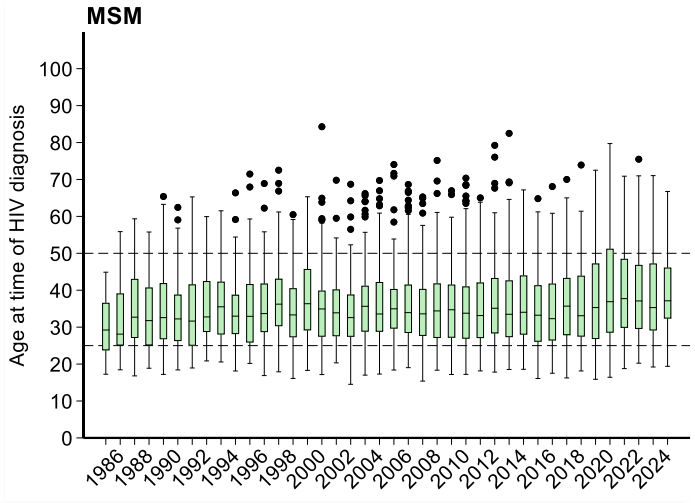


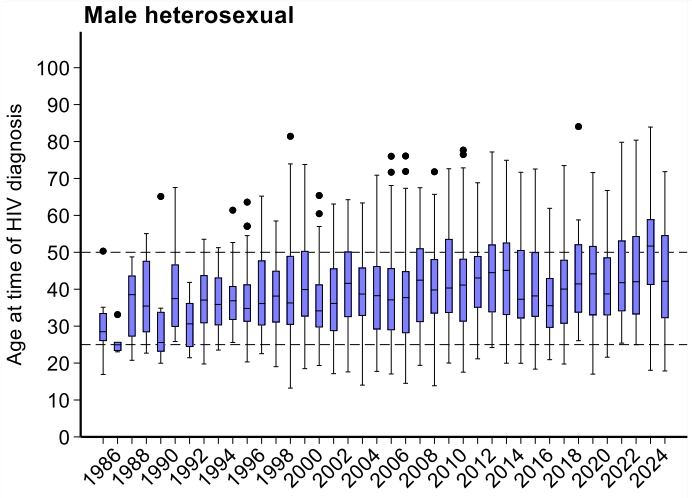


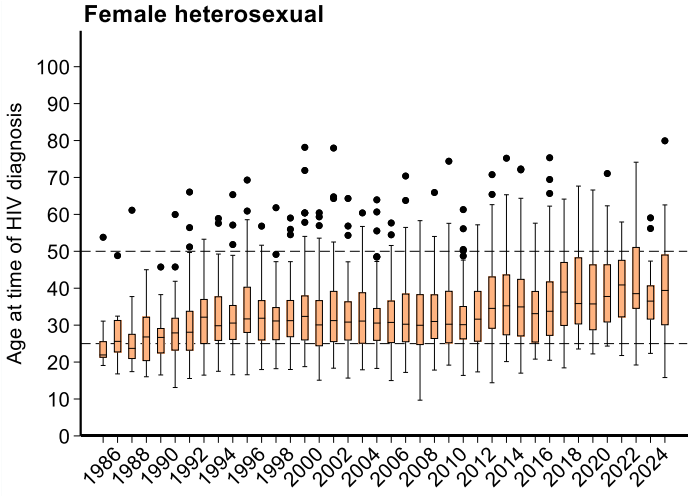
Age at time of the HIV diagnosis





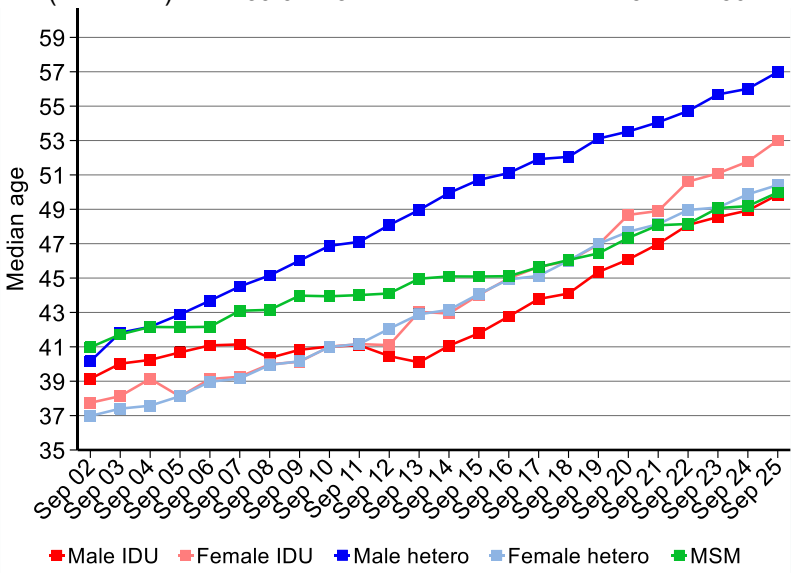

MSM
Age at time of HIV diagnosis
0
10
20
30
40
50
60
70
80
90
100
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020
2022
2024


Male heterosexual
Age at time of HIV diagnosis
0
10
20
30
40
50
60
70
80
90
100
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020
2022
2024

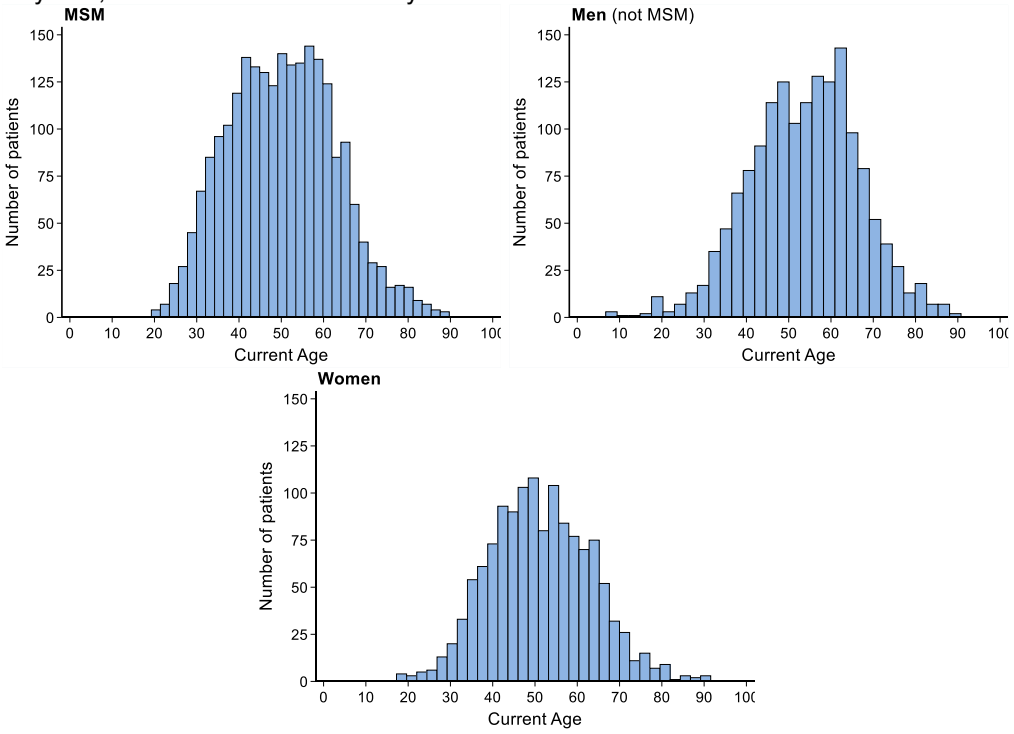

Female heterosexual
Age at time of HIV diagnosis
0
10
20
30
40
50
60
70
80
90
100
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020
2022
2024

5.5.2 Age of patients currently in care

Overall, median age increased from 39.2 in September 2002 to 51.1 in September 2025. In MSM, median age increased from 41.0 in September 2002 to 49.9 in September 2025, in men (not MSM) from 39.9 to 54.1 and in women from 37.1 to 50.1.



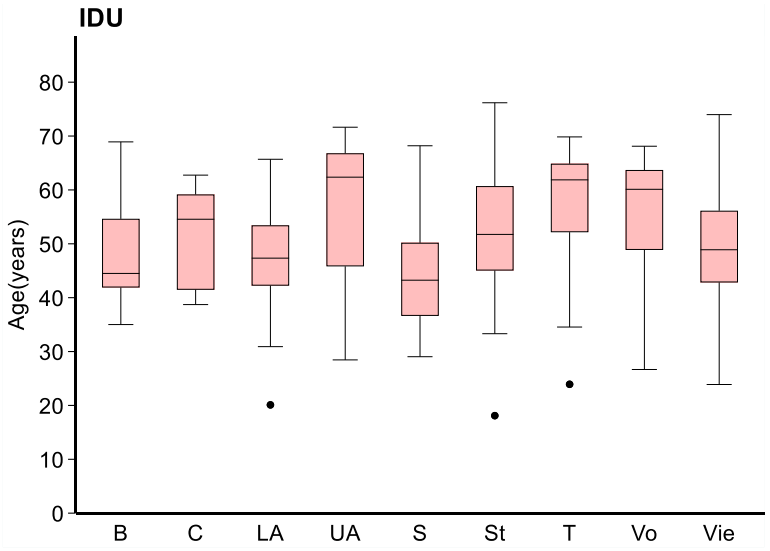
Median and average age are 51.4 and 51.6 years, respectively. 26.4% are older than 60 years, 54.0% are older than 50 years.



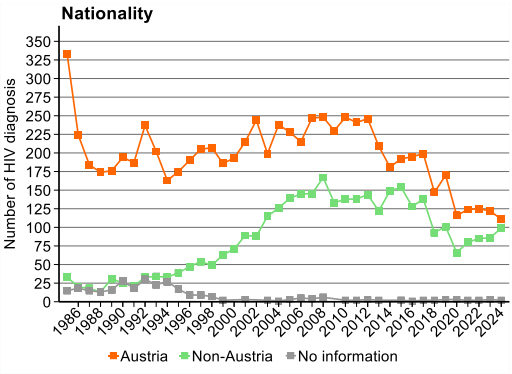
Age across the federal states: follow-up in the last 12 months

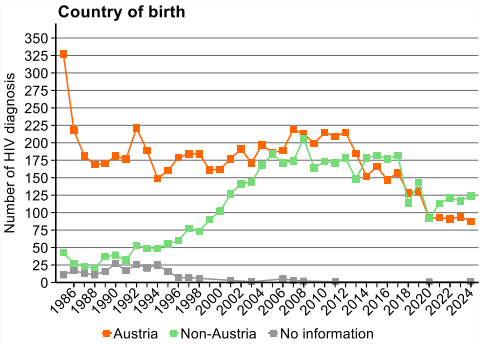
Federal state	Median Age years	≥50 years	≥60 years	≥75 years
Burgenland	52.3	59.8	31.5	3.3
Carinthia	53.0	61.6	27.1	2.1
Lower Austria	54.0	61.1	31.1	6.6
Upper Austria	50.8	52.4	29.8	3.2
Salzburg	50.1	50.7	24.5	2.6
Styria	50.8	52.2	23.7	2.6
Tyrol	54.2	59.1	30.2	3.5
Vorarlberg	53.0	54.7	27.2	6.7
Vienna	50.0	50.3	23.3	2.8
Total	**51.4**	**54.0**	**26.4**	**3.5**

Age in Injecting Drug Users according to federal states



5.6 Nationality and country of birth



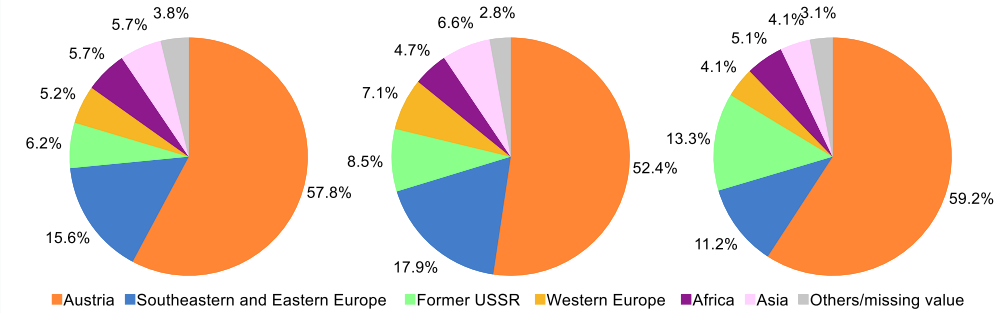


5.6.1 Overview

	BMSGPK	AHIVCOS								
Test Year	Total	Austria		Low prevalence countries		High prevalence countries		Missing value		Total
1998	313	207	78.71%	31	11.79%	18	6.84%	7	2.66%	263
1999	339	186	74.10%	43	17.13%	20	7.97%	2	0.80%	251
2000	428	193	73.11%	39	14.77%	32	12.12%	0	0.00%	264
2001	402	215	70.03%	50	16.29%	39	12.70%	3	0.98%	307
2002	442	244	73.49%	53	15.96%	35	10.54%	0	0.00%	332
2003	423	199	62.97%	63	19.94%	52	16.46%	2	0.63%	316
2004	470	238	65.21%	67	18.36%	59	16.16%	1	0.27%	365
2005	453	228	61.62%	65	17.57%	74	20.00%	3	0.81%	370
2006	435	215	58.90%	83	22.74%	62	16.99%	5	1.37%	365
2007	515	247	62.37%	83	20.96%	62	15.66%	4	1.01%	396
2008	505	248	58.91%	112	26.60%	55	13.06%	6	1.43%	421
2009	507	230	63.36%	84	23.14%	49	13.50%	0	0.00%	363
2010	487	248	63.92%	106	27.32%	32	8.25%	2	0.52%	388
2011	525	241	63.25%	108	28.35%	30	7.87%	2	0.52%	381
2012	523	246	62.60%	107	27.23%	37	9.41%	3	0.76%	393
2013	481	209	62.76%	100	30.03%	22	6.61%	2	0.60%	333
2014	403	181	54.85%	113	34.24%	36	10.91%	0	0.00%	330
2015	428	192	55.17%	117	33.62%	37	10.63%	2	0.57%	348
2016	447	195	60.19%	98	30.25%	30	9.26%	1	0.31%	324
2017	510	199	58.70%	119	35.10%	19	5.60%	2	0.59%	339
2018	323 / 74*	147	60.74%	83	34.30%	10	4.13%	2	0.83%	242
2019	336 / 94*	170	62.04%	86	31.39%	15	5.47%	3	1.09%	274
2020	283 / 49*	116	62.70%	58	31.35%	8	4.32%	3	1.62%	185
2021	310 / 66*	124	60.19%	69	33.50%	11	5.34%	2	0.97%	206
2022	395 / 78*	125	58.96%	75	35.38%	10	4.72%	2	0.94%	212
2023	341 / 60*	122	57.82%	76	36.02%	10	4.74%	3	1.42%	211
2024	383 / 81*	111	52.36%	88	41.51%	11	5.19%	2	0.94%	212

* Second number indicates the number of people tested anonymously

5.6.2 Nationality: HIV diagnoses between 2023 and 2025

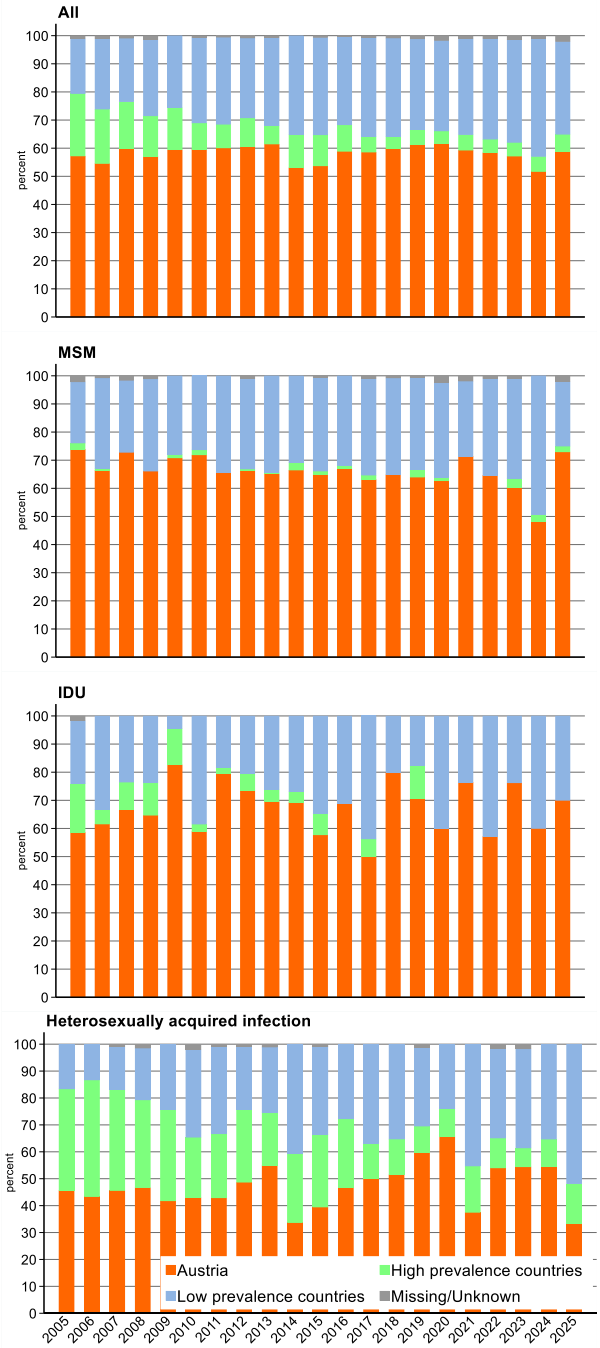


HIV diagnosis 2023 N=211	
Afghanistan	4
Azerbaijan	1
Argentina	1
Austria	122
Bosnia and Herzegovina	5
Bulgaria	2
Cameroon	2
China	2
Colombia	2
Democratic Republic of the Congo	1
Dominican Republic	1
Ethiopia	1
France	1
Germany	6
Ghana	1
Indonesia	2
Italy	2
Cote d'Ivoire	2
Nigeria	2
Pakistan	1
Poland	2
Portugal	1
Romania	9
Russian Federation	1
Serbia	1
Slovakia	2
Slovenia	1
Somalia	3
Switzerland	1
Syrian Arab Republic	3
Turkey	9
Ukraine	11
Unknown	3
The former Yugoslav Republic of Macedonia	2
Venezuela	1

HIV diagnosis 2024 N=212	
Afghanistan	3
Algeria	1
Austria	111
Belgium	1
Bosnia and Herzegovina	2
Brazil	2
Cambodia	1
Colombia	1
Croatia	3
Czech Republic	1
Dominican Republic	1
France	1
Gabon	1
Occupied Palestinian Territory	1
Germany	11
Greece	1
Hungary	3
India	1
Iran	1
Iraq	1
Italy	1
Kazakhstan	1
Kenya	2
Nigeria	2
Philippines	2
Poland	2
Romania	8
Russian Federation	3
Serbia	6
Slovakia	4
Slovenia	1
Somalia	2
Syrian Arab Republic	2
Thailand	2
Tunisia	1
Turkey	7
Ukraine	14
Unknown	2
The former Yugoslav Republic of Macedonia	1
United Republic of Tanzania	1

HIV diagnosis 2025 N=98	
Afghanistan	1
Austria	58
Bosnia and Herzegovina	1
Brazil	1
Bulgaria	1
Croatia	1
Georgia	1
Germany	1
Ghana	1
Greece	1
Hungary	2
Ireland	1
Italy	1
Nigeria	1
Pakistan	1
Guinea-Bissau	1
Russian Federation	1
Serbia	2
Slovakia	2
Somalia	1
Thailand	2
Tunisia	1
Turkey	2
Ukraine	11
Unknown	2

5.6.3 Nationality



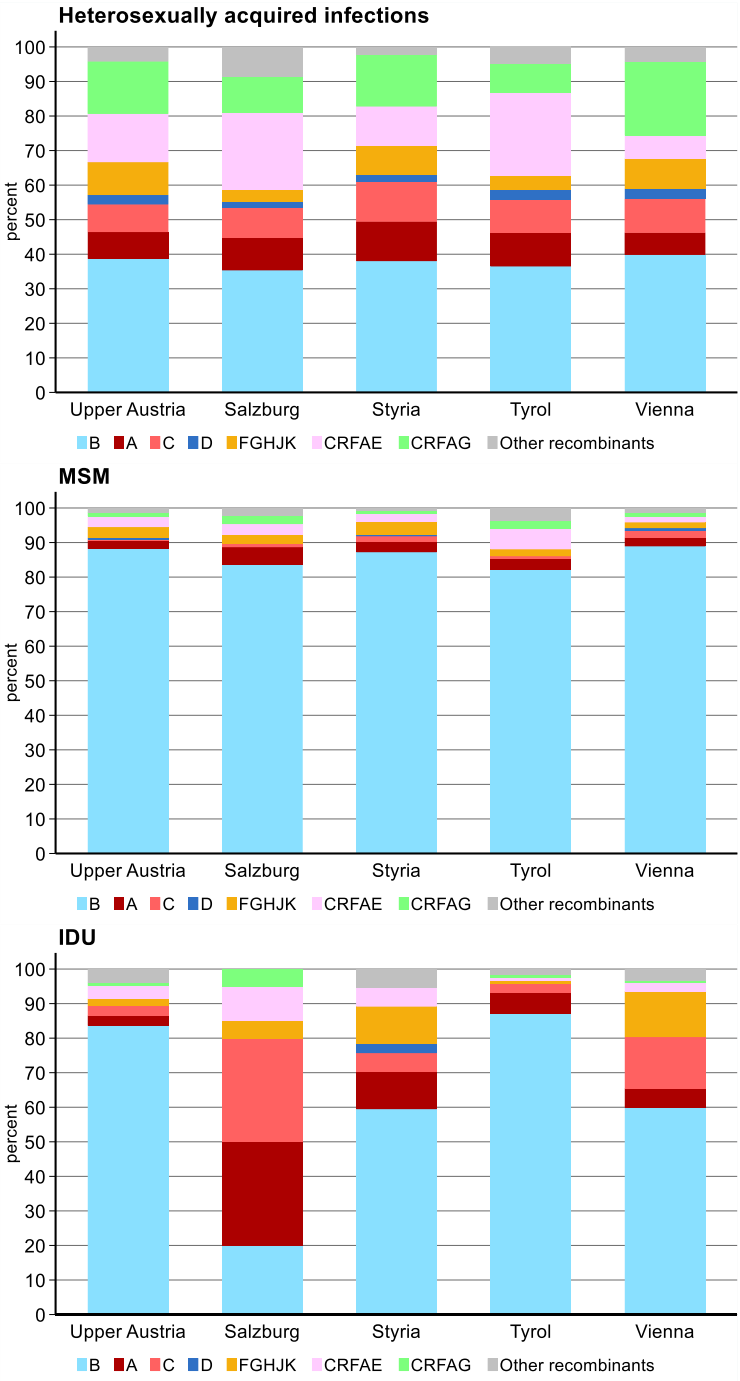
Low prevalence countries are countries with an HIV infection rate of adults <1%, high prevalence countries are countries with an HIV infection rate of adults ≥1%.

5.6.4 Refugees from Ukraine (after March 1st 2022)

Center	Men	Women	Children	ART	Total
Penzing	8	15	0	23	23
AKH Vienna	17	25	1	41	43
Favoriten	8	8	0	16	16
Linz	9	21	2	31	32
Salzburg	5	9	0	14	14
Innsbruck	6	10	2	18	18
Feldkirch	4	4	0	8	8
Graz	5	16	1	20	22
Klagenfurt	1	4	0	5	5
Total	**63**	**112**	**6**	**176**	**181**

5.7 HIV-1 subtypes

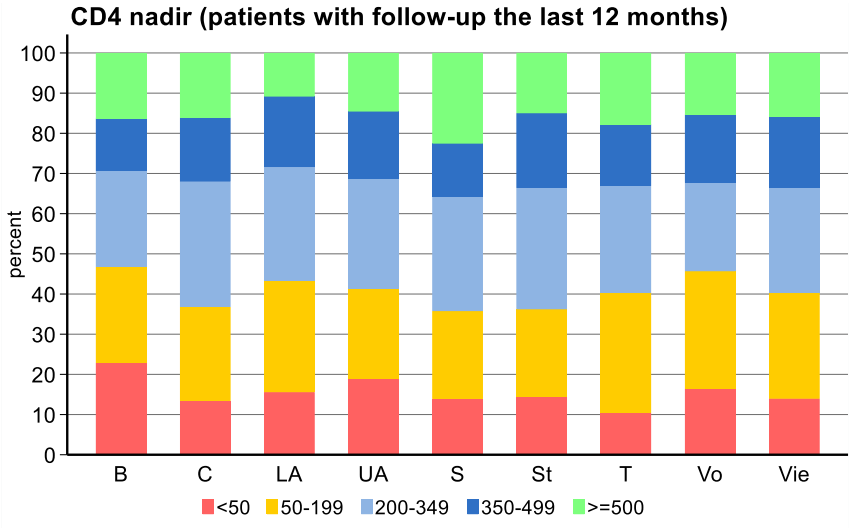
Subtypes were determined by genotypic resistance testing of Reverse Transcriptase and Protease according to Stanford database. Overall 4082 subtypes were available.



5.8 Stage of HIV disease

5.8.1 Lowest ever measured CD4 cell count

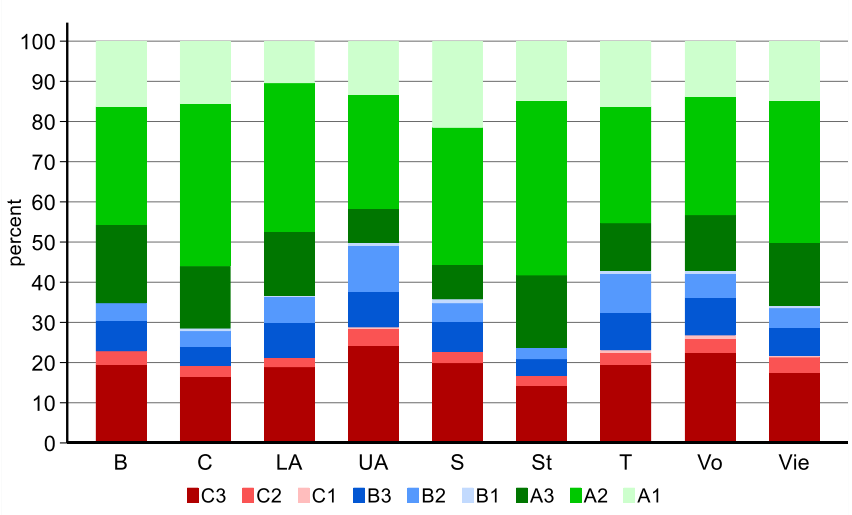
The median of the lowest CD4 cell count ever measured („CD4 nadir“) in the patients with follow-up in the last 12 months is 249/µl.



5.8.2 Proportion of Patients with AIDS

The classification of the HIV infection according to CDC puts patients in one of three clinical categories (A, B, C) and one of three CD4 cell count categories (1, 2, 3).

CD4 count		**A** Asymptomatic	**B** Non-AIDS defining conditions	**C** AIDS
1	≥ 500/µl	**A1**	**B1**	**C1**
2	200-499/µl	**A2**	**B2**	**C2**
3	< 200/µl	**A3**	**B3**	**C3**



5.9 „Elite-controllers“ and „viremia-controllers“

Median time from HIV-1 infection to death in untreated patients is estimated to be approximately 10-12 years. However, there is considerable variation in survival time between patients. A small number of patients remain asymptomatic for many years and maintain high CD4 cell counts or low plasma HIV RNA levels, or both, without antiretroviral therapy. Patients able to maintain high CD4 counts have been called “long-term non-progressors”, whilst those with low viral loads have been called “HIV controllers” or “elite controllers”. Viremic controllers have low but readily measurable virus loads. Elite controllers suppress HIV to extremely low levels, measurable only by sensitive laboratory techniques.

Being ART naïve	**HIV-infected up to 10 years N=21**		**HIV-infected for over 10 years N=9**	
	N	**%**	**N**	**%**
HIV RNA ≤ 50 copies/ml	11	52.4%	4	44.5%
HIV RNA < 400 copies/ml	14	66.7%	8	88.9%
CD4 > 500 cells/µl	4	19.0%	4	44.5%
CD4 > 500 cells/µl and HIV RNA ≤ 50 copies/ml	3	14.3%	1	11.2%
CD4 > 500 cells/µl and HIV RNA < 400 copies/ml	3	14.3%	4	44.5%

6 Diagnosis of HIV and presentation to an HIV centre

6.1 Presentation to an HIV centre

Austria has one of the highest rates of HIV tests in Europe (more than 75 tests per year per 1000 population). Nevertheless, a substantial portion of the patients (>40%) are diagnosed late (CD4 cell count <350/µl).

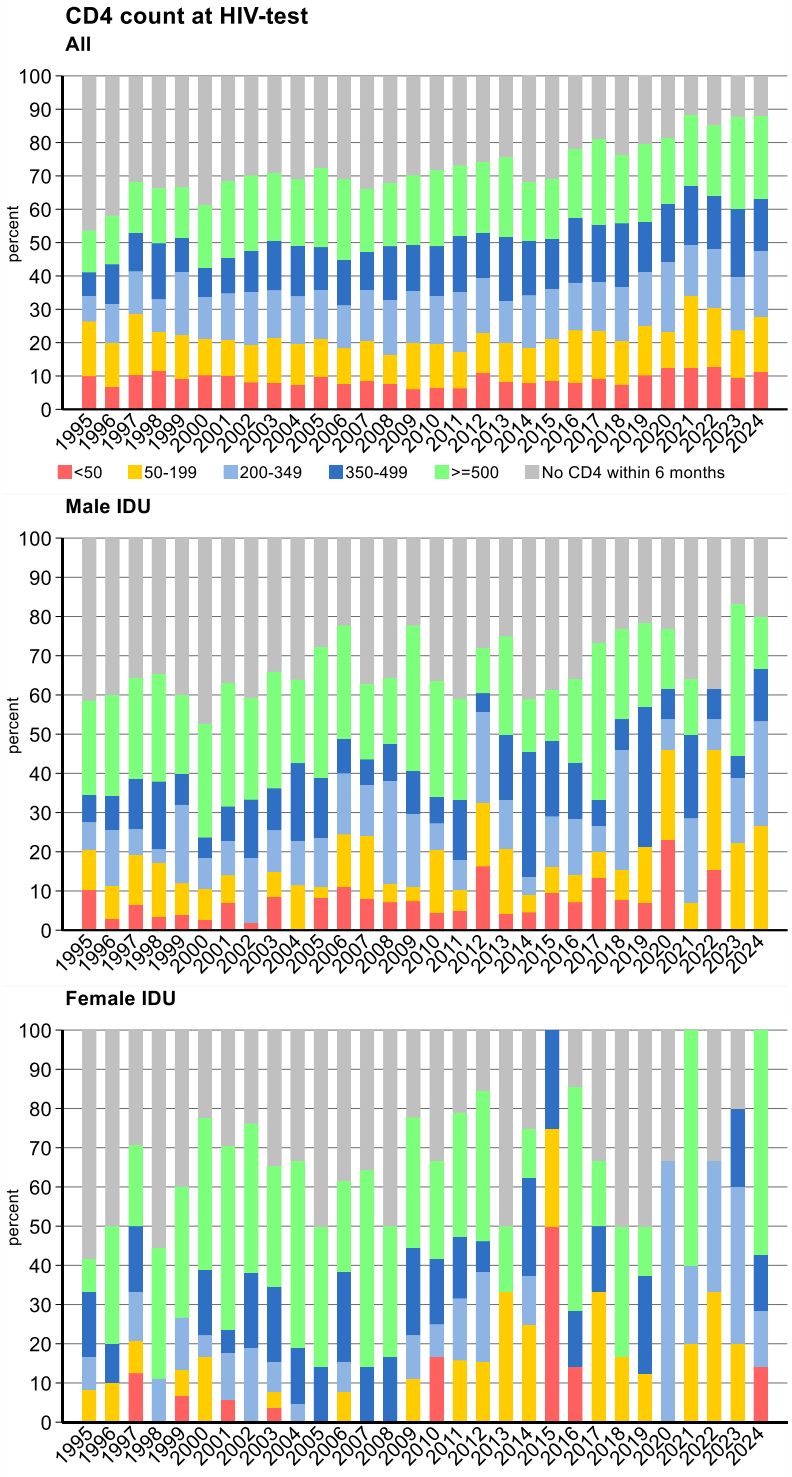
Year of HIV diagnosis	Time between HIV test and first CD4 cell count measurement in months						First CD4 cell count (all patients, 474 missing)		
	All Patients			IDU					
	N	Median	90 Per	N	Median	90 Per	Median	Quartiles	
1985	342	64.5	181.1	199	50.1	133.4	313.5	119.0	545.0
1990	228	18.6	107.3	59	5.3	62.2	255.0	50.0	529.0
1995	221	2.7	101.4	39	4.2	101.4	240.0	90.0	480.0
2000	257	1.1	130.6	56	2.3	88.6	361.0	156.0	566.0
2005	363	0.7	106.9	86	1.2	80.0	357.0	165.0	540.0
2006	354	0.8	77.4	58	1.1	51.1	374.5	199.0	583.0
2007	385	0.7	90.5	75	2.0	82.9	332.0	160.0	575.0
2008	411	0.8	91.9	54	1.6	91.9	404.0	228.0	570.0
2009	350	0.6	82.3	36	0.8	38.1	344.0	199.0	563.0
2010	378	0.6	72.9	56	0.7	120.4	396.5	200.0	638.0
2011	369	0.6	58.4	56	1.5	38.8	384.0	225.0	574.0
2012	387	0.6	48.4	56	1.1	45.9	361.0	168.0	578.0
2013	323	0.5	43.9	29	1.5	40.9	405.0	209.0	632.0
2014	320	0.7	61.1	30	1.8	51.8	395.0	203.5	593.5
2015	332	0.5	38.2	35	1.6	38.5	385.0	180.5	576.0
2016	312	0.5	31.7	20	0.8	85.1	376.5	164.5	589.5
2017	329	0.5	40.9	21	1.3	45.7	402.0	197.0	615.0
2018	236	0.4	49.5	18	1.8	72.0	393.0	218.5	640.5
2019	271	0.4	38.8	22	1.9	36.0	375.0	171.0	606.0
2020	182	0.4	23.0	17	2.2	33.4	364.0	198.0	571.0
2021	204	0.4	12.4	18	0.6	34.9	308.5	108.0	515.0
2022	208	0.4	9.1	16	1.2	18.3	338.0	130.5	541.5
2023	204	0.4	4.7	22	0.7	8.3	375.0	185.5	556.5
2024	203	0.4	4.1	20	0.8	3.9	342.0	174.0	548.0
2025	97	0.3	0.8	10	0.4	0.9	344.0	178.0	540.0

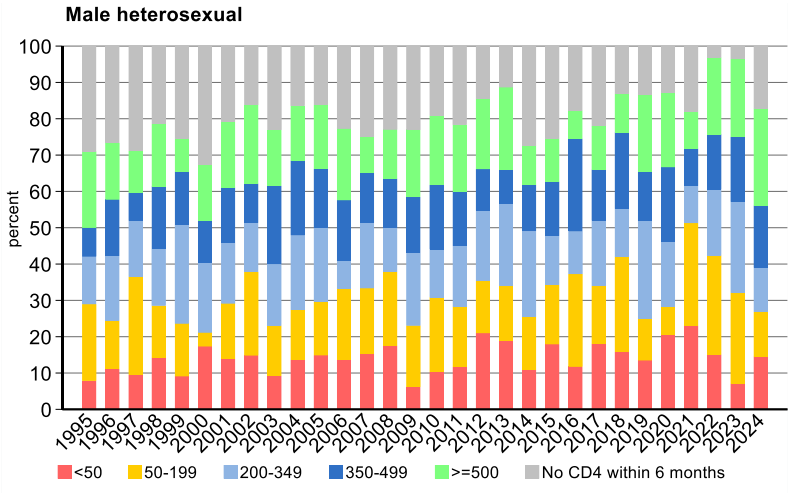
6.1.1 Definitions

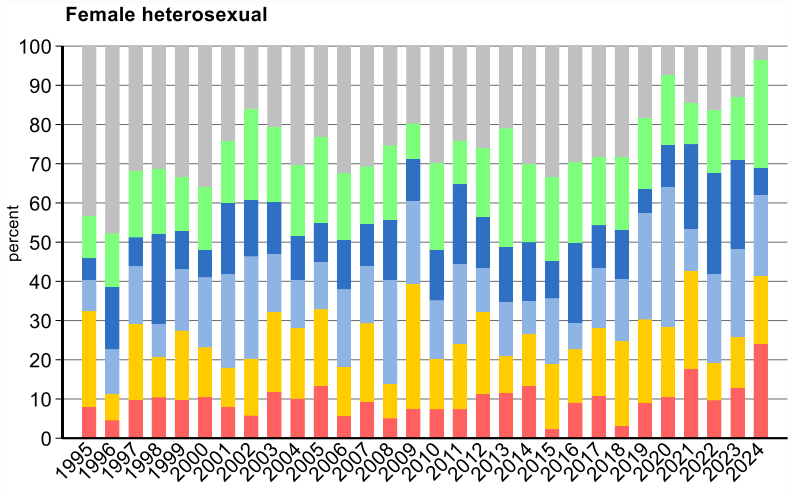
"Early" diagnosis or **„recent" infection** is defined as: acute HIV infection (westernblot pattern or antigen/HIV RNA combined with clinical presentation) or documented seroconversion with negative HIV test not more than 3 years before the first positive test.

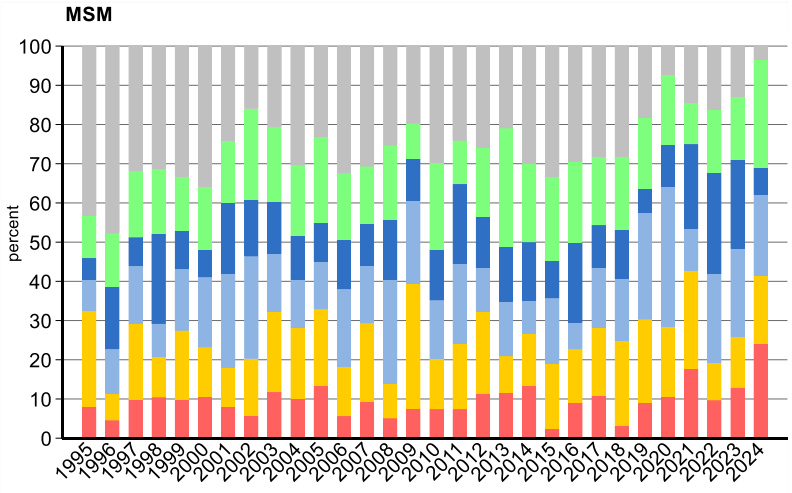
"Late" diagnosis is defined as: CD4 cell count below 350 at time of HIV diagnosis and/or AIDS within 3 months of HIV diagnosis

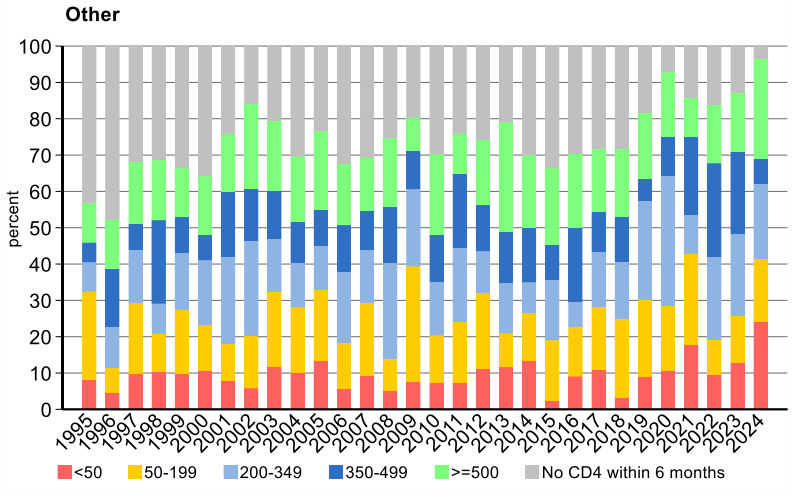
"Advanced" diagnosis is defined as: CD4 cell count below 200 at time of HIV diagnosis and/or AIDS within 3 months of HIV diagnosis


CD4 count at HIV-test
All
percent
<50
50-199
200-349
350-499
>=500
No CD4 within 6 months
Male IDU
percent
Female IDU
percent


Male heterosexual
percent
100
90
80
70
60
50
40
30
20
10
0
1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023 2024
<50
50-199
200-349
350-499
>=500
No CD4 within 6 months


Female heterosexual
percent
100
90
80
70
60
50
40
30
20
10
0
1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023 2024


MSM
percent
100
90
80
70
60
50
40
30
20
10
0
1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023 2024


Other
100
90
80
70
60
50
40
30
20
10
0
percent
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
<50
50-199
200-349
350-499
>=500
No CD4 within 6 months

6.1.2 Factors associated with an „early“ diagnosis in patients diagnosed since 2001

“Early” diagnosis or „recent“ infection is defined as: acute HIV infection (westernblot pattern or antigen/HIV RNA combined with clinical presentation) or documented seroconversion with negative HIV test not more than 3 years before the first positive test.

All centres	1229	7711	15.94%	**Univariable logistic Regression**			**Multivariable logistic Regression**		
	Frequencies		**%**	**OR**	**[95% CI]**	**p value**	**OR**	**[95% CI]**	**p value**
Demographic characteristics									
Age at time of HIV diagnosis									
< 30 years	499	2630	18.97%	1.88	[1.51,2.34]	<0.001	1.84	[1.45,2.33]	<0.001
30-50 years	618	4071	15.18%	1.43	[1.16,1.78]	0.001	1.36	[1.09,1.71]	0.007
≥ 50	112	1010	11.09%	1.00		.	1.00		.
HIV transmission category									
Male IDU	147	808	18.19%	0.80	[0.66,0.97]	0.026	0.78	[0.63,0.95]	0.016
Female IDU	67	260	25.77%	1.25	[0.94,1.67]	0.131	1.03	[0.76,1.40]	0.825
Male heterosexual	127	1385	9.17%	0.36	[0.30,0.44]	<0.001	0.41	[0.33,0.50]	<0.001
Female heterosexual	114	1280	8.91%	0.35	[0.29,0.43]	<0.001	0.40	[0.32,0.51]	<0.001
Other	20	510	3.92%	0.15	[0.09,0.23]	<0.001	0.17	[0.11,0.28]	<0.001
MSM	754	3468	21.74%	1.00		.	1.00		.
Federal state									
Carinthia	29	334	8.68%	0.57	[0.39,0.85]	0.005			
Upper Austria	127	705	18.01%	1.32	[1.06,1.64]	0.012			
Salzburg	83	401	20.70%	1.57	[1.21,2.04]	0.001			
Styria	90	645	13.95%	0.98	[0.76,1.24]	0.840			
Tyrol	156	523	29.83%	2.56	[2.07,3.16]	<0.001			
Other federal states	195	1094	17.82%	1.30	[1.08,1.57]	0.005			
Missing	0	8	0.00%	1.00	[1.00,1.00]	.			
Foreign countries	99	845	11.72%	0.80	[0.63,1.01]	0.057			
Vienna	450	3156	14.26%	1.00		.			
Population size of area of residence									
Missing value	7	112	6.25%	0.42	[0.19,0.90]	0.026	0.62	[0.28,1.35]	0.228
< 100 000	565	3149	17.94%	1.37	[1.20,1.56]	<0.001	1.69	[1.47,1.95]	<0.001
≥ 100 000	186	1035	17.97%	1.37	[1.14,1.65]	0.001	1.73	[1.42,2.10]	<0.001
> 1 million	471	3415	13.79%	1.00		.	1.00		.
Nationality									
Missing value	7	57	12.28%	0.56	[0.25,1.24]	0.154	0.67	[0.30,1.53]	0.343
Low prevalence countries	232	2095	11.07%	0.50	[0.43,0.58]	<0.001	0.51	[0.43,0.60]	<0.001
High prevalence countries	42	811	5.18%	0.22	[0.16,0.30]	<0.001	0.31	[0.22,0.44]	<0.001
Austria	948	4748	19.97%	1.00		.	1.00		.
Calendar period of HIV test									
2005-2008	262	1552	16.88%	0.99	[0.81,1.20]	0.907	0.96	[0.78,1.18]	0.686
2009-2012	300	1525	19.67%	1.19	[0.98,1.44]	0.072	1.08	[0.88,1.32]	0.473
2013-2016	201	1335	15.06%	0.86	[0.70,1.06]	0.163	0.77	[0.62,0.96]	0.021
2017-2020	152	1040	14.62%	0.83	[0.67,1.04]	0.110	0.72	[0.57,0.92]	0.007
≥ 2021	89	939	9.48%	0.51	[0.39,0.66]	<0.001	0.48	[0.37,0.63]	<0.001
2001-2004	225	1320	17.05%	1.00		.	1.00		.

6.1.3 Factors associated with a „late“ diagnosis in patients diagnosed since 2001

“Late” diagnosis is defined as: CD4 cell count below 350 at time of HIV diagnosis and/or AIDS within 3 months of HIV diagnosis

All centres	3240	7711	42.02%	**Univariable logistic Regression**			**Multivariable logistic Regression**		
	Frequencies		**%**	**OR**	**[95% CI]**	**p value**	**OR**	**[95% CI]**	**p value**
Demographic characteristics									
Age at time of HIV diagnosis									
< 30 years	800	2630	30.42%	0.30	[0.26,0.35]	<0.001	0.31	[0.27,0.37]	<0.001
30-50 years	1842	4071	45.25%	0.57	[0.50,0.65]	<0.001	0.60	[0.51,0.69]	<0.001
≥ 50	598	1010	59.21%	1.00		.	1.00		.
HIV transmission category									
Male IDU	337	808	41.71%	1.42	[1.22,1.66]	<0.001	1.54	[1.31,1.82]	<0.001
Female IDU	69	260	26.54%	0.72	[0.54,0.95]	0.022	0.88	[0.66,1.18]	0.382
Male heterosexual	768	1385	55.45%	2.47	[2.18,2.81]	<0.001	1.98	[1.73,2.27]	<0.001
Female heterosexual	653	1280	51.02%	2.07	[1.82,2.36]	<0.001	1.90	[1.65,2.19]	<0.001
Other	252	510	49.41%	1.94	[1.61,2.34]	<0.001	1.74	[1.43,2.12]	<0.001
MSM	1161	3468	33.48%	1.00		.	1.00		.
Federal state									
Carinthia	158	334	47.31%	1.29	[1.03,1.62]	0.027			
Upper Austria	317	705	44.96%	1.17	[1.00,1.38]	0.056			
Salzburg	157	401	39.15%	0.92	[0.75,1.14]	0.470			
Styria	286	645	44.34%	1.14	[0.97,1.36]	0.121			
Tyrol	196	523	37.48%	0.86	[0.71,1.04]	0.125			
Other federal states	490	1094	44.79%	1.17	[1.01,1.34]	0.030			
Missing	2	8	25.00%	0.48	[0.10,2.38]	0.368			
Foreign countries	339	845	40.12%	0.96	[0.82,1.12]	0.631			
Vienna	1295	3156	41.03%	1.00		.			
Population size of area of residence									
Missing value	37	112	33.04%	0.71	[0.48,1.06]	0.092	0.66	[0.44,1.00]	0.050
< 100 000	1388	3149	44.08%	1.13	[1.03,1.25]	0.012	1.00	[0.90,1.11]	0.975
≥ 100 000	414	1035	40.00%	0.96	[0.83,1.10]	0.557	0.87	[0.75,1.01]	0.061
> 1 million	1401	3415	41.02%	1.00		.	1.00		.
Nationality									
Missing/Unknown	19	57	33.33%	0.71	[0.41,1.24]	0.233	0.68	[0.38,1.21]	0.194
Low prevalence countries	810	2095	38.66%	0.90	[0.81,1.00]	0.049	0.98	[0.87,1.09]	0.701
High prevalence countries	455	811	56.10%	1.82	[1.57,2.12]	<0.001	1.60	[1.35,1.89]	<0.001
Austria	1956	4748	41.20%	1.00		.	1.00		.
Calendar period of HIV test									
2005-2008	666	1552	42.91%	1.01	[0.87,1.17]	0.920	1.02	[0.88,1.19]	0.777
2009-2012	626	1525	41.05%	0.93	[0.80,1.08]	0.366	0.99	[0.84,1.15]	0.874
2013-2016	529	1335	39.63%	0.88	[0.75,1.03]	0.104	0.93	[0.79,1.09]	0.362
2017-2020	414	1040	39.81%	0.89	[0.75,1.05]	0.153	0.92	[0.77,1.09]	0.340
≥ 2021	441	939	46.96%	1.19	[1.00,1.40]	0.046	1.14	[0.95,1.36]	0.165
2001-2004	564	1320	42.73%	1.00		.	1.00		.

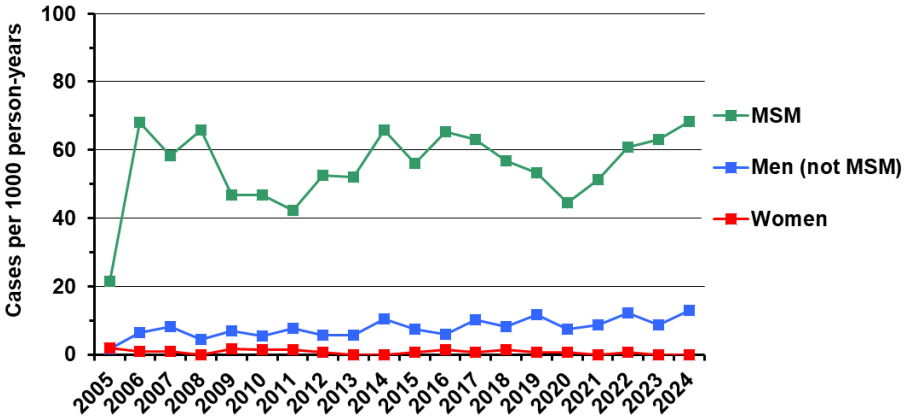
7 Co-infections

7.1 Syphilis

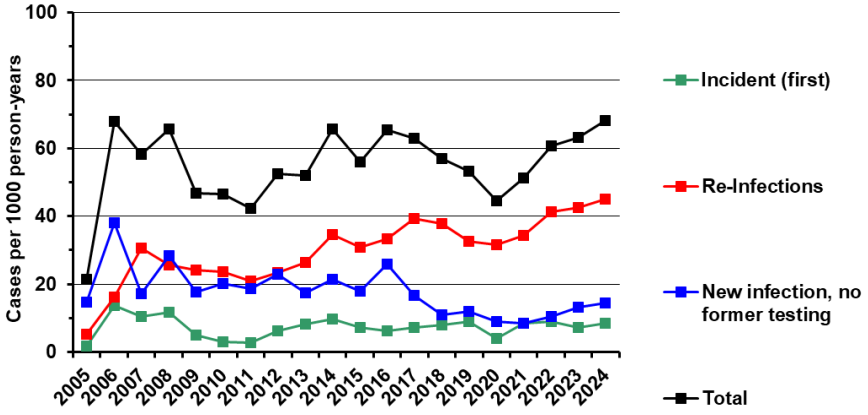
Syphilis can persist for several years when it is not treated, and reinfection with syphilis is possible because there is no protective immunity.
Until 2018 distinct diagnoses of syphilis have been used to define prevalence and incidence of syphilis. However, this approach has shortcomings (heterogenous use of definitions of diagnosis, e.g. also documentation of several bouts as one diagnosis) so that future analysis has to be based on serology. Repeated syphilis episodes as a reported positive nontreponemal and treponemal test following a syphilis episode and subsequent ≥4-fold titer reduction or negativity in nontreponemal testing and a consecutive ≥4-fold titer increase with a titer value of at least 8 in nontreponemal testing. This transformation will be introduced in summer 2024.

7.1.1 „Recent“ syphilis infections

This analysis only includes new “recent” syphilis infections defined as follows: patients with a former syphilis result that was either negative or a status post treatment and who now presented with active syphilis (= new „recent“ syphilis infections).

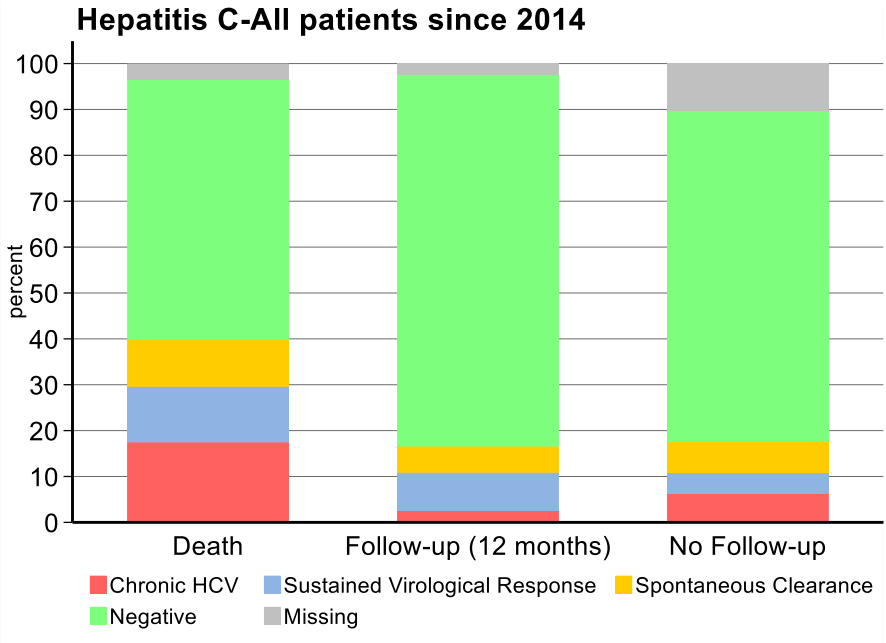


7.1.2 Syphilis in MSM



7.2 Hepatitis C

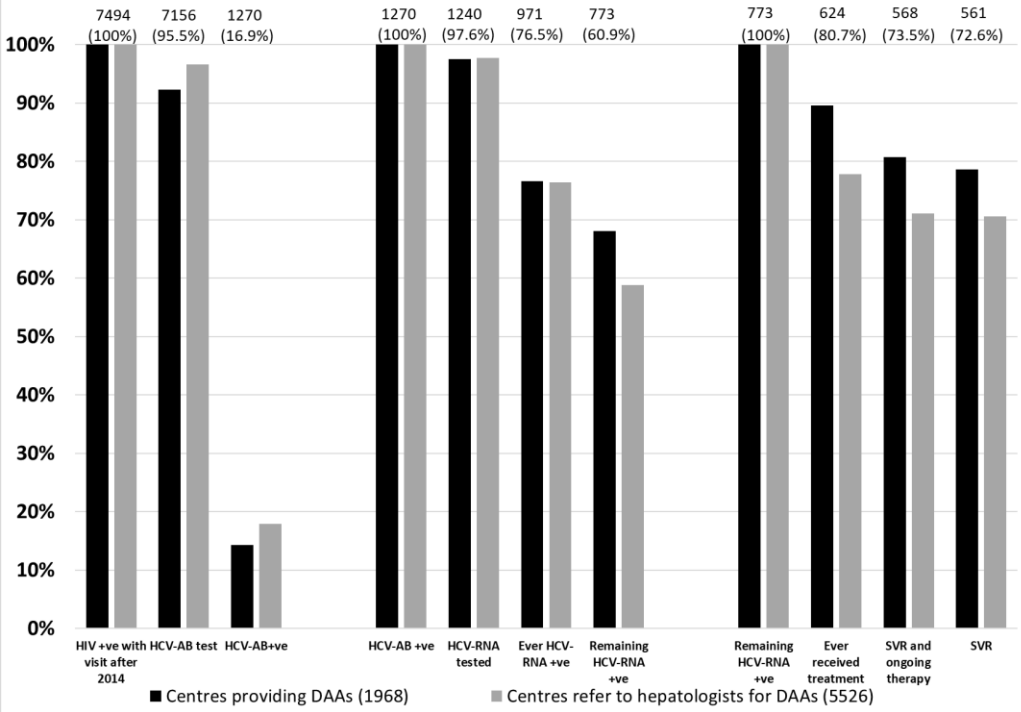
HCV co-infection was defined by a positive result on a qualitative or quantitative RNA test result.



7.2.1 Cascade of Care in patients seen since January 1st 2014 and alive after January 1st 2025

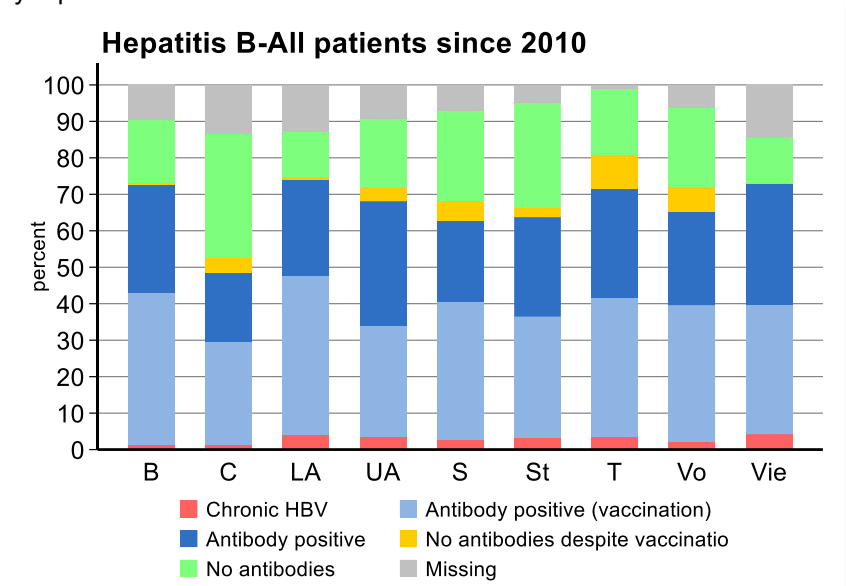
Stage	Definition
Stage1: anti-HCV +ve	Either anti-HCV positive test, HCV-RNA positive test, HCV genotyped or received HCV treatment before index date
Stage 2: HCV-RNA tested	Either HCV-RNA tested, HCV genotyped or received HCV treatment before index date
Stage 3: Ever HCV-RNA +ve	Either HCV-RNA positive test, received HCV treatment or HCV genotyped before index date
Stage 4: Remaining HCV-RNA +ve	HCV-RNA ever positive and no spontaneous clearance
Stage 5: Ever received treatment	Started HCV treatment on or before index date
Stage 6: Cured (SVR) and ongoing therapy	HCV-RNA test after completing treatment (HCV-RNA test data included for duration of FU to allow for assessment of SVR); Ongoing therapy if still on treatment or end of therapy less than 12 weeks before 01.09.2025
Stage 8: Cured (SVR)	HCV-RNA negative test at least 12 or 24 weeks post-treatment (for IFN-free and IFN-based therapy, respectively)

Figure: The Hepatitis C continuum of care among HIV infected individuals in Austria



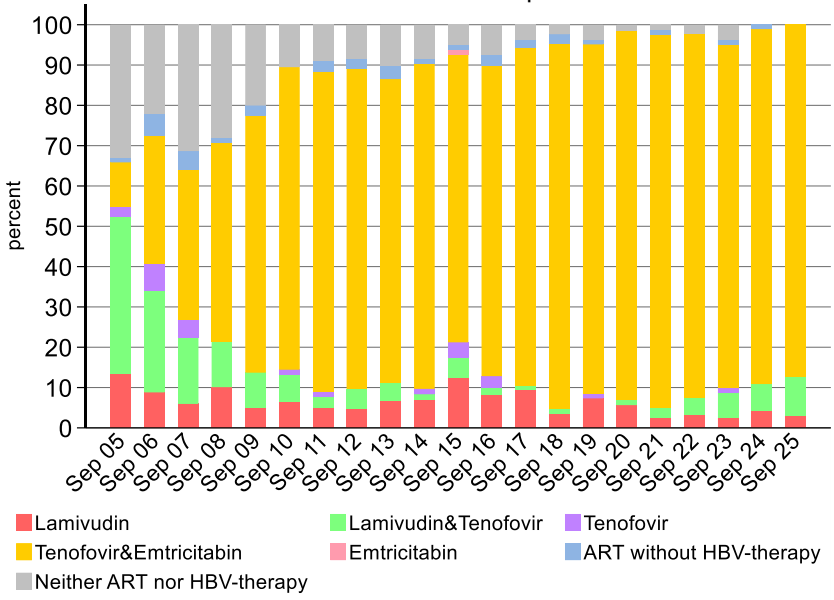
7.3 Hepatitis B in patients seen since January 1st 2010

Chronic HBV was defined by a positive result on a hepatitis B surface antigen (HBsAg) test or by a positive HBV DNA test result.



Therapy for hepatitis B (patients currently in care)

Current guidelines recommend the use of tenofovir and emtricitabine or tenofovir and lamivudine as the NRTI-backbones in cART combinations for HBV-HIV co-infected patients. Most of the HBV-HIV co-infected patients in care at one of the Austrian HIV treatment centres received an NRTI-backbone to help control the HBV infection.



8 Transmission of drug resistant HIV (data: 03/2025)

8.1 Abstract

Prevalence of Transmitted Drug Resistance is Stabilising at a Low Rate in Austria

Objective: To determine the prevalence of transmitted drug resistance (TDR), temporal trends in resistance, and predictors for TDR.
Method: Newly diagnosed patients from 2003 to December 2024 from nine centres were analyzed. Mutations were judged as resistant according to Bennett et al. (WHO 2009 mutation list). For patients with acute or recent infection the year of infection was obtained by the date of primary HIV infection or the median point in time between negative and positive HIV test. For patients with chronic infection the rate of resistance was plotted against the year of the HIV diagnosis.
Results: Overall 4083 of 6920 patients had an amplifiable resistance test. The overall prevalence of TDR was 7.0 (285 of 4083 patients; 95% CI: 6.3%-7.8%). The prevalence of NRTI resistance was 2.9% (2.4%-3.5%), the prevalence of NNRTI resistance was 2.9% (2.4%-3.5%), and the prevalence of PI resistance was 1.7% (1.3%-2.1%). The relative risk of TDR in men who have sex with men compared to heterosexual contacts was 1.4 (95% CI: 1.1-1.9). The prevalence rate of TDR in the 1182 patients with acute/recent infection was 7.5% (65 of 868 patients; 5.9%-9.4%). One patient (0.1%) showed TDR against 3 drug classes (K70R; K103N; L90M). The prevalence rate of TDR in the 5714 patients with chronic infection was 6.8% (220 of 3215 patients; 6.0%-7.8%).
Conclusions: The prevalence of TDR among newly diagnosed patients was found to be stabilizing. No difficult to treat cases of TDR has been observed.

8.2 Introduction

Number of cohort participants:
Only patients with HIV diagnosis between 2003-2024 have been analyzed because extensive documentation of resistance testing started at this time.

HIV test	OWS Vienna	AKH Vienna	KFJ Vienna	Linz	Salz-burg	Inns-bruck	Feld-kirch	Graz	Klagen-furt	Total
until 2003	1574	1198	43	613	124	820	19	240	67	**4698**
2003-2024	1251	2299	299	727	493	743	165	652	291	**6920**

The rate of transmission of drug resistant HIV („percent with resistance“) corresponds to the number of patients with resistance mutations in relation to the number of patients with a genotypic resistance test before antiretroviral therapy. For this, the genomes of the reverse transcriptase (RT) and the protease (P) were sequenced. The resistance mutations have been classified according to Bennett DE et al. Drug resistance mutations for surveillance of transmitted HIV-1 drug-resistance: 2009 update. PLoS One 2009;4(3):e4724.
Patients were either analysed according to the time of the infection („recent infection“), or, if this was not known, patients were analysed according to the year of the HIV diagnosis.

The following codons and amino acids were classified as resistance:

Reverse Transkriptase				Protease	
NRTI		NNRTI			
M41	L	L100	I	L23	I
K65	R	K101	E, P	L24	I
D67	N, G, E	K103	N, S	D30	N
T69	D, ins	V106	M, A	V32	I
K70	R, E	V179	F	M46	I, L
L74	V, I	Y181	C, I, V	I47	V, A
V75	T, M, A, S	Y188	L, H, C	G48	V, M
F77	L	G190	A, S, E	I50	V, L
Y115	F	P225	H	F53	L, Y
F116	Y	M230	L	I54	V, L, M, A, T, S
Q151	M			G73	S, T, C, A
M184	V, I			L76	V
L210	W			V82	A, T, F, S, C, M, L
T215	Y, F, I, S, C, D, V, E			N83	D
K219	Q, E, N, R			I84	V, A, C
				I85	V
				N88	D, S
				L90	M

8.3 Number of patients with “recent”or chronic HIV infection

	Number of HIV diagnoses	"Recent" infections	Unknown time of infection
Year	**Year of HIV diagnosis**	**Year of HIV infection**	**Year of HIV diagnosis**
2001	-	2	-
2002	-	22	-
2003	316	61	264
2004	365	64	293
2005	369	77	300
2006	366	57	304
2007	394	85	321
2008	421	66	341
2009	360	67	294
2010	386	98	300
2011	379	100	275
2012	392	64	319
2013	333	65	259
2014	326	46	274
2015	346	49	309
2016	321	54	269
2017	337	52	269
2018	236	44	198
2019	268	30	234
2020	183	27	161
2021	205	19	180
2022	207	25	182
2023	206	23	177
2024	204	9	191
Total	**6920**	**1206**	**5714**

8.4 „Recent" infection (time of infection known or estimated)

„Recent" infection means:

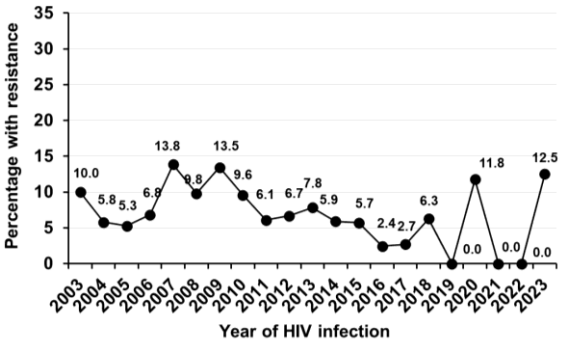
- Acute HIV infection (westernblot pattern or antigen/HIV RNA with clinical symptoms)
- Documented seroconversion with a negative HIV test not more than 3 years before the first positive test

Calculation of the time of infection (year of the HIV infection):

- Time point of the acute HIV infection or
- Midpoint between last negative and first positive HIV test

	Number of "recent" HIV infections	Available resistance tests before ART	Any resistance
Year of "recent" HIV infection			
2003	61	50	5
2004	64	52	3
2005	77	57	3
2006	57	44	3
2007	85	65	9
2008	66	51	5
2009	67	52	7
2010	98	73	7
2011	100	82	5
2012	64	45	3
2013	65	51	4
2014	46	34	2
2015	49	35	2
2016	54	41	1
2017	52	37	1
2018	44	32	2
2019	30	15	-
2020	27	17	2
2021	19	11	-
2022	25	12	-
2023	23	8	1
2024	9	4	-
Sex/ mode of transmission			
MSM	767	569	50
Male IDU	120	83	3
Female IDU	48	30	3
Male heterosexual	120	90	6
Female heterosexual	104	84	3
Other	23	12	-
Total	**1182**	**868**	**65**

Overall rate of transmitted drug resistance in recent infection was 7.5% (65 of 868).



The year 2024 is not shown in the graph, as because of the definition of recent infection only a limited number of patients can be defined.

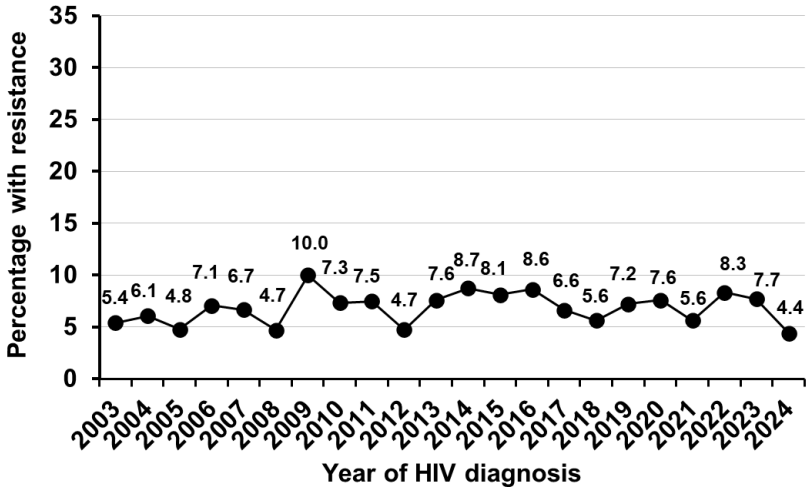
Transmission of drug resistant HIV according to the time of the "recent" HIV infection, residence, mode of transmission, sex, age
"Recent" infections

	Number of HIV infections	Available resistance tests	Wild type	Resistance to: Any resistance	NRTI	NNRTI	PI	NRTI and PI	NRTI and NNRTI	NNRTI and PI	3-class-resistance
Year of HIV infection											
2003	61	50	45	5	4	1	-	-	-	-	-
2004	64	52	49	3	-	3	-	-	-	-	-
2005	77	57	54	3	1	2	-	-	-	-	-
2006	57	44	41	3	1	2	-	-	-	-	-
2007	85	65	56	9	4	4	3	1	2	1	1
2008	66	51	46	5	3	1	3	1	-	-	-
2009	67	52	45	7	2	3	4	1	-	1	-
2010	98	73	66	7	1	5	1	-	-	-	-
2011	100	82	77	5	1	4	1	-	-	1	-
2012	64	45	42	3	3	-	-	-	-	-	-
2013	65	51	47	4	1	2	1	-	-	-	-
2014	46	34	32	2	2	-	-	-	-	-	-
2015	49	35	33	2	1	1	-	-	-	-	-
2016	54	41	40	1	-	1	-	-	-	-	-
2017	52	37	36	1	-	-	1	-	-	-	-
2018	44	32	30	2	-	1	1	-	-	-	-
2019	30	15	15	-	-	-	-	-	-	-	-
2020	27	17	15	2	-	2	-	-	-	-	-
2021	19	11	11	-	-	-	-	-	-	-	-
2022	25	12	12	-	-	-	-	-	-	-	-
2023	23	8	7	1	-	1	-	-	-	-	-
2024	9	4	4	-	-	-	-	-	-	-	-
Population size of area of residence											
Rural areas	530	401	372	29	11	16	6	1	1	3	1
Capital cities	183	144	131	13	3	5	6	1	-	-	-
Vienna	463	321	298	23	10	12	3	1	1	-	-
Missing value	6	2	2	-	-	-	-	-	-	-	-
Sex/ mode of transmission											
MSM	767	569	519	50	18	25	14	3	2	3	1
Male IDU	120	83	80	3	2	1	-	-	-	-	-
Female IDU	48	30	27	3	-	3	-	-	-	-	-
Male heterosexual	120	90	84	6	2	3	1	-	-	-	-
Female heterosexual	104	84	81	3	2	1	-	-	-	-	-
Others	23	12	12	-	-	-	-	-	-	-	-
Age at time of HIV-test											
< 35 years	681	488	442	46	16	25	8	1	1	1	-
≥ 35 years	501	380	361	19	8	8	7	2	1	2	1
Total	**1182**	**868**	**803**	**65**	**24**	**33**	**15**	**3**	**2**	**3**	**1**

Younger patients (<35 years) had a higher risk for transmitted resistance (OR=2.1, 95% CI: 1.2-3.8).

8.5 Unknown time of infection (not "recent")

	Number of HIV diagnoses	Available resistance tests before ART	Any resistance
Year of HIV diagnosis			
2003	264	148	8
2004	293	181	11
2005	300	188	9
2006	304	184	13
2007	321	195	13
2008	341	191	9
2009	294	190	19
2010	300	191	14
2011	275	174	13
2012	319	190	9
2013	259	158	12
2014	274	149	13
2015	309	173	14
2016	269	162	14
2017	269	151	10
2018	198	107	6
2019	234	111	8
2020	161	66	5
2021	180	89	5
2022	182	84	7
2023	177	65	5
2024	191	68	3
Mode of transmission			
MSM	2445	1414	116
Male IDU	559	326	12
Female IDU	165	89	6
Male heterosexual	1098	652	31
Female heterosexual	1038	596	43
Other	409	138	12
Total	**5714**	**3215**	**220**



Transmission of drug resistant HIV according to the time of the HIV diagnosis, residence, mode of transmission, gender and age
Not-"recent" infections

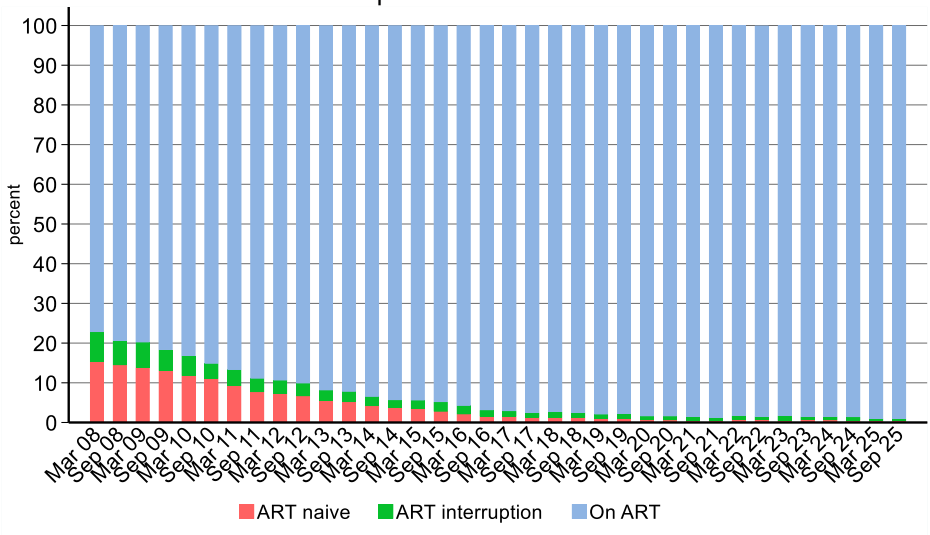
	Number of HIV diagnoses	Available resistance tests	Wild type	Any resistance	Resistance to NRTI	NNRTI	PI	NRTI and PI	NRTI and NNRTI	NNRTI and PI	3-class-resistance
Year of HIV diagnosis											
2003	264	148	140	8	4	3	1	-	-	-	-
2004	293	181	170	11	6	2	4	1	-	-	-
2005	300	188	179	9	7	1	4	3	-	-	-
2006	304	184	171	13	6	2	5	-	-	-	-
2007	321	195	182	13	8	2	3	-	-	-	-
2008	341	191	182	9	4	2	3	-	-	-	-
2009	294	190	171	19	7	4	9	-	1	-	-
2010	300	191	177	14	4	7	4	1	-	-	-
2011	275	174	161	13	3	6	4	-	-	-	-
2012	319	190	181	9	7	2	1	-	1	-	-
2013	259	158	146	12	7	5	-	-	-	-	-
2014	274	149	136	13	3	6	4	-	-	-	-
2015	309	173	159	14	5	6	4	-	-	1	-
2016	269	162	148	14	3	10	1	-	-	-	-
2017	269	151	141	10	4	6	-	-	-	-	-
2018	198	107	101	6	4	1	2	1	-	-	-
2019	234	111	103	8	2	5	1	-	-	-	-
2020	161	66	61	5	2	4	-	-	1	-	-
2021	180	89	84	5	2	3	-	-	-	-	-
2022	182	84	77	7	1	4	2	-	-	-	-
2023	177	65	60	5	4	4	1	1	3	1	1
2024	191	68	65	3	2	1	-	-	-	-	-
Population size of area of residence											
Rural areas	2294	1326	1230	96	42	34	21	-	1	-	-
Capital cities	761	513	475	38	12	21	9	-	4	-	-
Vienna	2577	1358	1275	83	40	30	22	7	1	2	1
Missing value	82	18	15	3	1	1	1	-	-	-	-
Sex/ mode of transmission											
MSM	2445	1414	1298	116	46	46	29	3	-	2	1
Male IDU	559	326	314	12	4	8	1	-	1	-	-
Female IDU	165	89	83	6	2	3	1	-	1	-	-
Male heterosexual	1098	652	621	31	14	9	10	1	1	-	-
Female heterosexual	1038	596	553	43	25	14	10	3	3	-	-
Others	409	138	126	12	4	6	2	-	-	-	-
Age at time of HIV-test											
< 35 years	2840	1489	1375	114	50	48	26	7	3	1	1
≥ 35 years	2874	1726	1620	106	45	38	27	-	3	1	-
Total	**5714**	**3215**	**2995**	**220**	**95**	**86**	**53**	**7**	**6**	**2**	**1**

Men who had been infected through intravenous drug use (OR=0.4, 95% CI: 0.2-0.8) or heterosexually (OR=0.6, 95% CI: 0.4-0.9) had a lower risk of transmitted resistance, younger patients (<35 years) had a slightly higher risk (OR=1.4, 95 %-CI: 1.04–1.9).

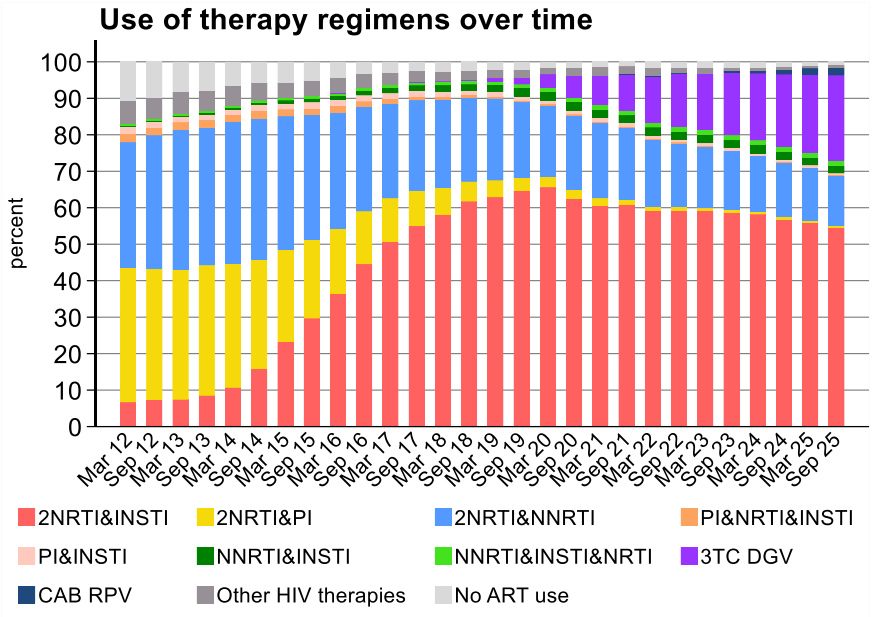
9 Antiretroviral therapy (ART)

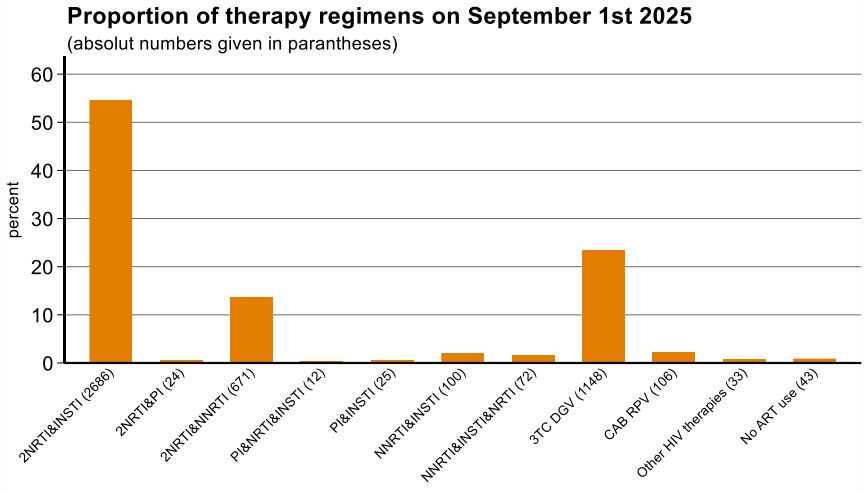
9.1 Patients currently in care regarding treatment status

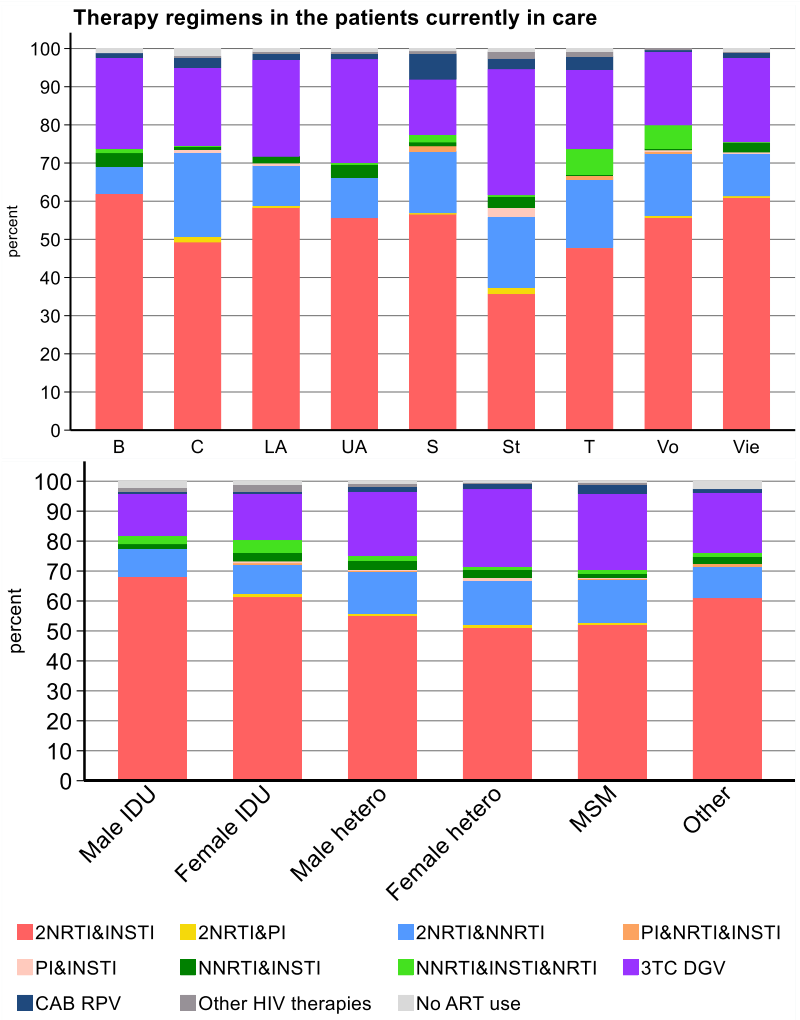
Overall, 4920 persons were currently in care at a hospital-based HIV treatment centre (currently in care, those who had a visit within the last 6 months). On September 1st, 2025, 4877 (99.1%) patients were on antiretroviral therapy in the 9 HIV treatment centres. Of the 43 patients not on treatment on September 1st, 2025, 21 had received antiretroviral treatment at an earlier point in time.



9.2 Regimens of antiretroviral therapy

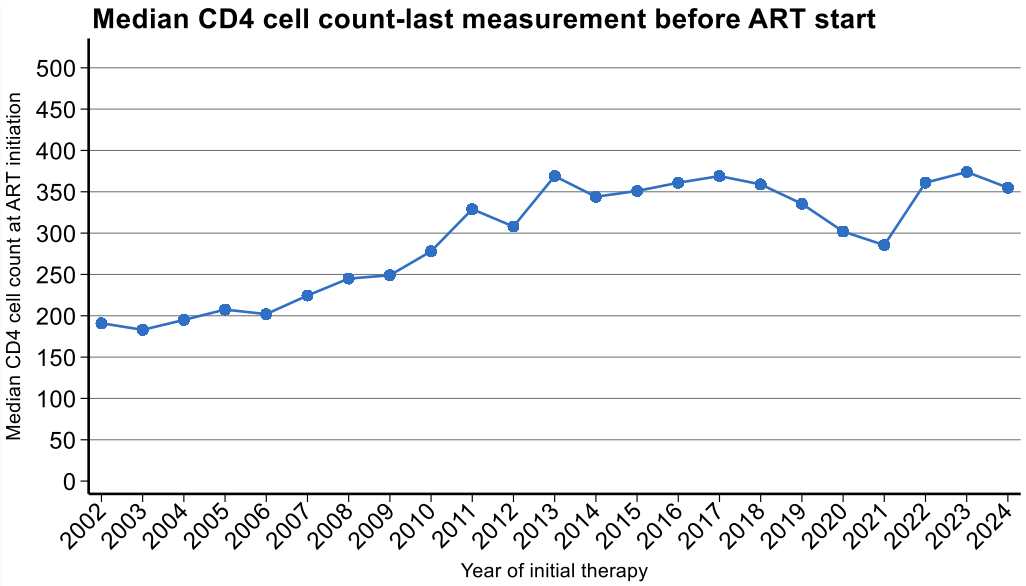



Proportion of therapy regimens on September 1st 2025
(absolut numbers given in parantheses)
percent
0
10
20
30
40
50
60
2NRTI&INSTI (2686)
2NRTI&PI (24)
2NRTI&NNRTI (671)
PI&NRTI&INSTI (12)
PI&INSTI (25)
NNRTI&INSTI (100)
NNRTI&INSTI&NRTI (72)
3TC DGV (1148)
CAB RPV (106)
Other HIV therapies (33)
No ART use (43)

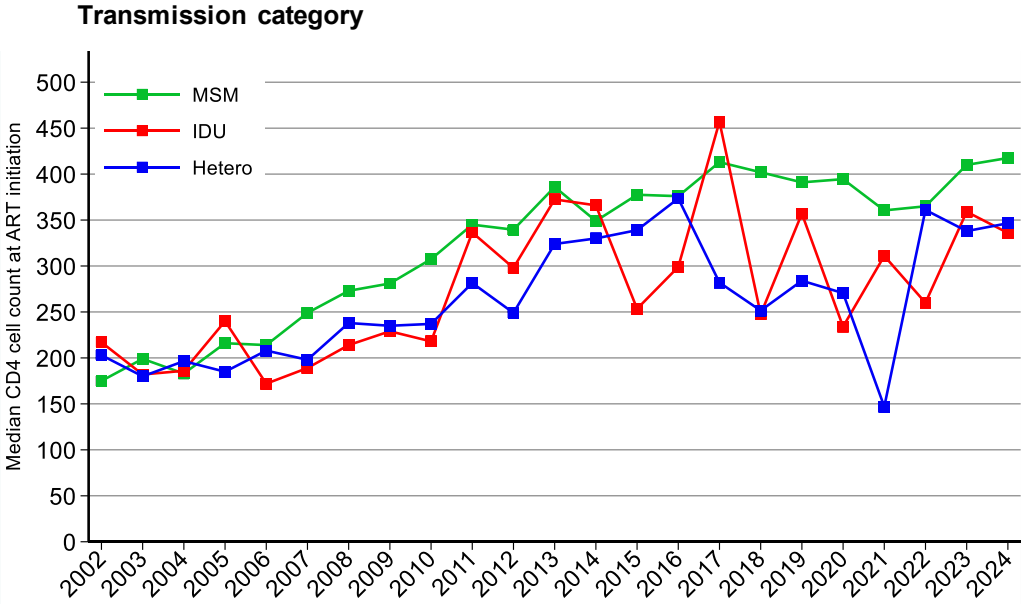

Therapy regimens in the patients currently in care
percent
0
10
20
30
40
50
60
70
80
90
100
B
C
LA
UA
S
St
T
Vo
Vie
Male IDU
Female IDU
Male hetero
Female hetero
MSM
Other
2NRTI&INSTI
2NRTI&PI
2NRTI&NNRTI
PI&NRTI&INSTI
PI&INSTI
NNRTI&INSTI
NNRTI&INSTI&NRTI
3TC DGV
CAB RPV
Other HIV therapies
No ART use

9.3 CD4 cell counts at initiation of ART

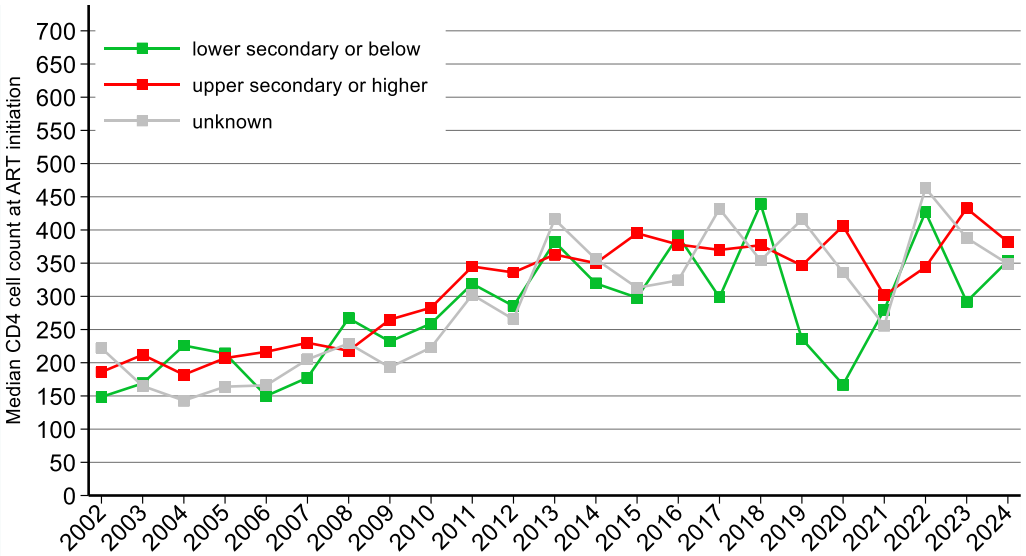
9.3.1 CD4 cell counts at initiation of ART



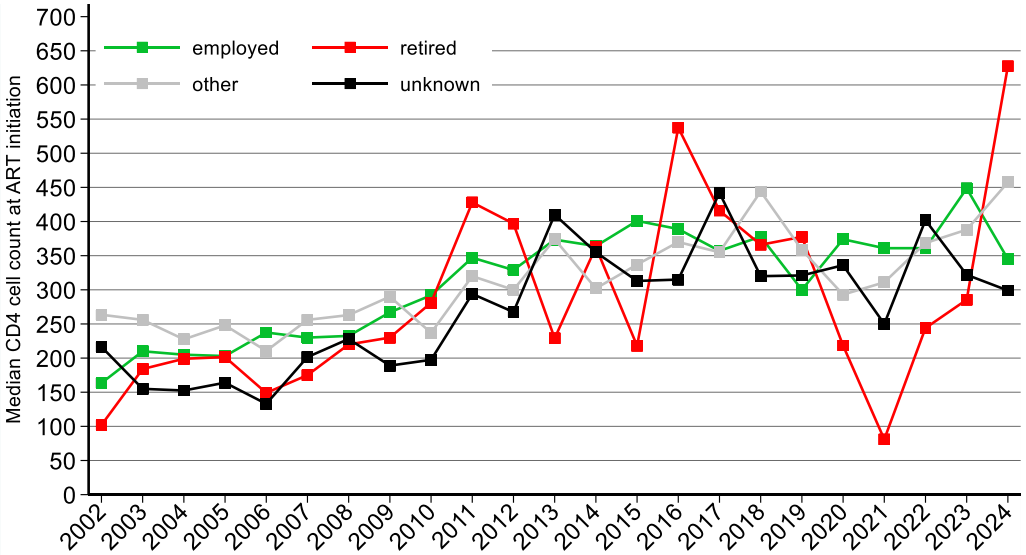
9.3.2 Median CD4 count at ART initiation



Level of education

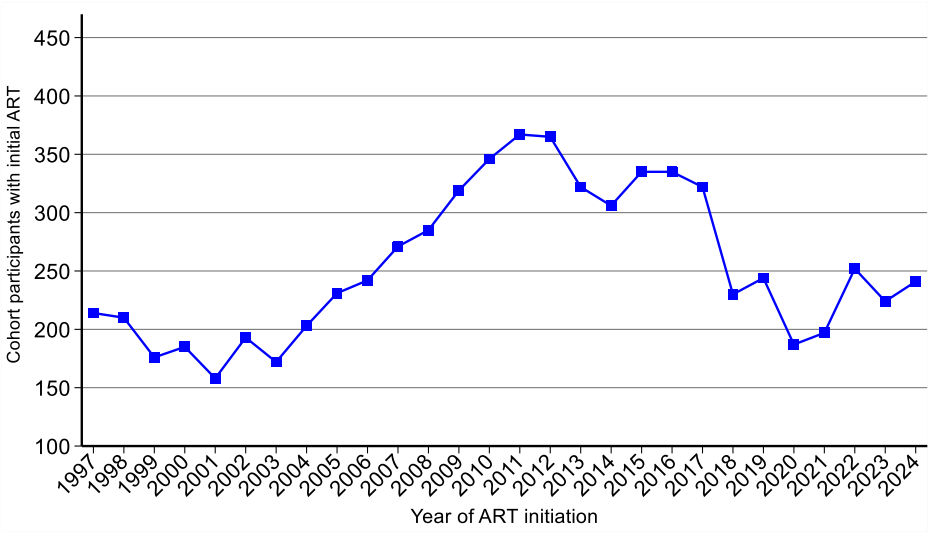


Status of employment



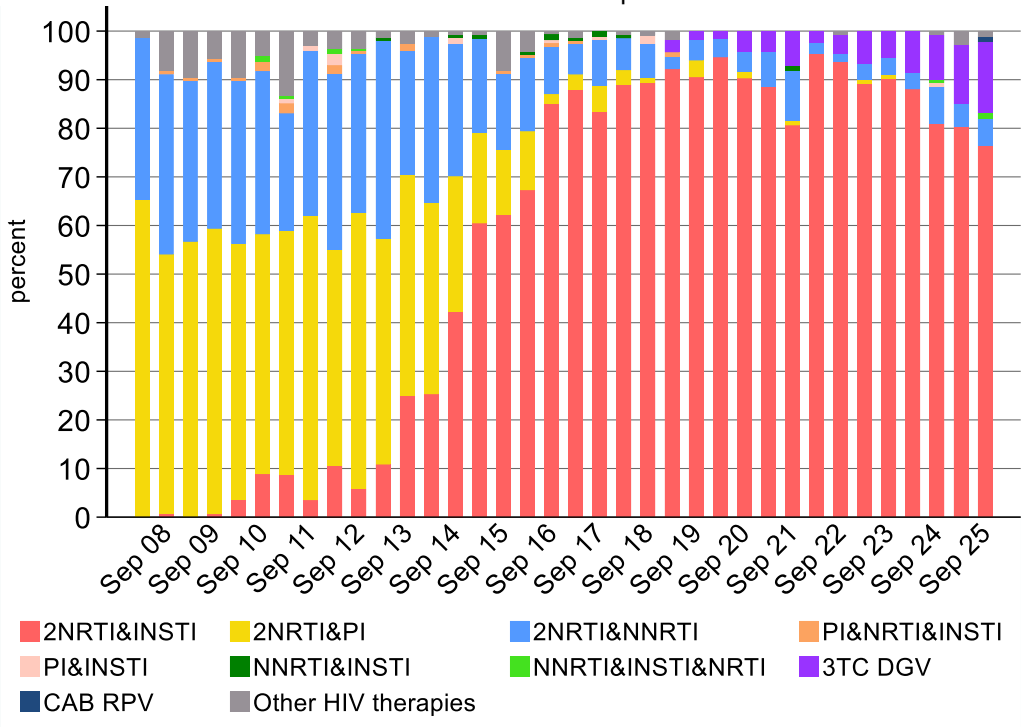
9.4 Initial therapy

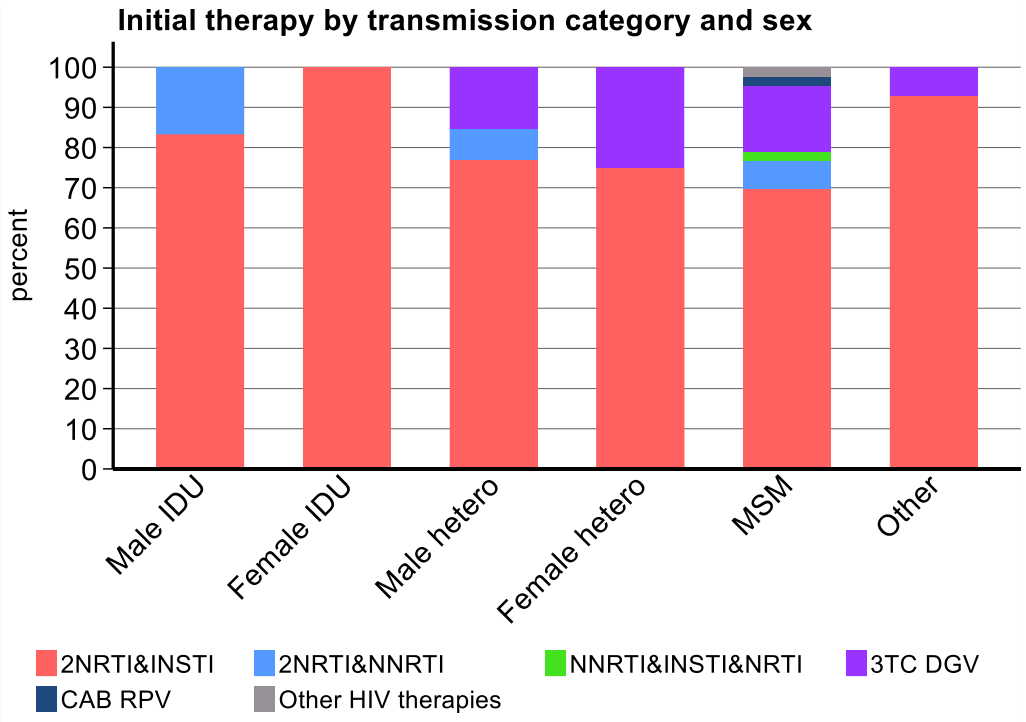
9.4.1 Number of persons who started ART in the respective year



9.4.2 Regimens of the initial therapy

After March 1st, 2025, 89 patients started antiretroviral therapy. 84 of them also had their first measurement of CD4 cell count within this period.




Initial therapy by transmission category and sex
percent
100
90
80
70
60
50
40
30
20
10
0
Male IDU
Female IDU
Male hetero
Female hetero
MSM
Other
2NRTI&INSTI
2NRTI&NNRTI
NNRTI&INSTI&NRTI
3TC DGV
CAB RPV
Other HIV therapies

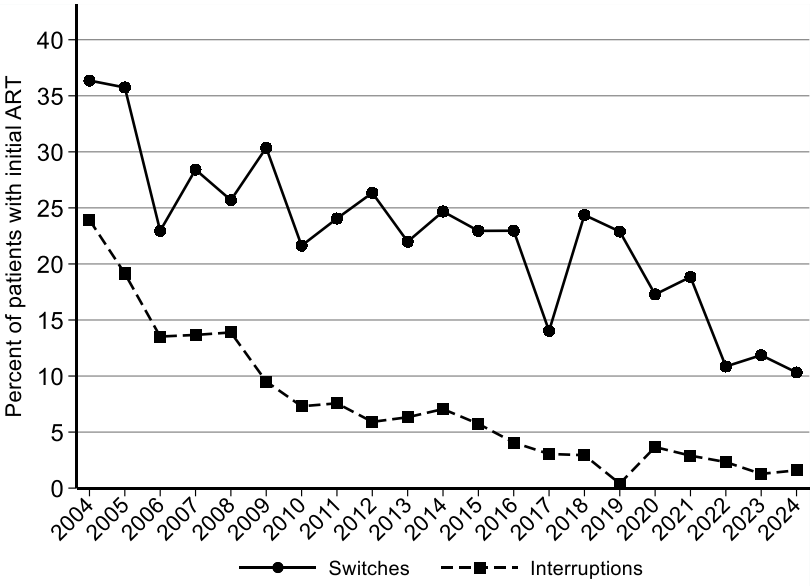
9.5 ART switches and interruptions

9.5.1 Switches and interruptions of ART during the first year of treatment

9.5.1.1 All switches, excluding switches from TDF to TAF containing regimens

Percentage of patients with ART switches and interruptions during the first year of treatment

Year of ART initiation	% of patients with ART switches	% of patients with ART interruptions
2004	36.4	23.9
2005	35.7	19.1
2006	23.0	13.5
2007	28.4	13.7
2008	25.7	13.9
2009	30.4	9.5
2010	21.6	7.3
2011	24.1	7.6
2012	26.3	5.9
2013	22.0	6.3
2014	24.7	7.1
2015	23.0	5.7
2016	23.0	4.1
2017	14.0	3.0
2018	24.4	2.9
2019	22.9	0.4
2020	17.3	3.7
2021	18.8	2.9
2022	10.9	2.3
2023	11.9	1.3
2024	10.3	1.6

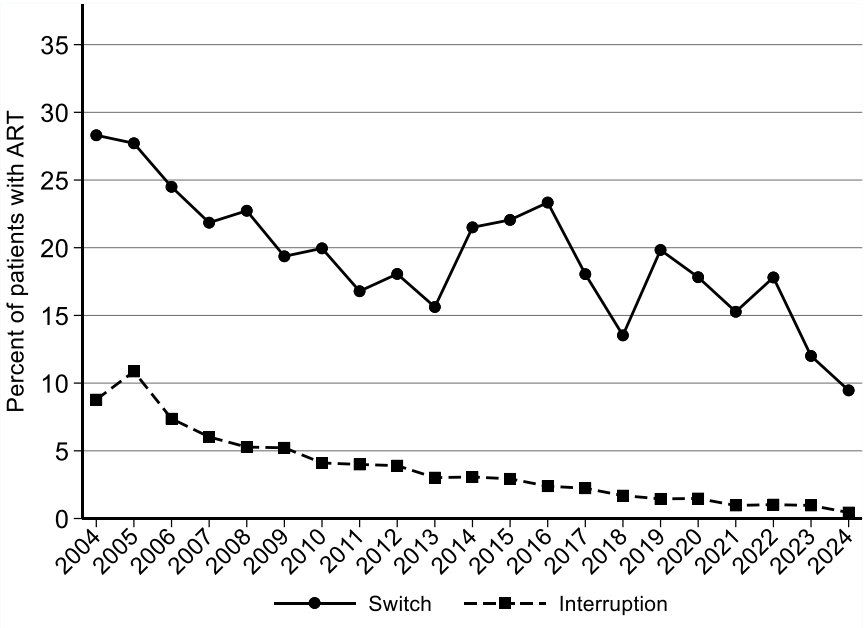


9.5.2 ART switches and interruptions per calendar year

9.5.2.1 All switches, excluding switches from TDF to TAF containing regimens

Percentage of patients with ART switches and interruptions in the respective year

Year of ART initiation	% of patients with ART switches	% of patients with ART interruptions
2004	28.3	8.8
2005	27.7	10.9
2006	24.5	7.4
2007	21.9	6.0
2008	22.7	5.3
2009	19.4	5.2
2010	20.0	4.1
2011	16.8	4.0
2012	18.1	3.9
2013	15.6	3.0
2014	21.5	3.1
2015	22.1	2.9
2016	23.3	2.4
2017	18.0	2.2
2018	13.5	1.7
2019	19.8	1.5
2020	17.8	1.5
2021	15.3	1.0
2022	17.8	1.0
2023	12.0	1.0
2024	9.5	0.4



9.5.4 Risk factors for treatment switches during the first year of treatment, excluding switches from TDF to TAF containing regimens

	Switch	All		Univariable logistic regression			Multivariable logistic regression		
	1360	5991	22.70%	OR	[95% CI]	p value	OR	[95% CI]	p value
HIV transmission category									
Male IDU	133	638	20.85%	1.03	[0.83,1.28]	0.776	0.91	[0.73,1.14]	0.408
Female IDU	43	226	19.03%	0.92	[0.65,1.30]	0.637	0.83	[0.59,1.19]	0.317
Male heterosexual	243	1088	22.33%	1.13	[0.95,1.34]	0.172	0.95	[0.80,1.14]	0.605
Female heterosexual	309	1001	30.87%	1.75	[1.48,2.06]	<0.001	1.60	[1.35,1.89]	<0.001
Other	82	334	24.55%	1.27	[0.98,1.66]	0.074	1.25	[0.95,1.65]	0.112
MSM	550	2704	20.34%	1.00		.	1.00		.
Age at baseline									
< 30 years	317	1456	21.77%	0.84	[0.69,1.01]	0.068	0.84	[0.69,1.03]	0.089
30-50 years	791	3524	22.45%	0.87	[0.74,1.03]	0.099	0.85	[0.71,1.00]	0.053
≥ 50	252	1011	24.93%	1.00		.	1.00		.
AIDS at baseline									
Yes	299	893	33.48%	1.92	[1.64,2.24]	<0.001			
No	1061	5098	20.81%	1.00		.			
CD4 count at baseline									
< 50	215	669	32.14%	2.16	[1.78,2.63]	<0.001	1.98	[1.62,2.44]	<0.001
50-199	307	1143	26.86%	1.67	[1.41,1.99]	<0.001	1.48	[1.24,1.78]	<0.001
200-349	314	1492	21.05%	1.22	[1.03,1.44]	0.021	1.07	[0.90,1.27]	0.460
Missing	137	535	25.61%	1.57	[1.26,1.96]	<0.001	1.66	[1.32,2.08]	<0.001
≥ 350	387	2152	17.98%	1.00		.	1.00		.
HIV-RNA at baseline									
10.000-99.999	391	2027	19.29%	0.89	[0.74,1.07]	0.229			
≥ 100.000	544	2134	25.49%	1.28	[1.07,1.53]	0.006			
Missing	201	769	26.14%	1.32	[1.06,1.64]	0.012			
≤ 9.999	224	1061	21.11%	1.00		.			
Nationality									
High prevalence countries	206	741	27.80%	1.37	[1.15,1.63]	<0.001			
Low prevalence countries	1154	5250	21.98%	1.00		.			
Population size of area of residence									
Rural areas	556	2444	22.75%	1.08	[0.95,1.23]	0.238	1.11	[0.96,1.27]	0.148
Capital cities	221	821	26.92%	1.35	[1.13,1.62]	0.001	1.43	[1.19,1.73]	<0.001
Vienna	583	2726	21.39%	1.00		.	1.00		.
Year of ART Initiation									
2004-2007	295	966	30.54%	2.83	[2.27,3.52]	<0.001	2.79	[2.22,3.50]	<0.001
2008-2011	339	1340	25.30%	2.18	[1.77,2.69]	<0.001	2.36	[1.90,2.92]	<0.001
2012-2015	332	1382	24.02%	2.03	[1.65,2.51]	<0.001	2.21	[1.79,2.74]	<0.001
2016-2019	240	1159	20.71%	1.68	[1.35,2.09]	<0.001	1.80	[1.44,2.26]	<0.001
2020-2024	154	1144	13.46%	1.00		.	1.00		.

9.5.5 Risk factors for treatment interruptions (TI) during the first year of treatment

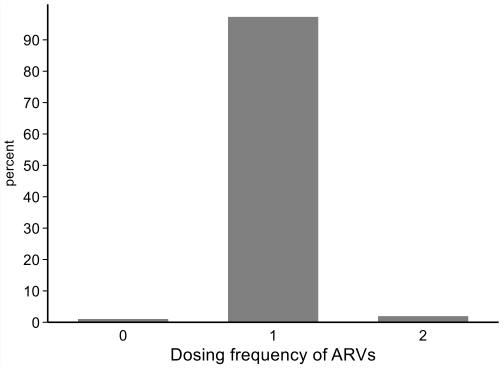
	TI	All		Univariable logistic regression			Multivariable logistic regression		
	435	5991	7.26%	OR	[95% CI]	p value	OR	[95% CI]	p value
HIV transmission category									
Male IDU	90	638	14.11%	4.51	[3.33,6.10]	<0.001	3.24	[2.36,4.44]	<0.001
Female IDU	54	226	23.89%	8.62	[5.97,12.46]	<0.001	6.10	[4.13,9.00]	<0.001
Male heterosexual	73	1088	6.71%	1.98	[1.44,2.70]	<0.001	1.62	[1.15,2.27]	0.005
Female heterosexual	108	1001	10.79%	3.32	[2.50,4.42]	<0.001	2.32	[1.68,3.21]	<0.001
Other	15	334	4.49%	1.29	[0.74,2.25]	0.368	1.34	[0.75,2.37]	0.323
MSM	95	2704	3.51%	1.00		.	1.00		.
Age at baseline									
< 30 years	169	1456	11.61%	2.47	[1.79,3.42]	<0.001	1.66	[1.17,2.36]	0.005
30-50 years	215	3524	6.10%	1.22	[0.89,1.67]	0.208	0.92	[0.66,1.28]	0.614
≥ 50	51	1011	5.04%	1.00		.	1.00		.
AIDS at baseline									
Yes	72	893	8.06%	1.14	[0.88,1.49]	0.317			
No	363	5098	7.12%	1.00		.			
CD4 count at baseline									
< 50	51	669	7.62%	1.17	[0.84,1.63]	0.360			
50-199	87	1143	7.61%	1.17	[0.88,1.54]	0.277			
200-349	118	1492	7.91%	1.22	[0.94,1.57]	0.131			
Missing	37	535	6.92%	1.05	[0.72,1.53]	0.792			
≥ 350	142	2152	6.60%	1.00		.			
HIV-RNA at baseline									
10.000-99.999	149	2027	7.35%	0.91	[0.69,1.20]	0.510			
≥ 100.000	142	2134	6.65%	0.82	[0.62,1.08]	0.160			
Missing	59	769	7.67%	0.95	[0.68,1.35]	0.790			
≤ 9.999	85	1061	8.01%	1.00		.			
Nationality									
High prevalence countries	89	741	12.01%	1.93	[1.51,2.48]	<0.001	1.35	[1.00,1.82]	0.048
Low prevalence countries	346	5250	6.59%	1.00		.	1.00		.
Population size of area of residence									
Rural areas	136	2444	5.56%	0.65	[0.52,0.81]	<0.001	0.87	[0.69,1.10]	0.231
Capital cities	72	821	8.77%	1.06	[0.80,1.40]	0.689	1.37	[1.02,1.84]	0.039
Vienna	227	2726	8.33%	1.00		.	1.00		.
Year of ART Initiation									
2004-2007	166	966	17.18%	8.92	[5.84,13.62]	<0.001	6.67	[4.33,10.27]	<0.001
2008-2011	125	1340	9.33%	4.42	[2.88,6.80]	<0.001	3.58	[2.31,5.54]	<0.001
2012-2015	86	1382	6.22%	2.85	[1.83,4.46]	<0.001	2.60	[1.66,4.08]	<0.001
2016-2019	32	1159	2.76%	1.22	[0.72,2.06]	0.455	1.24	[0.73,2.10]	0.425
2020-2024	26	1144	2.27%	1.00		.	1.00		.

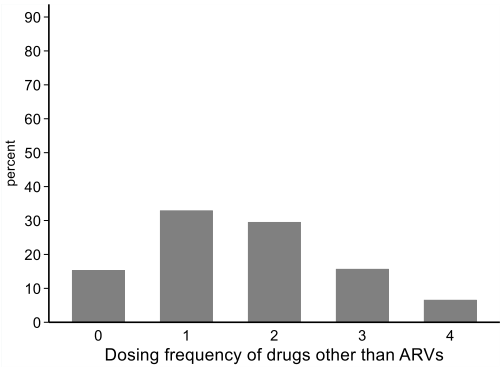
9.7 Frequency of drug dosing

9.7.1 Overview

22 of 4920 (0.4%) patients do not take any drugs at all and 21 (0.4%) patients have no ART but take other drugs. 729 (14.8%) patients are receiving ART only.

	Number of patients					
Dosing frequency	**0**	**1**	**2**	**3**	**4**	**Total**
Antiretrovirals (ARVs)	43	4786	91	0	0	4920
Drugs other than ARVs	751	1619	1453	773	324	4920
Overall dosing frequency	22	1663	1900	969	366	4920
Overall dosing frequency in patients with once daily ARVs	0	1659	1835	936	356	4786





9.7.2 Most frequent regimen on September 1st 2025

Regimen	Frequency	Percent
BGV FTC TAF	2,309	47.34
3TC DGV	1,148	23.54
3TC DOR TDF	354	7.26
FTC RPV TAF	186	3.81
3TC ABC DGV	119	2.44
CAB RPV	106	2.17
DGV FTC TDF	58	1.19
EVG FTC TAF	48	0.98
DGV DOR	46	0.94
DGV FTC TAF	46	0.94
DGV RPV	44	0.9
3TC ABC RAL	41	0.84
3TC DGV DOR	38	0.78
FTC RAL TDF	34	0.7
EFV FTC TDF	25	0.51
FTC RAL TAF	25	0.51
FTC RPV TDF	22	0.45
3TC ABC DOR	20	0.41
3TC ABC NVP	18	0.37
DGV DRV RTVb	18	0.37
BGV DOR FTC TAF	17	0.35
FTC NVP TAF	16	0.33
FTC NVP TDF	12	0.25
Other	127	2.62
Total	**4877**	**100.00**

9.8 Use of antiretroviral drugs to prevent HIV infection

PEP

	Non-occupational PEP started in									
	2016	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**
Sex										
Women	37	40	63	65	44	45	42	79	63	13
Men	107	134	160	263	150	180	189	210	215	31
Age (years)										
<30	64	97	114	164	104	126	118	150	135	23
30-48	72	72	102	150	83	94	107	123	126	19
≥50	8	5	7	14	7	5	6	16	17	2
Area of residence										
Vienna	74	101	126	192	109	120	130	160	141	23
Lower Austria	4	6	10	13	21	13	16	27	33	3
Burgenland	1	0	1	4	2	2	2	3	1	0
Upper Austria	3	15	17	25	11	32	21	23	27	5
Salzburg	0	7	8	11	5	3	8	3	12	0
Tyrol	22	11	23	29	28	29	18	34	26	9
Vorarlberg	2	1	2	3	3	3	9	11	5	0
Styria	10	6	14	17	7	10	17	18	17	2
Carinthia	0	0	1	1	0	0	0	1	1	0
Missing/Foreign	28	27	21	33	8	13	10	9	15	2

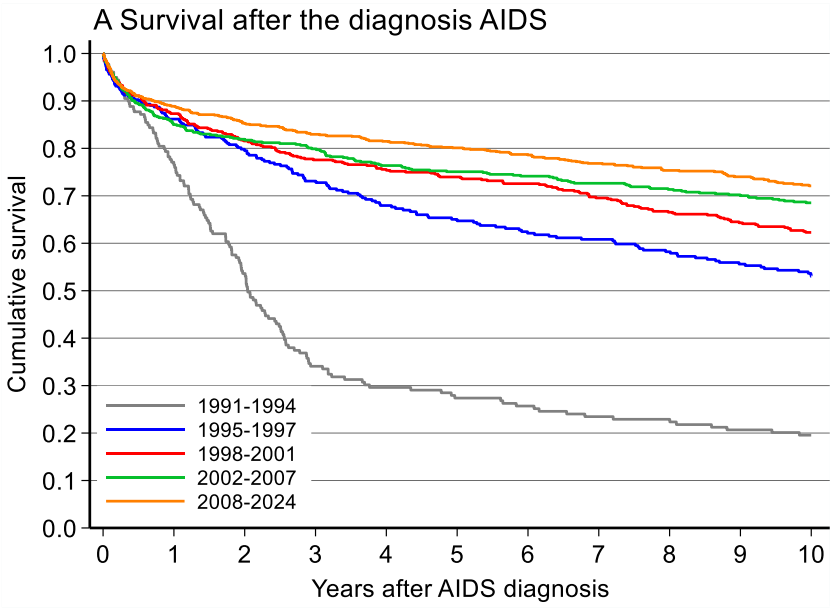
PrEP

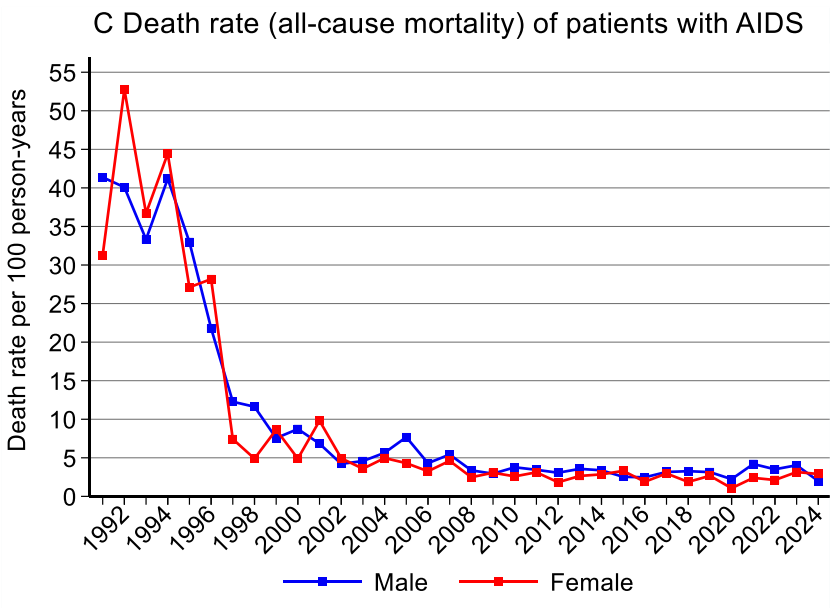
	PrEP started in										On PrEP at 01.03.2025
	2016	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	
Sex											
Women	0	1	3	9	5	2	4	12	15	3	44
Men	6	103	202	289	214	305	431	488	545	128	2137
Age (years)											
<30	3	33	53	83	65	112	177	181	208	47	734
30-48	3	65	126	189	133	159	209	283	298	73	1235
≥50	0	6	26	26	21	36	49	36	54	11	212
Area of residence											
Vienna	1	79	84	132	66	90	107	155	151	33	746
Lower Austria	0	8	9	12	9	9	15	26	30	5	108
Burgenland	0	0	0	3	1	3	2	2	2	0	12
Upper Austria	0	0	21	28	32	48	71	86	96	34	386
Salzburg	0	2	6	7	5	5	24	25	52	11	117
Tyrol	4	12	61	90	70	120	157	147	163	33	520
Vorarlberg	1	1	19	12	19	22	35	31	33	12	161
Styria	0	1	4	10	15	8	19	25	29	3	109
Carinthia	0	0	0	0	1	1	1	0	2	0	5
Missing/Foreign	0	1	1	4	1	1	4	3	2	0	17

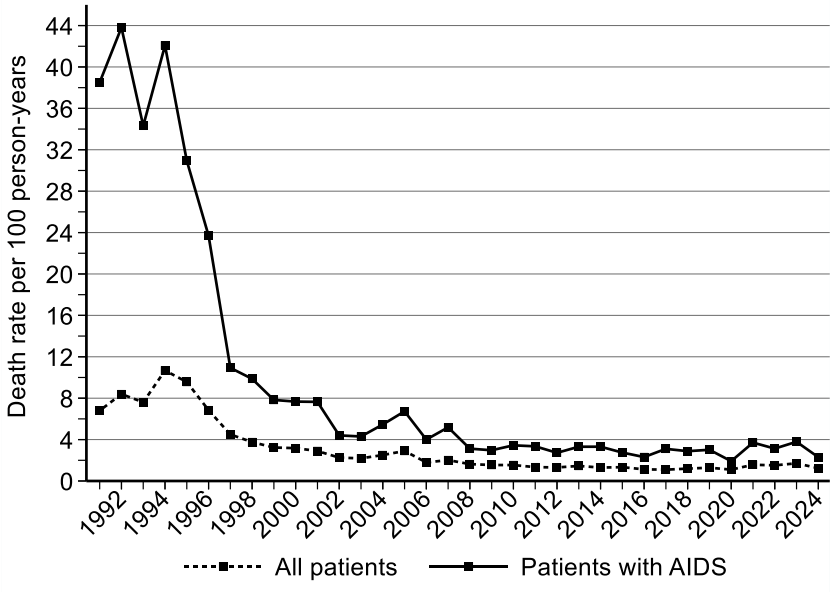
10 Disease progression and Response to ART

10.1 Mortality of patients with AIDS since 1985

The documentation of death is partially incomplete in the HIV Patient Management System (e.g. considerable proportion of patients without follow-up since 2001 are not documented dead but presumed dead, see chapter 4).





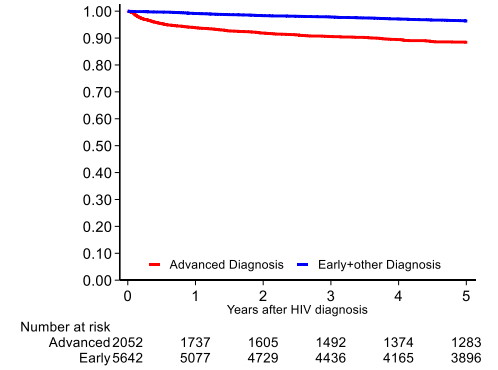

Death rate per 100 person-years
44
40
36
32
28
24
20
16
12
8
4
0
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020
2022
2024
All patients
Patients with AIDS

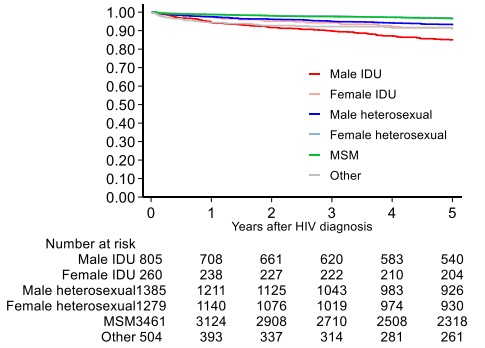
10.2 Factors associated with mortality in patients diagnosed since 2001

Date of censoring: last contact with the HIV centre (34 missing)

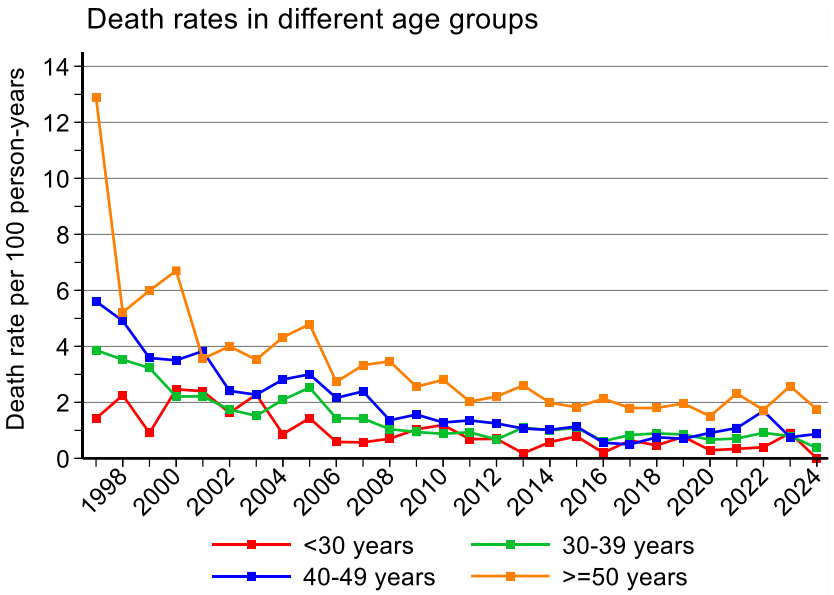
All centres	928	7711	12.03%	**Univariable Cox Regression**			**Multivariable Cox Regression**		
	Frequencies		**%**	**HR**	**[95% CI]**	**p value**	**HR**	**[95% CI]**	**p value**
Demographic characteristics									
Age at time of HIV diagnosis									
< 30 years	235	2630	8.94%	0.25	[0.21,0.30]	<0.001	0.19	[0.15,0.23]	<0.001
30-50 years	430	4071	10.56%	0.32	[0.28,0.38]	<0.001	0.29	[0.24,0.34]	<0.001
≥ 50	263	1010	26.04%	1.00		.	1.00		.
HIV transmission category									
Male IDU	253	808	31.31%	3.69	[3.10,4.39]	<0.001	4.09	[3.40,4.91]	<0.001
Female IDU	85	260	32.69%	3.42	[2.67,4.37]	<0.001	4.08	[3.14,5.29]	<0.001
Male heterosexual	195	1385	14.08%	1.69	[1.40,2.04]	<0.001	1.17	[0.97,1.43]	0.107
Female heterosexual	81	1280	6.33%	0.69	[0.53,0.88]	0.003	0.71	[0.55,0.92]	0.010
Other	60	510	11.76%	1.91	[1.44,2.53]	<0.001	1.69	[1.26,2.25]	<0.001
MSM	254	3468	7.32%	1.00		.	1.00		.
Population size of area of residence									
Missing value	7	112	6.25%	0.75	[0.36,1.59]	0.458	1.16	[0.54,2.47]	0.704
< 100 000	299	3149	9.50%	0.60	[0.52,0.69]	<0.001	0.66	[0.57,0.77]	<0.001
≥ 100 000	102	1035	9.86%	0.60	[0.49,0.75]	<0.001	0.78	[0.63,0.97]	0.026
> 1 million	520	3415	15.23%	1.00		.	1.00		.
Nationality									
Missing/Unknown	4	57	7.02%	0.56	[0.21,1.50]	0.249	0.76	[0.28,2.06]	0.589
Low prevalence countries	109	2095	5.20%	0.41	[0.33,0.50]	<0.001	0.55	[0.45,0.68]	<0.001
High prevalence countries	51	811	6.29%	0.40	[0.30,0.53]	<0.001	0.67	[0.50,0.91]	0.010
Austria	764	4748	16.09%	1.00		.	1.00		.
Stage of disease									
Advanced diagnosis									
Yes	382	2053	18.61%	2.05	[1.80,2.34]	<0.001	1.88	[1.64,2.15]	<0.001
No	546	5658	9.65%	1.00		.	1.00		.
Calendar period of HIV test									
2005-2008	248	1552	15.98%	0.76	[0.64,0.90]	0.002	0.86	[0.72,1.01]	0.073
2009-2012	182	1525	11.93%	0.74	[0.61,0.90]	0.002	0.84	[0.69,1.02]	0.073
2013-2016	98	1335	7.34%	0.63	[0.49,0.80]	<0.001	0.73	[0.57,0.93]	0.011
2017-2020	49	1040	4.71%	0.57	[0.42,0.78]	<0.001	0.65	[0.47,0.89]	0.008
≥ 2021	26	939	2.77%	0.68	[0.45,1.03]	0.068	0.67	[0.44,1.03]	0.067
2001-2004	325	1320	24.62%	1.00		.	1.00		.

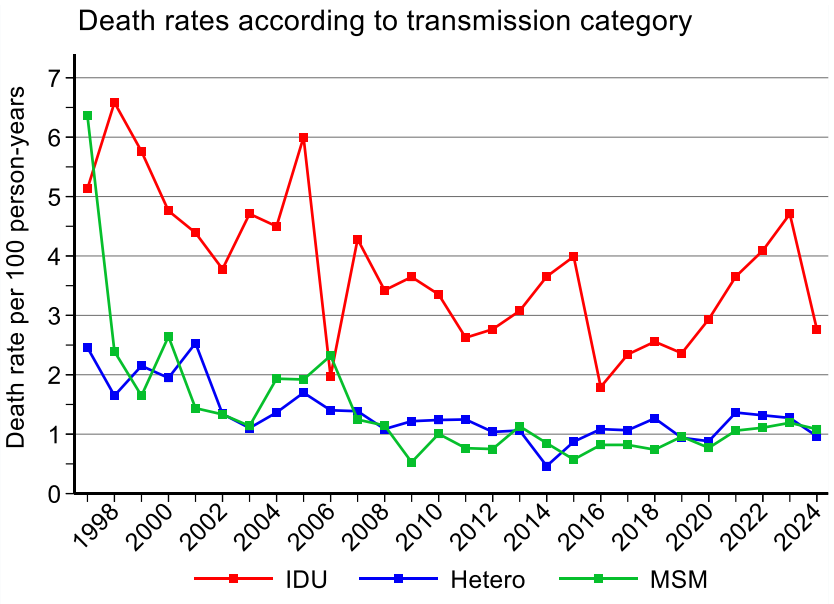
Survival after the HIV diagnosis

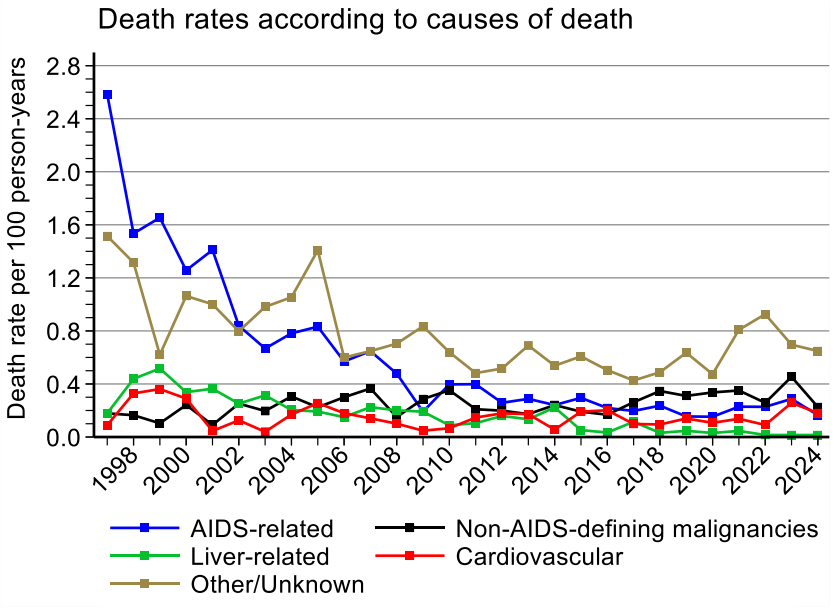




Mortality in combination ART era (years 1997-2017)

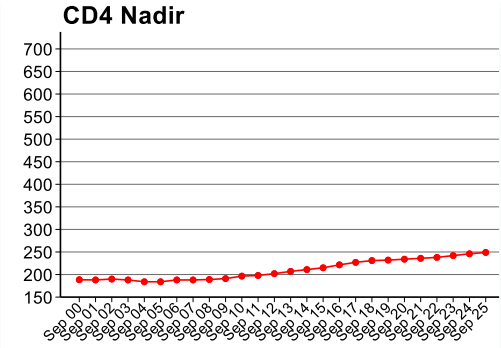


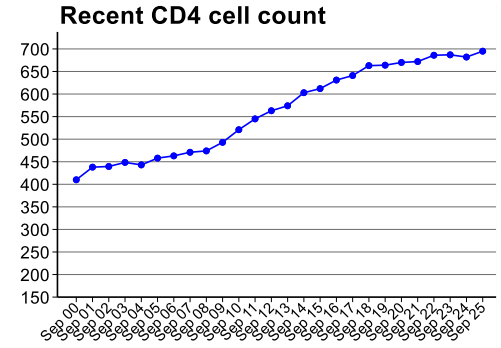


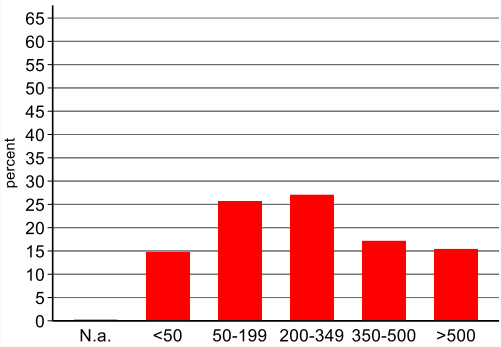

Death rates according to causes of death
Death rate per 100 person-years
2.8
2.4
2.0
1.6
1.2
0.8
0.4
0.0
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020
2022
2024
AIDS-related
Non-AIDS-defining malignancies
Liver-related
Cardiovascular
Other/Unknown

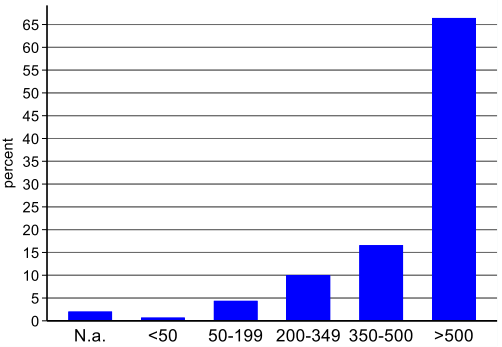
10.3 CD4 cell counts

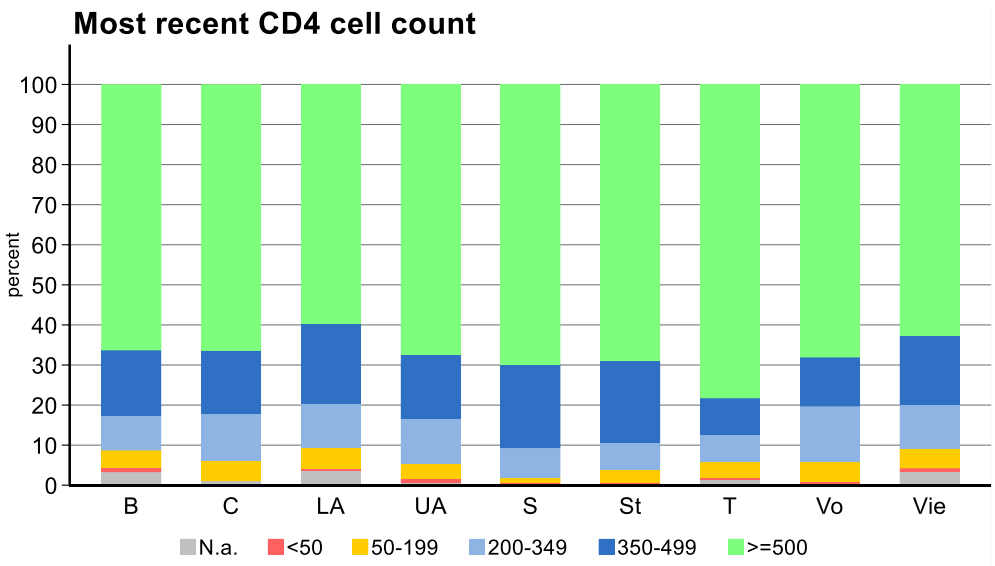
10.3.1 CD4 cell counts: nadir and most recent







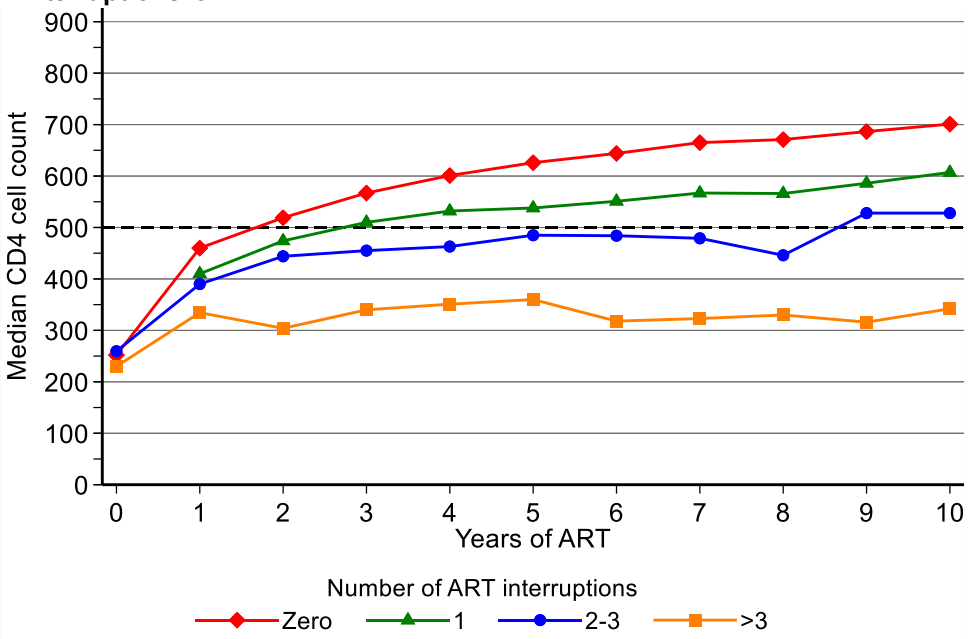




10.3.2 Median CD4 cell counts after initiating ART

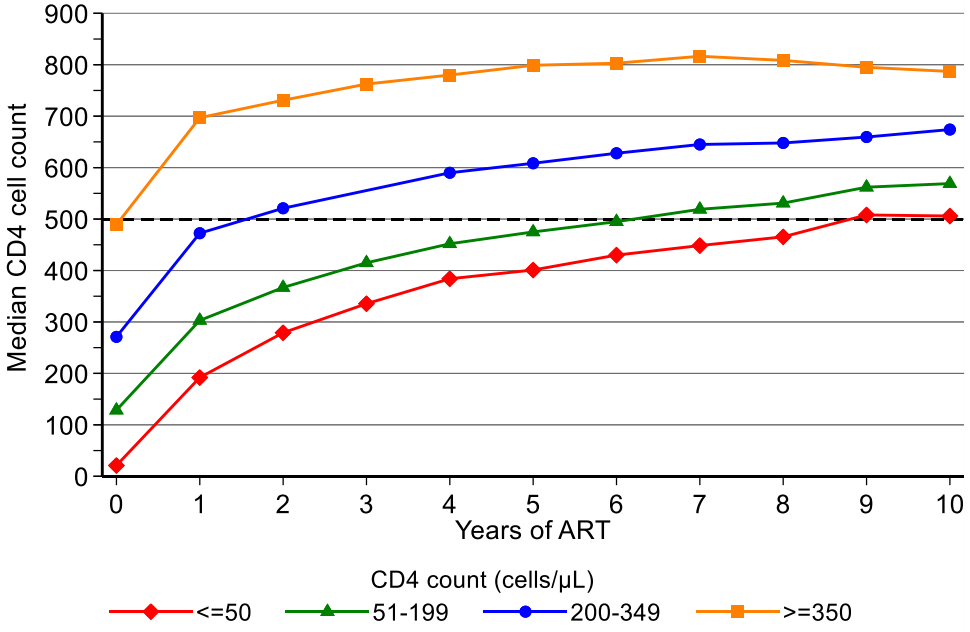
The analyses include only patients who initiated ART after January 1st, 1997.

a) Interruptions of ART



b) Baseline CD4 count

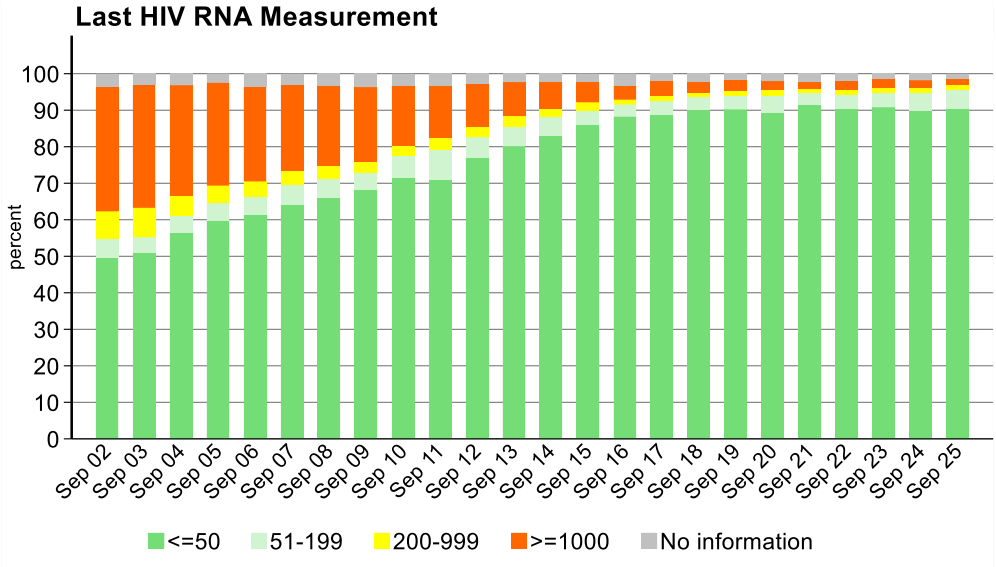
Patients were included until treatment interruption.

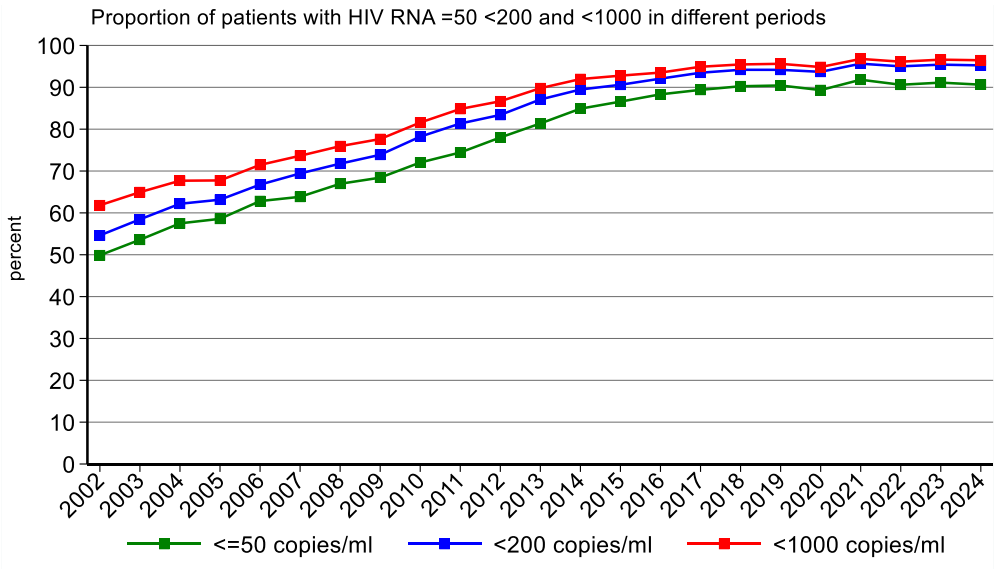


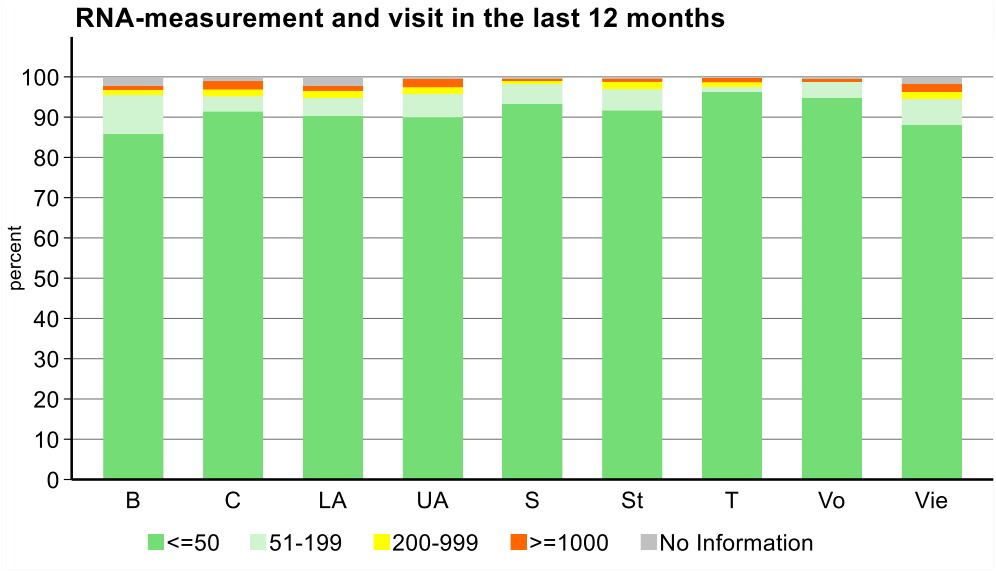
10.4 HIV RNA (viral load)

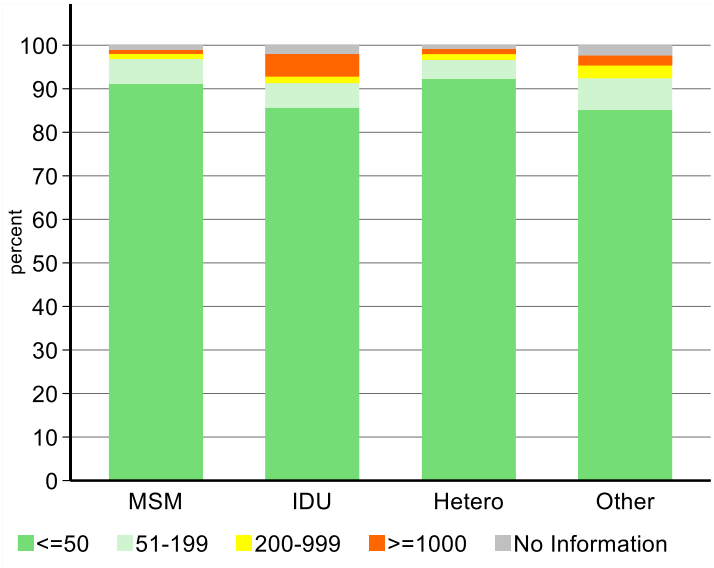
10.4.1 Last HIV RNA currently in care regardless of ART

96.8% of the patients currently in care (5048 of 5217) have a current HIV RNA below 400 copies/ml.



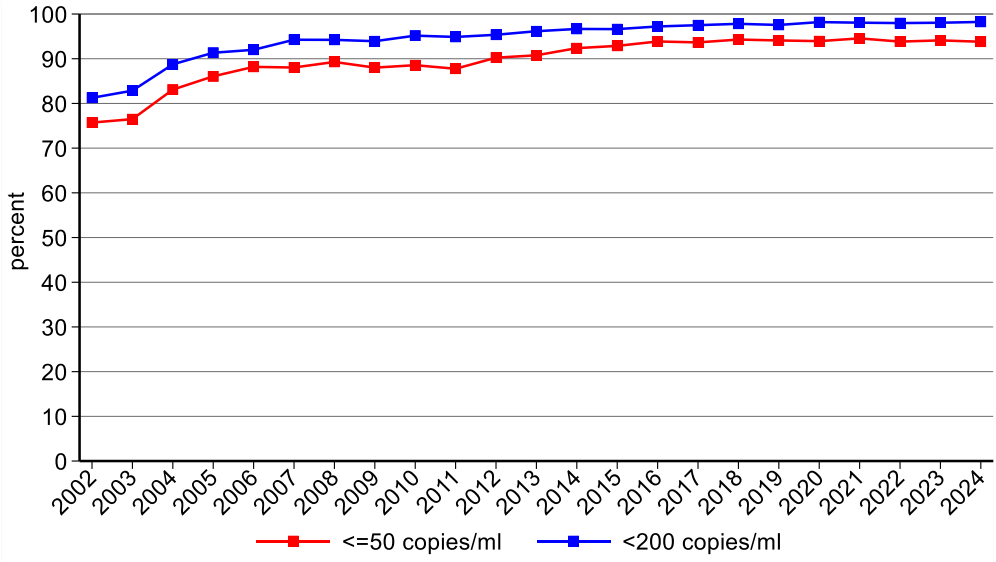



RNA-measurement and visit in the last 12 months
percent
100
90
80
70
60
50
40
30
20
10
0
B
C
LA
UA
S
St
T
Vo
Vie
<=50
51-199
200-999
>=1000
No Information


percent
100
90
80
70
60
50
40
30
20
10
0
MSM
IDU
Hetero
Other
<=50
51-199
200-999
>=1000
No Information

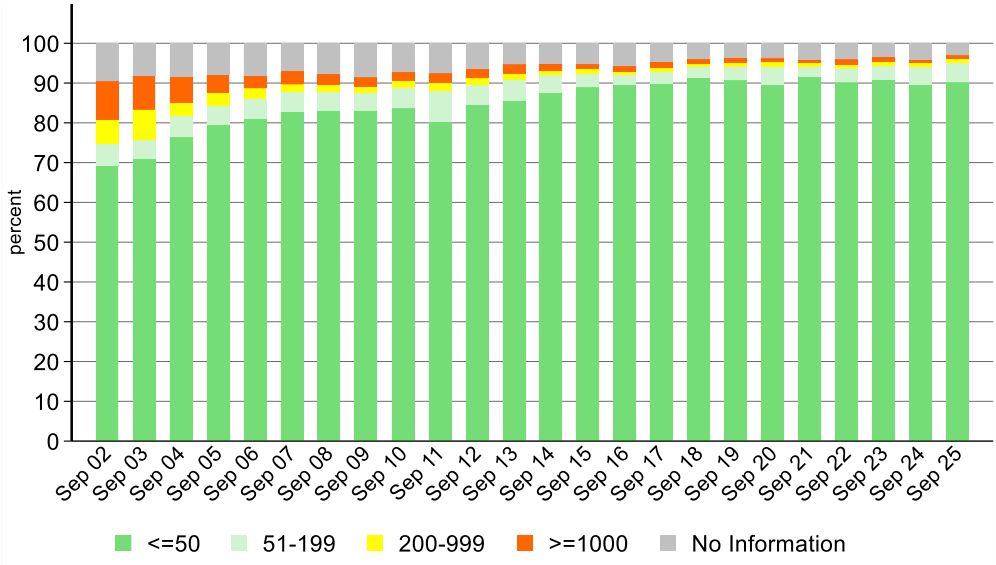
10.4.2 Last HIV RNA on ART

Patients were included if there were at least 75 days between ART initiation and HIV RNA measurement.



10.4.2.1 Last HIV RNA on ART at different points in time

Patients currently in care (12 months), currently on ART and measurement of viral load at least 2.5 months after ART initiation



10.4.3 Risk factors for viral replication

Risk factors for HIV RNA ≥200 copies/ml on ART

The analyses in this chapter include all patients with a visit in the last 12 months who have been on ART for at least 75 days before the measurement of the viral load.

				Univariable logistic regression			Multivariable logistic regression		
	115	5093	2.26%	OR	[95% CI]	p value	OR	[95% CI]	p value
Age									
< 30 years	5	151	3.31%	2.02	[0.79,5.17]	0.140	2.11	[0.77,5.80]	0.146
30-50 years	63	2116	2.98%	1.81	[1.24,2.66]	0.002	1.89	[1.25,2.87]	0.003
≥ 50	47	2826	1.66%	1.00		.	1.00		.
HIV transmission category									
Male IDU	22	380	5.79%	3.93	[2.28,6.77]	<0.001	2.79	[1.57,4.96]	<0.001
Female IDU	6	179	3.35%	2.22	[0.92,5.34]	0.076	1.20	[0.48,3.03]	0.695
Male heterosexual	21	936	2.24%	1.47	[0.85,2.53]	0.169	1.41	[0.80,2.50]	0.239
Female heterosexual	19	1029	1.85%	1.20	[0.68,2.11]	0.522	0.85	[0.46,1.57]	0.595
Other	12	297	4.04%	2.69	[1.38,5.24]	0.004	2.26	[1.13,4.53]	0.021
MSM	35	2272	1.54%	1.00		.	1.00		.
Nationality									
Missing/unknown	0	31	0.00%	1.00	[1.00,1.00]	.	1.00	[1.00,1.00]	.
High prevalence	15	421	3.56%	1.70	[0.97,2.98]	0.066	1.42	[0.75,2.70]	0.282
Low prevalence	25	1122	2.23%	1.05	[0.66,1.65]	0.846	0.98	[0.60,1.59]	0.937
Austria	75	3519	2.13%	1.00		.	1.00		.
Population size of area of residence									
Rural areas	45	2387	1.89%	0.62	[0.42,0.92]	0.018			
Capital cities	14	849	1.65%	0.54	[0.30,0.97]	0.041			
Vienna	56	1857	3.02%	1.00		.			
AIDS									
Yes	17	791	2.15%	0.94	[0.56,1.59]	0.823			
No	98	4302	2.28%	1.00		.			
CD4 Nadir									
<50	24	768	3.13%	1.74	[1.07,2.84]	0.025	1.61	[0.96,2.68]	0.069
50-199	36	1295	2.78%	1.55	[1.01,2.37]	0.045	1.36	[0.86,2.14]	0.188
≥200	55	3029	1.82%	1.00		.	1.00		.
ART initiation									
Before 1.1.1997	5	343	1.46%	0.62	[0.25,1.54]	0.306	0.32	[0.12,0.85]	0.021
After 1.1.1997	110	4750	2.32%	1.00		.	1.00		.
Ever ART interruptions									
None	66	3955	1.67%	0.25	[0.16,0.38]	<0.001	0.19	[0.12,0.31]	<0.001
1	17	643	2.64%	0.39	[0.22,0.72]	0.002	0.36	[0.19,0.66]	0.001
≥2	32	495	6.46%	1.00		.	1.00		.
Art duration									
< 9 months	5	76	6.58%	3.26	[1.29,8.23]	0.013	4.19	[1.59,11.05]	0.004
9-18 months	7	152	4.61%	2.23	[1.02,4.88]	0.045	2.61	[1.13,5.98]	0.024
> 18 months	103	4865	2.12%	1.00		.	1.00		.

11 Development of resistance to ART (data: 03/2025)

11.1 Abstract

Prevalence of Development of Drug Resistance in HIV infected patients in Austria

Objective: To determine the prevalence of development of drug resistance, predictors and temporal trends in resistance.
Method: Patients currently in care in one of nine centres who have ever been on antiretroviral therapy (ART) were analyzed. Mutations were judged as resistant according to "2025 Update of the Drug Resistance Mutations in HIV-1" from the International Antiviral-Society-USA (https://www.iasusa.org/wp-content/uploads/2025/03/33-2-mutations.pdf).
Results: Overall 4823 patients have ever received ART, 1231 had a resistance test after ART (25.5%). The overall prevalence of development of drug resistance was 64.3% (792 of 1231 patients), the prevalence of NRTI resistance was 29.4%, the prevalence of NNRTI resistance was 25.8%, and the prevalence of PI resistance was 53.8%. The prevalence of 3-class-resistance was 13.1% (161 of 1231 patients). The risk factors for developing a 3-class-resistance were initial therapy before 1997 (OR=29.1; 95% CI: 18.6-45.5) as well as from 1997 to 2003 (OR=7.6; 95% CI: 4.7-12.2), a CD4 nadir <50 (OR=3.5; 95% CI: 2.2-5.6), a CD4 nadir between 50 and 200 (OR=2.2; 95% CI: 1.4-3.4) and an age at ART-start <30 (OR=2.5; 95% CI: 1.04-6.2). The risk to develop a 3-class-resistance was lower in patients with a low viral load (for <50 copies/ml OR=0.3; 95% CI: 0.1-0.7).
Conclusions: The overall prevalence of development of drug resistance is at a rather high level, while the prevalence of 3-class-resistance was found to be stabilizing at a low level. The risk for developing resistance is small in those who initiated therapy in recent years.

11.2 Definition of resistance under ART

The rate of resistance development during antiretroviral therapy („percent with resistance“) corresponds to the number of patients with resistance mutations in relation to the number of patients on ART (see also chapter 5).
“Cumulative resistance” includes any mutation ever found in a particular patient.
The resistance mutations have been classified according to the “2025 Update of the Drug Resistance Mutations in HIV-1” from the International AIDS-Society-USA (https://www.iasusa.org/wp-content/uploads/2025/03/33-2-mutations.pdf).

The following codons and amino acids have been classified as resistance (IAS):

Reverse transcriptase				Protease	
NRTI		NNRTI			
M41	L	V90	I	L10	F, R, I, V
A62	V	A98	G	V11	I
K65	R, E, N	L100	I	K20	R, M, T
D67	N	K101	H, E, P	L24	I
T69	ins	K103	N, S	D30	N
K70	R, E	V106	A, M, I, T	V32	I
L74	V	V108	I	L33	F
V75	I	E138	A, G, K, Q, R	M36	I, L, V
F77	L	V179	D, F, T, L	K43	T
Y115	F	Y181	C, I, V	M46	I, L
F116	Y	Y188	L, H, C	I47	V, A
Q151	M	G190	A, S, E	G48	V
M184	V, I	H221	Y	I50	V, L
L210	W	P225	H	F53	L, Y
T215	Y, F	F227	C, L, R, I, V	I54	V, M, L, T, S, A
K219	Q, E	M230	I, L	Q58	E
		L234	I	I62	V
		Y318	F	H69	K, R
				A71	V, T
				G73	S, T, C, A
				T74	P
				L76	V
				V77	I
				V82	A, T, F, S, L, M
				N83	D
				I84	V
				I85	V
				N88	D, S
				L89	V, I, M
				L90	M

11.3 Frequency of resistance

11.3.1 Frequency of NRTI-associated resistance mutations

11.3.1.1 Overview

The table shows the numbers of patients with NRTI-associated resistance mutations among all patients who have ever been treated with Nucleoside Reverse Transcriptase Inhibitors („NRTI“).

All centers	Deceased since 1997, NRTI use	Patients currently in care and NRTI use ever
	N = 1665	N = 4812
Resistance to NRTI	266 (16.0%)	361 (7.5%)
Codon 41	96 (5.8%)	129 (2.7%)
Codon 62	10 (0.6%)	21 (0.4%)
Codon 65	13 (0.8%)	24 (0.5%)
Codon 67	84 (5.0%)	114 (2.4%)
Codon 69	3 (0.2%)	2 (0.0%)
Codon 70	64 (3.8%)	97 (2.0%)
Codon 74	37 (2.2%)	28 (0.6%)
Codon 75	6 (0.4%)	6 (0.1%)
Codon 77	3 (0.2%)	6 (0.1%)
Codon 115	7 (0.4%)	14 (0.3%)
Codon 116	2 (0.1%)	4 (0.1%)
Codon 151	2 (0.1%)	6 (0.1%)
Codon 184	207 (12.4%)	250 (5.2%)
Codon 210	63 (3.8%)	60 (1.2%)
Codon 215	108 (6.5%)	139 (2.9%)
Codon 219	53 (3.2%)	62 (1.3%)

11.3.1.2 Risk factors for the resistance mutation K65R of the RT

Recruitment for this analysis has been in agreement to entry criteria of COHERE. Additionally, patients who died before 1.1.2000 have been excluded.

All centres						**Model 1 (N = 9420)**		
	Frequencies N=			Univariable regression			**Multivariable regression***	
Variable	48 /	9420	(0.5%)	OR (95% CI)	p-value	**OR (95% CI)**		**p-value**
Demographic characteristics								
Age at ART start								
<30 years	12 /	2493	(0.5%)	2.2 0.6 - 7.7	0.230			
30-50 years	33 /	5577	(0.6%)	2.7 0.8 - 8.7	0.103			
>50 years	3 /	1350	(0.2%)	1				
Sex/ mode of transmission								
Male IDU	7 /	1086	(0.6%)	2.4 0.9 - 6.2	0.073	**1.4**	**0.5 – 3.6**	**0.528**
Female IDU	6 /	462	(1.3%)	4.8 1.8 - 13.1	0.002	**2.6**	**0.9 – 7.3**	**0.064**
Male heterosexual	10 /	1641	(0.6%)	2.3 1.0 - 5.3	0.064	**1.8**	**0.7 – 4.3**	**0.191**
Female heterosexual	14 /	1614	(0.9%)	3.2 1.5 - 7.1	0.004	**2.7**	**1.2 – 6.0**	**0.017**
Other	0 /	566	(0.0%)	- -	-	**-**	**-**	**-**
MSM	11 /	4051	(0.3%)	1		**1**		
Population size of area of residence								
Missing value	0 /	92	(0.0%)	- -	-			
Rural areas	16 /	3755	(0.4%)	0.7 0.4 - 1.2	0.205			
Capital cities	5 /	1320	(0.4%)	0.6 0.2 - 1.5	0.287			
Vienna	27 /	4253	(0.6%)	1				
Stage of disease								
AIDS								
Yes	27 /	2577	(1.0%)	3.4 1.9 - 6.1	<0.001			
No	21 /	6843	(0.3%)	1				
CD4 nadir								
Missing value	0 /	110	(0.0%)	- -	-	**-**	**-**	**-**
<50 cells/µl	23 /	1647	(1.4%)	9.0 4.0 - 20.2	<0.001	**7.0**	**3.1 – 16.1**	**<0.001**
50-199 cells/µl	17 /	2573	(0.7%)	4.2 1.8 - 9.8	0.001	**3.2**	**1.4 – 7.7**	**0.007**
≥200 cells/µl	8 /	5090	(0.2%)	1		**1**		
ART								
Abacavir use ever								
Yes	21 /	3385	(0.6%)	1.4 0.8 - 2.5	0.260			
No	27 /	6035	(0.4%)	1				
Tenofovir use ever								
Yes	45 /	6128	(0.7%)	8.1 2.5 - 26.1	<0,001	**6.5**	**2.0 – 21.1**	**0.002**
No	3 /	3292	(0.1%)	1		**1**		
ART initiation								
Before 1.1.1997	9 /	821	(1.1%)	2.4 1.2 - 5.0	0.017			
After 1.1.1997	39 /	8599	(0.5%)	1				

* adjusted for the variables: age, population size of area of residence, Abacavir use ever, ART initiation

11.3.2 Frequency of NNRTI-associated resistance mutations

The table shows the numbers of NNRTI-associated resistance mutations among patients who have ever been treated with Non-Nucleoside Reverse Transcriptase Inhibitors („NNRTI“).

All centers	Deceased since 1997, NNRTI use	Patients currently in care and NNRTI use ever
	N = 968	N = 2455
Resistance to NNRTI	203 (21.0%)	262 (10.7%)
Codon 90	10 (1.0%)	21 (0.9%)
Codon 98	18 (1.9%)	14 (0.6%)
Codon 100	5 (0.5%)	8 (0.3%)
Codon 101	32 (3.3%)	27 (1.1%)
Codon 103	104 (10.7%)	125 (5.1%)
Codon 106	19 (2.0%)	28 (1.1%)
Codon 108	30 (3.1%)	23 (0.9%)
Codon 138	13 (1.3%)	35 (1.4%)
Codon 179	8 (0.8%)	15 (0.6%)
Codon 181	78 (8.1%)	69 (2.8%)
Codon 188	10 (1.0%)	14 (0.6%)
Codon 190	47 (4.9%)	43 (1.8%)
Codon 221	15 (1.5%)	13 (0.5%)
Codon 225	7 (0.7%)	8 (0.3%)
Codon 227	6 (0.6%)	4 (0.2%)
Codon 230	4 (0.4%)	6 (0.2%)
Codon 234	0 (0.0%)	0 (0.0%)
Codon 318	4 (0.4%)	1 (0.0%)

11.3.3 Frequency of PI-associated resistance mutations

The table shows the numbers of the PI-associated resistance mutations among patients who have ever been treated with Protease Inhibitors („PI").

Minor mutations:

All centers	Deceased since 1997, PI use N = 1272	Patients currently in care and PI use ever N = 2109
Any minor resistance to PI	395 (31.1%)	554 (26.3%)
Codon 10	126 (9.9%)	171 (8.1%)
Codon 11	7 (0.6%)	4 (0.2%)
Codon 20	71 (5.6%)	75 (3.6%)
Codon 24	8 (0.6%)	10 (0.5%)
Codon 33	21 (1.7%)	31 (1.5%)
Codon 36	191 (15.0%)	282 (13.4%)
Codon 43	3 (0.2%)	7 (0.3%)
Codon 53	10 (0.8%)	12 (0.6%)
Codon 62	53 (4.2%)	80 (3.8%)
Codon 69	36 (2.8%)	102 (4.8%)
Codon 71	158 (12.4%)	142 (6.7%)
Codon 73	22 (1.7%)	15 (0.7%)
Codon 77	143 (11.2%)	187 (8.9%)
Codon 85	1 (0.1%)	2 (0.1%)
Codon 89	35 (2.8%)	101 (4.8%)

Major mutations:	All centers	Deceased since 1997, PI use N = 1272	Patients currently in care and PI use ever N = 2109
	Any major resistance to PI	124 (9.7%)	138 (6.5%)
	Codon 30	12 (0.9%)	26 (1.2%)
	Codon 32	12 (0.9%)	6 (0.3%)
	Codon 46	64 (5.0%)	63 (3.0%)
	Codon 47	8 (0.6%)	6 (0.3%)
	Codon 48	4 (0.3%)	6 (0.3%)
	Codon 50	1 (0.1%)	5 (0.2%)
	Codon 54	40 (3.1%)	43 (2.0%)
	Codon 58	7 (0.6%)	10 (0.5%)
	Codon 74	0 (0.0%)	2 (0.1%)
	Codon 76	1 (0.1%)	0 (0.0%)
	Codon 82	42 (3.3%)	39 (1.8%)
	Codon 83	1 (0.1%)	1 (0.0%)
	Codon 84	22 (1.7%)	16 (0.8%)
	Codon 88	16 (1.3%)	19 (0.9%)
	Codon 90	65 (5.1%)	64 (3.0%)

11.3.4 Resistance to single or multiple drug classes

All centres	Deceased since 1997, ever ART N = 1674	Patients currently in care and ever ART N = 4823
Resistance test available	721 (43.1%)	1231 (25.5%)
Wild type	211 (12.6%)	439 (9.1%)
"Any" resistance	510 (30.5%)	792 (16.4%)
NRTI	267 (15.9%)	362 (7.5%)
NNRTI	233 (13.9%)	317 (6.6%)
PI	429 (25.6%)	662 (13.7%)
NRTI and PI	208 (12.4%)	274 (5.7%)
NRTI and NNRTI	160 (9.6%)	202 (4.2%)
NNRTI and PI	187 (11.2%)	234 (4.9%)
3-class-resistance	136 (8.1%)	161 (3.3%)

11.3.5 Resistance according to demographic characteristics

All patients				Resistance to							
	Number of patients	Resistance test available	Wild type	Any resistance	NRTI	NNRTI	PI	NRTI and PI	NRTI and NNRTI	NNRTI and PI	3-class-resistance
Year of ART initiation											
Up to 1995	206	161	6	155	128	77	127	100	70	70	63
1996	130	91	21	70	55	31	57	43	29	22	21
1997	94	61	14	47	26	21	39	19	17	16	13
1998	97	49	7	42	14	10	36	9	6	6	3
1999	84	44	12	32	15	16	24	9	9	12	7
2000	95	53	10	43	19	15	40	17	10	14	10
2001	74	33	9	24	10	7	21	7	6	5	4
2002	90	43	18	25	11	8	22	10	5	6	5
2003	94	45	19	26	1	8	23	1	1	5	1
2004	115	38	16	22	6	8	20	6	3	6	3
2005	130	50	14	36	9	9	34	9	4	7	4
2006	137	33	13	20	5	11	15	3	5	6	3
2007	147	48	17	31	7	10	28	6	3	7	2
2008	155	39	22	17	8	7	13	5	4	5	3
2009	206	51	27	24	7	10	20	5	5	6	3
2010	218	45	21	24	5	8	19	3	4	4	3
2011	212	43	19	24	7	11	18	5	6	5	4
2012	222	39	19	20	8	12	17	5	7	9	4
2013	227	43	25	18	3	4	13	-	1	1	-
2014	211	31	12	19	4	5	16	2	1	4	1
2015	213	26	13	13	4	5	10	2	2	3	1
2016	212	22	13	9	2	5	8	2	1	4	1
2017	220	21	13	8	2	7	6	2	2	5	2
2018	167	20	14	6	1	2	5	1	-	1	-
2019	171	21	12	9	-	3	7	-	-	1	-
2020	145	19	13	6	1	3	4	-	1	1	-
2021	161	14	11	3	-	-	3	-	-	-	-
2022	204	15	12	3	-	1	3	-	-	1	-
2023	178	18	12	6	3	-	5	2	-	-	-
2024	208	15	7	8	1	3	7	1	-	2	-
Federal state											
Burgenland	83	21	8	13	4	4	11	4	2	2	2
Carinthia	254	36	15	21	8	6	16	4	3	3	1
Lower Austria	475	118	33	85	47	44	69	34	29	37	25
Upper Austria	670	182	66	116	74	53	93	59	44	34	33
Salzburg	291	70	16	54	22	26	44	16	13	19	10
Styria	465	116	46	70	22	25	61	18	15	16	11
Tyrol	583	178	50	128	66	42	104	45	27	33	21
Vorarlberg	243	57	15	42	15	12	37	10	7	11	6
Vienna	1697	443	188	255	102	103	221	84	60	79	52
Foreign countries	62	10	4	6	2	2	4	-	2	-	-
Missing value	-	-	-	-	-	-	-	-	-	-	-
Total	**4823**	**1231**	**441**	**790**	**362**	**317**	**660**	**274**	**202**	**234**	**161**

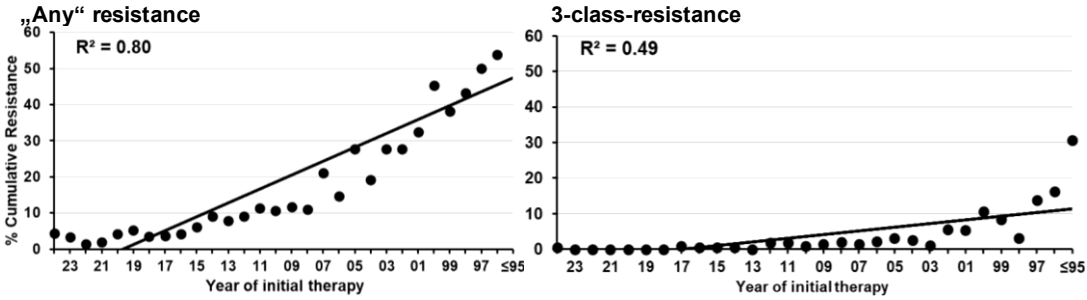
Patients who initiated ART after 2000	Number of patients	Resistance test	Wild type	Resistance to							
				Any resistance	NRTI	NNRTI	PI	NRTI and PI	NRTI and NNRTI	NNRTI and PI	3-class-resistance
Year of ART initiation											
2001	74	33	9	24	10	7	21	7	6	5	4
2002	90	43	18	25	11	8	22	10	5	6	5
2003	94	45	19	26	1	8	23	1	1	5	1
2004	115	38	16	22	6	8	20	6	3	6	3
2005	130	50	14	36	9	9	34	9	4	7	4
2006	137	33	13	20	5	11	15	3	5	6	3
2007	147	48	17	31	7	10	28	6	3	7	2
2008	155	39	22	17	8	7	13	5	4	5	3
2009	206	51	27	24	7	10	20	5	5	6	3
2010	218	45	21	24	5	8	19	3	4	4	3
2011	212	43	19	24	7	11	18	5	6	5	4
2012	222	39	19	20	8	12	17	5	7	9	4
2013	227	43	25	18	3	4	13	-	1	1	-
2014	211	31	12	19	4	5	16	2	1	4	1
2015	213	26	13	13	4	5	10	2	2	3	1
2016	212	22	13	9	2	5	8	2	1	4	1
2017	220	21	13	8	2	7	6	2	2	5	2
2018	167	20	14	6	1	2	5	1	-	1	-
2019	171	21	12	9	-	3	7	-	-	1	-
2020	145	19	13	6	1	3	4	-	1	1	-
2021	161	14	11	3	-	-	3	-	-	-	-
2022	204	15	12	3	-	1	3	-	-	1	-
2023	178	18	12	6	3	-	5	2	-	-	-
2024	208	15	7	8	1	3	7	1	-	2	-
Population size of area of residence											
Missing value	2	-	-	-	-	-	-	-	-	-	-
Rural areas	1959	335	151	184	53	72	157	40	32	51	25
Capital cities	688	140	56	84	22	26	68	15	11	11	5
Vienna	1468	297	164	133	30	49	112	22	18	32	14
Sex/ mode of transmission											
MSM	1920	265	146	119	24	47	96	18	13	26	9
Male IDU	274	77	39	38	12	15	32	9	7	10	5
Female IDU	106	48	18	30	3	7	29	3	1	6	1
Male heterosexual	784	146	66	80	26	27	70	21	17	18	13
Female heterosexual	822	209	88	121	36	48	99	24	20	32	14
Others	211	27	14	13	4	3	11	2	3	2	2
Age at time of HIV-test											
< 35 years	2043	490	219	271	70	102	230	51	42	68	30
≥ 35 years	2074	282	152	130	35	45	107	26	19	26	14
Total	**4117**	**772**	**371**	**401**	**105**	**147**	**337**	**77**	**61**	**94**	**44**

11.3.6 Cumulative resistance related to different time periods of ART initiation

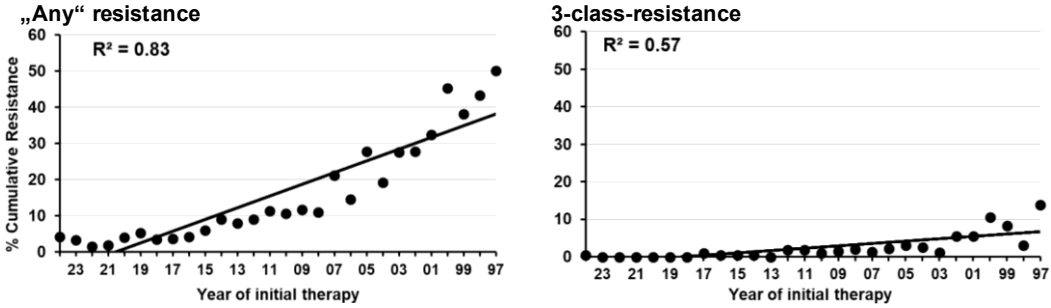
	Initial therapy before 1.1.1997		Initial therapy between 1.1.1997 and 31.12.2002		Initial therapy after 1.1.2003	
	N	%	N	%	N	%
Ever HIV RNA ≥ 200 copies/ml	319	94.9%	392	73.4%	1142	29.0%
At least 5 HIV RNA ≥ 200 copies/ml	270	80.4%	225	42.1%	293	7.4%
No resistance test after ART	84	25.0%	251	47.0%	3254	82.5%
Resistance test after ART	252	75.0%	283	53.0%	690	17.5%
Total	**336**	**100%**	**534**	**100%**	**3944**	**100%**
Number of NRTI-associated resistance mutations						
0 mutations	69	20.5%	188	35.2%	606	15.4%
1 mutation	34	10.1%	50	9.4%	56	1.4%
2 mutations	26	7.7%	18	3.4%	18	0.5%
3 mutations	28	8.3%	10	1.9%	5	0.1%
4 mutations	40	11.9%	10	1.9%	3	0.1%
5 mutations	28	8.3%	7	1.3%	1	0.0%
6 mutations	18	5.4%			1	0.0%
7 mutations	7	2.1%				
8 mutations	2	0.6%				
Number of NNRTI-associated resistance mutations						
0 mutations	144	42.9%	206	38.6%	559	14.2%
1 mutation	53	15.8%	38	7.1%	81	2.1%
2 mutations	35	10.4%	32	6.0%	32	0.8%
3 mutations	11	3.3%	7	1.3%	12	0.3%
4 mutations	5	1.5%			5	0.1%
5 mutations	2	0.6%			1	0.0%
6 mutations	1	0.3%				
Number of PI-associated resistance mutations						
0 mutations	68	20.2%	101	18.9%	401	10.2%
1 mutation	62	18.5%	76	14.2%	96	2.4%
2 mutations	40	11.9%	47	8.8%	63	1.6%
3 mutations	15	4.5%	32	6.0%	73	1.9%
4 mutations	17	5.1%	13	2.4%	39	1.0%
5 mutations	16	4.8%	7	1.3%	14	0.4%
6 mutations	10	3.0%	1	0.2%	0	0.0%
7 mutations	4	1.2%	4	0.7%	2	0.1%
8 mutations	4	1.2%	2	0.4%	1	0.0%
9 mutations	3	0.9%			1	0.0%
10 mutations	2	0.6%				
11 mutations	2	0.6%				
12 mutations	4	1.2%				
13 mutations	5	1.5%				

11.3.7 Probability of development of resistance

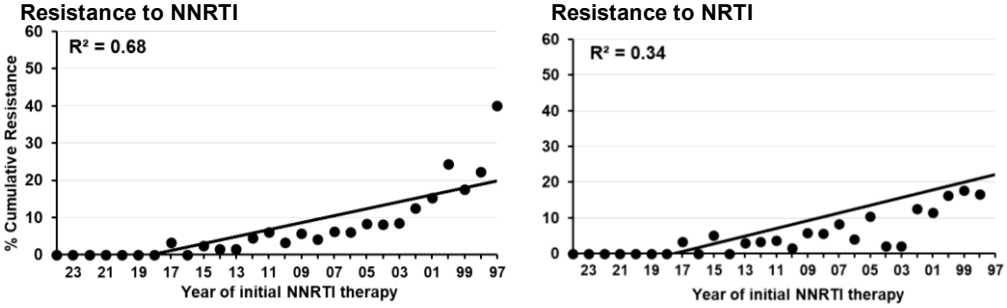
11.3.7.1 Any ART regimen



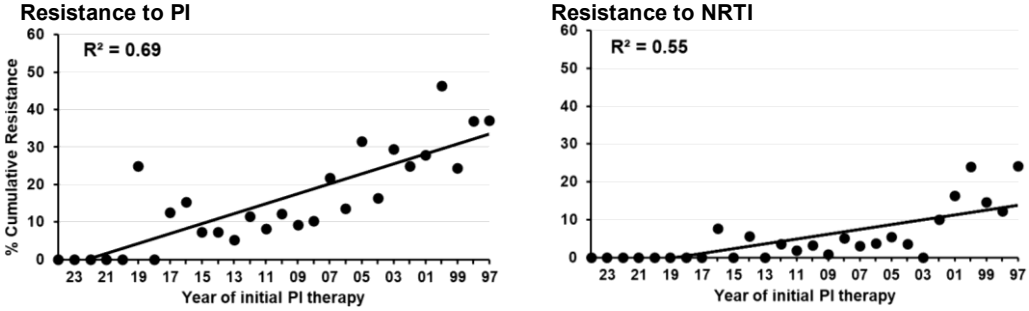
11.3.7.2 Any ART regimen and initial ART after January 1, 1997



11.3.7.3 Initial ART with 2 NRTI + 1 NNRTI

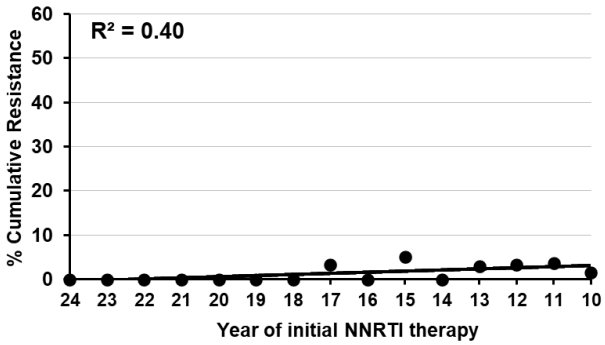


11.3.7.4 Initial ART with 2 NRTI + 1 PI

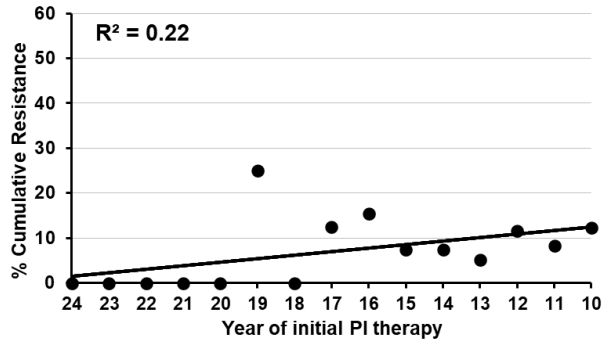


11.3.7.5 Development of resistance to NRTI, ART after January 2010

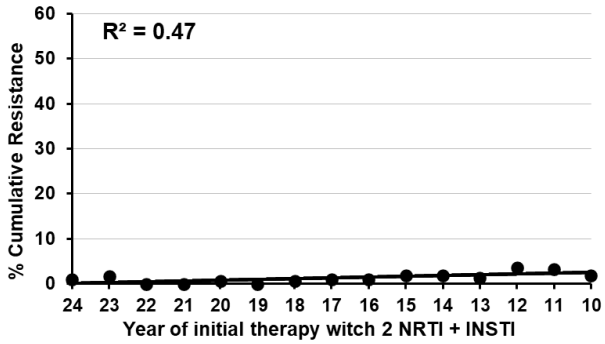
A) ART with 2 NRTI + 1 NNRTI



B) ART with 2 NRTI + 1 PI



C) ART mit 2 NRTI + 1 INSTI



11.3.8 Risk factors for the development of resistance

11.3.8.1 Patients with 3-class-resistance

All centres	All deaths after 1996	AIDS related deaths after 1996	AIDS related deaths after 1996 and ART > 6 months	Patients currently in care and ART use ever
	N = 2044	N = 533	N = 457	N = 4823
3-class-resistance	136 (6.7%)	38 (7.1%)	38 (8.3%)	161 (3.3%)

3-class-resistance	Patients currently in care and ART use ever N = 161
Age (years; mean ± S. D.)	58.4 ± 11.0
Federal states	
Carinthia	1 (0.6%)
Upper Austria	33 (20.5%)
Salzburg	10 (6.2%)
Styria	11 (6.8%)
Tyrol	21 (13.0%)
Vienna	52 (32.3%)
Other federal states	33 (20.5%)
Foreign countries	0 (0.0%)
Sex/ Mode of transmission	
MSM	53 (32.9%)
Male IDU	9 (5.6%)
Female IDU	12 (7.5%)
Male heterosexual	35 (21.7%)
Female heterosexual	39 (24.2%)
Others	13 (8.1%)
AIDS	78 (48.4%)
CD4 nadir (cells/µl; mean ± S. D.)	126.7 ± 124.0
Current CD4 cell counts (cells/µl; mean ± S. D.)	645.5 ± 317.4
Last HIV-RNA	
≤50 copies/ml	144 ± (89.4%)
51-199 copies/ml	13 (5.6%)
≥200 copies/ml	20 (5.0%)
Duration of ART (months; mean ± S. D.)	301.0 ± 80.6

All centres						**Model 1 (N = 4823)**		
	Frequencies N=		Univariable regression			**Multivariable regression***		
Variable	161 / 4823	(3.3%)	OR (95% CI)		p-value	**OR (95% CI)**		**p-value**
Demographic characteristics								
Age at ART start								
<30 years	61 / 1211	(5.0%)	6.0	2.6 - 13.9	<0.001	**2.5**	**1.0 - 6.2**	**0.040**
30-50 years	94 / 2930	(3.2%)	3.7	1.6 - 8.6	0.002	**2.0**	**0.8 - 4.7**	**0.122**
>50 years	6 / 682	(0.9%)	1			**1**		
Sex/ mode of transmission								
Male IDU	9 / 343	(2.6%)	1.1	0.5 - 2.2	0.856			
Female IDU	12 / 166	(7.2%)	3.1	1.6 - 5.9	0.001			
Male heterosexual	35 / 905	(3.9%)	1.6	1.0 - 2.5	0.035			
Female heterosexual	39 / 991	(3.9%)	1.6	1.1 - 2.5	0.024			
Other	13 / 263	(4.9%)	2.1	1.1 - 3.8	0.022			
MSM	53 / 2155	(2.5%)	1					
Population size of area of residence								
Missing value	0 / 2	(0.0%)	-	-	-			
Rural areas	72 / 2292	(3.1%)	1.0	0.7 - 1.5	0.884			
Capital cities	37 / 830	(4.5%)	1.5	1.0 - 2.3	0.075			
Vienna	52 / 1699	(3.1%)	1					
Stage of disease								
AIDS								
Yes	78 / 1104	(7.1%)	3.3	2.4 - 4.6	<0.001			
No	83 / 3719	(2.2%)	1					
CD4 nadir								
Missing value	0 / 6	(0.0%)	-	-	-	**-**	**-**	**-**
<50 cells/µl	56 / 721	(7.8%)	6.4	4.2 - 9.8	<0.001	**3.5**	**2.2 - 5.6**	**<0.001**
50-199 cells/µl	68 / 1247	(5.5%)	4.4	2.9 - 6.6	<0.001	**2.2**	**1.4 - 3.4**	**<0.001**
≥200 cells/µl	37 / 2849	(1.3%)	1			**1**		
Current HIV RNA								
Missing value	0 / 34	(0.0%)	-	-	-	**-**	**-**	**-**
≤50 copies/ml	144 / 4470	(3.2%)	0.4	0.2 - 0.8	0.007	**0.3**	**0.1 - 0.7**	**0.004**
51-199 copies/ml	9 / 224	(4.0%)	0.5	0.2 - 1.2	0.117	**0.4**	**0.1 - 1.4**	**0.157**
≥200 copies/ml	8 / 95	(8.4%)	1			**1**		
ART								
ART initiation								
Before 1.1.1997	84 / 336	(25.0%)	37.3	24.7 - 56.5	<0.001	**29.1**	**18.6 - 45.5**	**<0.001**
1.1.1997 to 31.12.2002	42 / 534	(7.9%)	9.6	6.0 - 15.1	<0.001	**7.6**	**4.7 - 12.2**	**<0.001**
Since 1.1.2003	35 / 3953	(0.9%)	1			**1**		

*adjusted for the variables: sex/ mode of transmission, population size of area of residence

11.3.8.2 Patients with any resistance (ART start since 1.1.1997)

All centres	All deaths after 1996		AIDS related deaths after 1996		AIDS related deaths after 1996 and ART > 6 months		Patients currently in care and ART use ever after 1996	
	N = 1676		N = 439		N = 364		N = 4487	
Any resistance	322	(19.2%)	82	(18.7%)	82	(22.5%)	567	(12.6%)

Any resistance	Patients currently in care and ART use ever after 1996 N = 567	
Age (years; mean ± S. D.)	34.3 ± 9.8	
Federal states		
Carinthia	17	(3.0%)
Upper Austria	78	(13.8%)
Salzburg	47	(8.3%)
Styria	61	(10.8%)
Tyrol	74	(13.1%)
Vienna	190	(33.5%)
Other federal states	95	(16.8%)
Foreign countries/ missing	5	(0.9%)
Sex/ Mode of transmission		
MSM	175	(30.9%)
Male IDU	54	(9.5%)
Female IDU		
Male heterosexual	113	(19.9%)
Female heterosexual	165	(29.1%)
Others	20	(3.5%)
AIDS	210	(37.0%)
CD4 nadir (cells/µl; mean ± S. D.)	115.8 ± 165.0	
Current CD4 cell counts (cells/µl; mean ± S. D.)	680.4 ± 331.8	
Last HIV-RNA		
≤50 copies/ml	501	(88.4%)
51-199 copies/ml	40	(7.1%)
≥200 copies/ml	26	(4.6%)
Duration of ART (months; mean ± S. D.)	210.9 ± 84.4	

All centres						**Model 1 (N = 4487)**		
	Frequencies N=			Univariable regression			**Multivariable regression**	
Variable	567 /	4487	(12.6%)	OR (95% CI)		p-value	**OR (95% CI)**	**p-value**
Demographic characteristics								
Age at ART start								
<30 years	193 /	1079	(17.9%)	3.4	2.4 - 4.9	<0.001	**3.0 2.0 - 4.3**	**<0.001**
30-50 years	334 /	2739	(12.2%)	2.2	1.6 - 3.1	<0.001	**1.7 1.2 - 2.4**	**0.003**
>50 years	40 /	669	(6.0%)	1			**1**	
Sex/ mode of transmission								
Male IDU	54 /	303	(17.8%)	2.3	1.7 - 3.2	<0.001	**2.0 1.4 - 2.8**	**<0.001**
Female IDU	40 /	131	(30.5%)	4.7	3.1 - 7.0	<0.001	**2.8 1.8 - 4.3**	**<0.001**
Male heterosexual	113 /	861	(13.1%)	1.6	1.3 - 2.1	<0,001	**1.4 1.1 - 1.8**	**0.013**
Female heterosexual	165 /	918	(18.0%)	2.3	1.9 - 2.9	<0.001	**1.9 1.5 - 2.4**	**<0.001**
Other	20 /	233	(8.6%)	1.0	0.6 - 1.6	0.996	**0.7 0.4 - 1.2**	**0.161**
MSM	175 /	2041	(8.6%)	1			**1**	
Population size of area of residence								
Missing value	0 /	2	(0.0%)	-	-	-	**- - -**	**-**
Rural areas	261 /	2135	(12.2%)	1.0	0.8 - 1.3	0.788	**1.1 0.8 - 1.3**	**0.646**
Capital cities	116 /	758	(15.3%)	1.3	1.0 - 1.7	0.024	**1.5 1.1 - 1.9**	**0.007**
Vienna	190 /	1592	(11.9%)	1			**1**	
Stage of disease								
AIDS								
Yes	210 /	958	(21.9%)	2.5	2.1 - 3.0	<0.001		
No	357 /	3529	(10.1%)	1				
CD4 nadir								
Missing value	0 /	6	(0.0%)	-	-	-	**- - -**	**-**
<50 cells/µl	139 /	641	(21.7%)	2.9	2.3 - 3.7	<0.001	**2.5 2.0 - 3.3**	**<0.001**
50-199 cells/µl	190 /	1091	(17.4%)	2.2	1.8 - 2.7	<0.001	**1.6 1.3 - 2.0**	**<0.001**
≥200 cells/µl	238 /	2749	(8.7%)	1			**1**	
Current HIV RNA								
Missing value	0 /	34	(0.0%)	-	-	-	**- - -**	**-**
≤50 copies/ml	501 /	4151	(12.1%)	0.3	0.2 - 0.5	<0.001	**0.3 0.2 - 0.5**	**<0.001**
51-199 copies/ml	40 /	213	(18.8%)	0.6	0.3 - 1.0	0.047	**0.6 0.3 - 1.1**	**0.117**
≥200 copies/ml	26 /	89	(29.2%)	1			**1**	
ART								
ART initiation								
1.1.1997 to 31.12.2002	213 /	534	(39.9%)	6.7	5.5 - 8.3	<0.001	**5.6 4.5 - 7.0**	**<0.001**
Since 1.1.2003	354 /	3953	(9.0%)	1			**1**	

12 Co-morbidities and Co-medication

12.1 Co-morbidities related to age

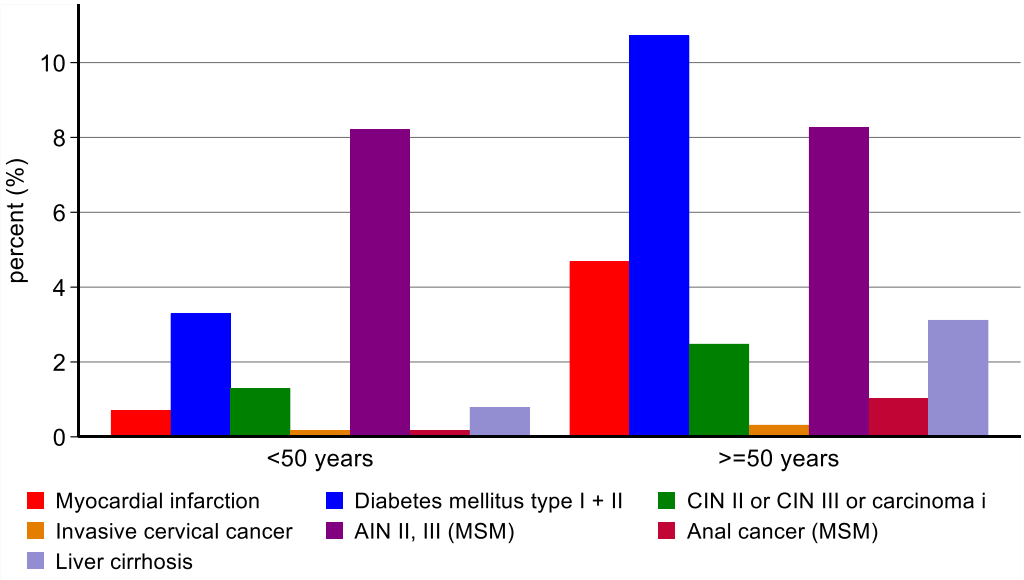
One aim of the Austrian HIV Cohort Study is to document co-morbidities and adverse drug reactions, as well as to investigate possible associations with ART. As a first step, important co-morbidities are illustrated.

Cumulative incidence in patients with a follow-up in the last 12 months (co-morbidities ever documented)

	< 50 years									
	Male IDU		Female IDU		Male hetero		Female hetero		MSM	
Number of patients	198	%	83	%	295	%	499	%	1141	%
Hypertension	18	9.1	4	4.8	34	11.5	44	8.8	83	7.3
Coronary heart disease	2	1.0	1	1.2					7	0.6
Myocardial infarction	1	0.5	1	1.2	2	0.7			11	1.0
Stroke	3	1.5	1	1.2	2	0.7	4	0.8	3	0.3
Diabetes mellitus type I + II	8	4.0	2	2.4	18	6.1	19	3.8	25	2.2
CIN II or CIN III or carcinoma in situ			3	3.6			27	5.4		
Invasive cervical cancer							4	0.8		
St. p. hysterectomy							5	1.0		
Anal intraepithelial neoplasia II, III	5	2.5	1	1.2	10	3.4	4	0.8	195	17.1
Anal cancer					1	0.3			4	0.4
Osteoporosis	3	1.5			5	1.7	9	1.8	12	1.1
Liver cirrhosis	11	5.6	2	2.4	1	0.3	2	0.4	2	0.2
Attempted suicide or suicide	4	2.0	2	2.4	2	0.7	1	0.2	12	1.1
Drug overdose (mainly opiates)	6	3.0	4	4.8			1	0.2	6	0.5
Chronic kidney disease	2	1.0	1	1.2	5	1.7	9	1.8	13	1.1

	≥ 50 years									
	Male IDU		Female IDU		Male hetero		Female hetero		MSM	
Number of patients	200	%	104	%	655	%	549	%	1173	%
Hypertension	56	28.0	20	19.2	225	34.4	161	29.3	350	29.8
Coronary heart disease	28	14.0	13	12.5	83	12.7	31	5.6	135	11.5
Myocardial infarction	9	4.5	5	4.8	29	4.4	11	2.0	72	6.1
Stroke	17	8.5	8	7.7	19	2.9	12	2.2	31	2.6
Diabetes mellitus type I + II	16	8.0	9	8.7	100	15.3	56	10.2	104	8.9
CIN II or CIN III or carcinoma in situ			14	13.5			55	10.0		
Invasive cervical cancer			3	2.9			5	0.9		
St. p. hysterectomy			12	11.5			36	6.6		
Anal intraepithelial neoplasia II, III	4	2.0	7	6.7	26	4.0	14	2.6	233	19.9
Anal cancer			3	2.9	5	0.8	3	0.5	29	2.5
Osteoporosis	33	16.5	27	26	61	9.3	86	15.7	107	9.1
Liver cirrhosis	25	12.5	14	13.5	10	1.5	9	1.6	23	2.0
Attempted suicide or suicide	9	4.5	3	2.9	6	0.9	2	0.4	13	1.1
Drug overdose (mainly opiates)	11	5.5	7	6.7	3	0.5	1	0.2	6	0.5
Chronic kidney disease	12	6.0	23	22.1	49	7.5	69	12.6	59	5.0

Comparison of co-morbidities in different age groups

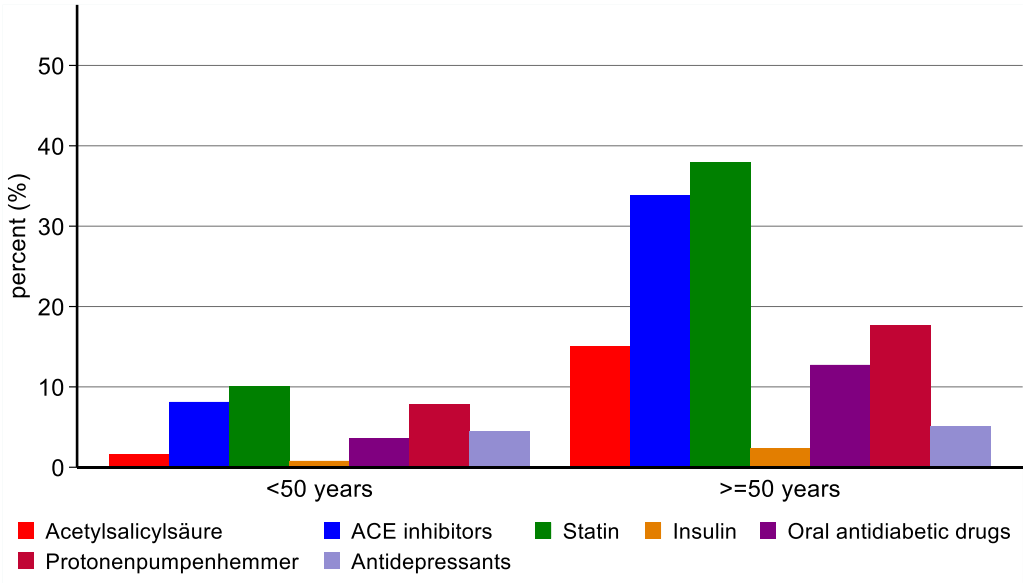


12.2 Co-medication related to age

	< 50 years									
	Male IDU		Female IDU		Male hetero		Female hetero		MSM	
Current therapies	198	%	83	%	295	%	499	%	1141	%
Acetylsalicylic acid	6	3.0	2	2.4	6	2.0	4	0.8	18	1.6
ACE inhibitors/angiotensin antagonists	17	8.6	5	6.0	32	10.8	36	7.2	87	7.6
Beta blocker	13	6.6	4	4.8	11	3.7	13	2.6	44	3.9
Statin	18	9.1	6	7.2	43	14.6	41	8.2	115	10.1
Insulin	2	1.0			7	2.4	3	0.6	6	0.5
Oral antidiabetic drugs	10	5.1	6	7.2	21	7.1	20	4.0	23	2.0
Proton pump inhibitors	33	16.7	17	20.5	24	8.1	39	7.8	62	5.4
Bisphosphonates	2	1.0			1	0.3	1	0.2	2	0.2
Thyroid hormones	2	1.0	6	7.2	7	2.4	35	7.0	18	1.6
Opiate substitution	111	56.1	51	61.4	17	5.8	7	1.4	15	1.3
Psychotropic drugs	136	68.7	65	78.3	49	16.6	76	15.2	210	18.4
Anxiolytics, hypnotics, sedatives	45	22.7	32	38.6	12	4.1	15	3.0	43	3.8
Antidepressants	40	20.2	22	26.5	21	7.1	46	9.2	133	11.7
Antipsychotics	38	19.2	19	22.9	9	3.1	30	6.0	71	6.2

≥ 50 years										
	Male IDU		Female IDU		Male hetero		Female hetero		MSM	
Current therapies	200	%	104	%	655	%	549	%	1173	%
Acetylsalicylic acid	45	22.5	17	16.3	111	16.9	56	10.2	181	15.4
ACE inhibitors/angiotensin antagonists	66	33.0	22	21.2	270	41.2	168	30.6	392	33.4
Beta blocker	32	16.0	12	11.5	125	19.1	70	12.8	210	17.9
Statin	65	32.5	40	38.5	272	41.5	217	39.5	434	37.0
Insulin	6	3.0	1	1.0	22	3.4	13	2.4	20	1.7
Oral antidiabetic drugs	19	9.5	7	6.7	122	18.6	59	10.7	136	11.6
Proton pump inhibitors	44	22.0	29	27.9	112	17.1	87	15.8	207	17.6
Bisphosphonates	1	0.5	5	4.8	12	1.8	26	4.7	25	2.1
Thyroid hormones	16	8.0	18	17.3	32	4.9	75	13.7	72	6.1
Opiate substitution	108	54.0	59	56.7	28	4.3	16	2.9	41	3.5
Psychotropic drugs	134	67.0	73	70.2	133	20.3	145	26.4	315	26.9
Anxiolytics, hypnotics, sedatives	51	25.5	33	31.7	25	3.8	35	6.4	55	4.7
Antidepressants	48	24.0	30	28.8	64	9.8	87	15.8	192	16.4
Antipsychotics	25	12.5	13	12.5	31	4.7	44	8.0	65	5.5

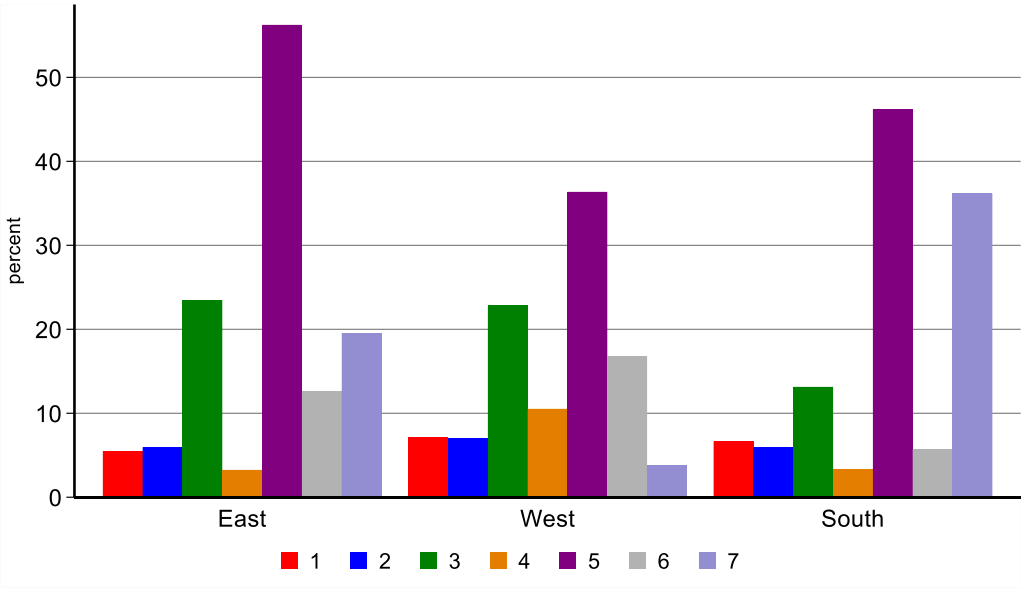
Comparison of co-medications in the different age groups



12.3 Examples of quality assurance

"Quality assurance"	Fulfilled	Total	%
LDL cholesterol documented within the last 12 months	4915	5217	94.2%
LDL > 160 mg/dl (1*)	311	4915	6.3%
Smoking history documented	4891	5217	93.8%
Smoking	2204	4891	45.1%
LDL > 160 mg/dl & smoking in those 50 years and above (2*)	67	2696	2.5%
Blood pressure documented within the last 12 months	5130	5217	98.3%
Arterial hypertension (3*)	1112	5130	21.7%
Smoking among those with arterial hypertension	373	1112	33.5%
Coronary heart disease (CHD) or MI or ICP stenting (4*)	315	5217	6.0%
No statin use among patients with CHD (5*)	133	315	42.2%
Diabetes or Glucose >200 or HbA1c	381	5217	7.3%
Diabetes and recent HbA1c > 8 (6*)	52	381	13.6%
Hepatitis C RNA pos. within the last 12 months	112	5217	2.1%
No syphilis screening in the last 6 months in MSM (7*)	374	2328	16.1%

*Conditions (numbers in parentheses) are shown in the figure (legend) below



13 Summary

HIV Patient Management System

The Austrian HIV Cohort Study uses its own electronic health record, the *HIV Patient Management System,* which is the common tool for the HIV Cohort. The data input is done decentralized in the HIV centres. The input of laboratory results is done mostly electronically, and in every centre various professional groups are involved in data entry. Before data sets are merged, the cohort participants have been made anonymous. Therefore, it is very laborious to identify cohort participants who are/ were treated in more than just one treatment centre. This cannot be done by using personal data such as initials, date of birth or postal code, but with HIV specific data (date of the HIV test, CD4 cell counts etc.).

On the one hand, the *HIV Patient Management System* fulfills complex tasks for the clinical management of HIV infected patients, and on the other hand it allows queries and analyses to be performed by the users without restrictions. However, to allow both individual patient management and scientific queries is an enormous challenge which scientific HIV cohorts in other countries have not had to deal with. While for the clinical patient management the focus is on readability of diagnoses and therapies, creation of medical reports, prescriptions (trade names!), print-out of results etc., scientific queries need precise coding and categorization. Furthermore, the optimization of individual patient management requires an ongoing adjustment to the progress of information technology, whereas purely scientific data bases do not have such technological renewal pressure. However, in Austria, there was no acceptance for a purely scientific data base.

Patients with a follow-up in the last 12 months

The highest number of cohort participants are seen at the AKH Vienna (27.0%), followed by the OWS Vienna (15.5%), Innsbruck (14.5%), Linz (13.8%), Graz (9.7%), Salzburg (6.9%), Klagenfurt (5.1%), Favoriten Vienna (4.6%) and Feldkirch (2.9%). However, a considerable proportion 27.9%) of patients did not have a follow-up within the last 12 months. The main reasons for this „loss of follow-up“ is the transfer of care to health-care providers outside the hospital based HIV-centres of AHIVCOS and the substantial number of individuals who have left the country.

Who and how many are infected with HIV in Austria?

The median age at diagnosis has been between 30 and 40 years since 1990. 25.2% of the patients with a follow-up in the last 12 months are female. The rate is highest in Burgenland (33.7%), Upper Austria (30.2%), Styria (26.9%) and Vorarlberg (26.4%).
In the subgroup of heterosexually acquired infections, the rate of the women is 52.4%. It is highest in Styria (57.4%), Upper Austria (56.3%) and Burgenland (55.1%). Among patients newly diagnosed in 2025, 28.6% have been infected through heterosexual contacts. Since 2000, 34.8% of all newly diagnosed HIV infections were transmitted through heterosexual contacts.

Most of the cohort participants are Austrian nationals (67.8%). 8.1% come from high prevalence countries and 21.6% from low prevalence countries outside Austria. Information on the nationality of the remaining patients is missing.
According to the Dachverband der Sozialversicherungsträger, the proportion of PLHIV in AHIVCOS in relation to the total number of PLHIV in Austria will be 63% in 2024. Assuming that the participants in AHIVCOS are representative of the whole of Austria, an extrapolation of the total number of PLHIV in Austria based on the PLHIV figure from AHIVCOS (= 7936) would result in a figure of 12600. This is clearly an overestimate, as the recording of PLHIV who have left Austria is incomplete.

A reliable estimate of the total number of PLHIV in Austria can be extrapolated from the number of people receiving ART in Austria. This figure was 8258 for 2024, which, for 92.16% (=96%x96%) on ART among PLHIV in AHIVCOS, would result in a total of 8960 PLHIV for the whole of Austria. With a confidence interval with the low limit for the number of diagnosed individuals and the proportion of them on ART, we arrive at 86.5% (93% x 93%) on ART among all PLHIV, which would result in a possible maximum total number of 9550 PLHIV in the whole of Austria.

Is the HIV test used efficiently?

Austria has one of the highest rates of HIV tests per capita in Europe. Nevertheless, a substantial number of patients (~25%) is already immune deficient (CD4 cell count <200/µl) at the time of the first contact with an HIV centre.

Therefore, risk factors for an “early“ and a “late“ diagnosis have been evaluated. Patients who have been diagnosed with HIV between 2001 and 2025 were analysed. During this period, 7711 HIV infections were newly diagnosed. The infections occurred in 34.6% through heterosexual transmission, in 45.2% through MSM and in 13.9% through IDU.

An “early“ diagnosis is defined by: a seroconversion illness (westernblot pattern or antigen/HIV RNA with corresponding clinical symptoms) or documented seroconversion with negative test not more than 3 years before the first positive HIV test.

A “late“ diagnosis is defined by: CD4<350 at time of HIV diagnosis and/or AIDS within 3 months of HIV diagnosis.

15.9% of the examined patients had an “early“ diagnosis and 42.0% a “late“ diagnosis.

A higher risk to be diagnosed “late” was found in older patients (>50), in those who have been infected heterosexually and male IDU compared to MSM and in persons originating not from Austria.

An „early“ diagnosis was found more frequently in younger patients (<50), MSM, in patients originating from Austria and in persons residing in places with less than 1 million inhabitants.

Transmission of drug resistant HIV

In all centres, 285 (7.0%) of 4083 patients were identified who had at least one resistance mutation before their first antiretroviral therapy. Two patients had a 3-class resistance to NRTI, NNRTI and PI before starting ART. Ten patients had a resistance to NRTI and PI, eight patients had a resistance to NRTI and NNRTI, and five patients had a resistance to NNRTI and PI. The transmission of drug resistant HI viruses has decreased in the last years. However, not all centres did resistance tests before ART initiation or at diagnosis, but most have implemented the routine testing in 2003.

Stage of HIV disease

The cohort participants represent all stages of HIV infection. Half of the patients have a CD4 nadir <200/µl. The median of the CD4 nadir of the patients with a visit in the last 12 months is 249/µl. The current CD4 cell count is 698/µl (median at the last measurement). As of September 1st, 2025, about 3.3% of the patients with a visit in the last 12 months had a current CD4 cell count below 200/µl and 12 (0.2%) of them had a CD4 cell count <50/µl. The mean CD4 cell count is currently 728/µl. Therefore, the number of patients with an opportunistic infection will remain low in the following years.

Mortality

The reduction of mortality after the implementation of antiretroviral combination therapies is impressive (see items 10.1, 10.2 and 10.3). In 1994, the death rate of patients with AIDS was 40.6 per 100 person-years for men and 44.4 for women. Over the last years the rate decreased to below 5 for men and for women. From 2005 to 2024 (except for the year 2006), injecting drug users had a higher death rate than homosexual men. Only in 2006 the death rate of homosexual men was higher than for IDU.

Viral suppression under antiretroviral therapy

The rate of viral suppression under antiretroviral therapy in Austria is similar to figures from other countries. However, it has to be considered that the rate of viral suppression has been measured with the patients currently in care and that patients with "loss of follow-up" are not included.

Increase of CD4 cell counts during antiretroviral therapy

The CD4 cells during antiretroviral therapy have continuously increased, and the increase continues after 5 and 7.5 years of ART initiation. The increase is faster in patients on continuous ART compared to patients with treatment interruptions (see item 10.3.2).

Development of resistances during antiretroviral therapy

The probability of developing resistance to antiretroviral drugs seems to be decreasing (chapter 12.3.7). So, the risk of „any" resistance after more than 25 years of ART is about 40%, for NRTI-associated resistance about 20% and for 3-class resistance 10%. The probability of NNRTI-associated resistance after more than 25 years is about 20% in patients who started ART with NNRTIs. The probability of PI-associated resistance after 20 years is about 35% in patients who had a PI-based antiretroviral combination therapy as their initial therapy. The results are about the same if transmitted resistances are excluded.

The strongest risk factor for the development of 3-class-resistance during antiretroviral therapy is initiation of ART before 1997 as well as from 1997 to 2003, followed by low CD4 nadir.

In our cohort, 48 patients of 9420 (0.5%) have a mutation of the codon 65 of the RT (K65R). The occurrence of the mutation K65R was more frequent in regimens including Tenofovir compared with Abacavir and could be found more often in patients with advanced immune deficiency (low CD4 nadir/ AIDS; chapter 12.3.1.2) as well as in women infected heterosexually.

Co-infections

Co-infections with syphilis, hepatitis B, and hepatitis C are common. Like in other European countries, an enormous increase of new syphilis infections, especially among MSM, is apparent. This indicates a lack of prevention and "Safer Sex" practices. However, it is necessary to note that an increased "*sero-sorting*" behaviour (sexual contacts with partners with the same HIV status) could have substantially contributed to this increase.

In Austria, infection with hepatitis C is still uncommon in MSM. Not all patients are offered vaccination against hepatitis B, although it is recommended for all HIV infected persons.

Co-morbidities

Improved survival has shifted the health care towards more individuals older than 50 years. The medical needs of older HIV-infected patients may differ from those of younger patients. Older individuals, with new or longstanding HIV infection, are at greater risk for non-HIV-related morbidities. Of special concern are cardiovascular diseases, osteoporosis, liver and neuropsychiatric disorders. Thus, aging of the HIV-infected population under care will lead to more complex medical management and increased costs of care. Health care agencies need to be aware of the impact of this important change in near future.

Outlook

The report of the Austrian HIV Cohort Study is still representative of the epidemiology of HIV/AIDS in Austria and therefore serves as source of data for the ECDC in Stockholm. It can be well compared with other reports from Austria, such as the report of renal replacement therapy of the Austrian Society for Nephrology and Austrotransplant. Moreover, the establishment of the *HIV Patient Management System* has played an important role to improve clinical care for persons with HIV/AIDS *(„Good Clinical Chronic Disease Practice").*

Some remaining problems are mainly due to inconsistent use of the *HIV Patient Management System* with the corollary of inconsistent data entry into this software. Regular updates and improvements of the *HIV Patient Management System* should help to face these challenges.

The development of the HIV Patient Management System incorporated the international standard format, the HIV Cohorts Data Exchange Protocol (HICDEP). Therefore, data merging with international networks of cohorts like RESPOND and ART-CC has been and will be greatly facilitated.

14 Glossary

A	Austria
Ab	Antibody
ACE	Angiotensin-converting enzyme
AGES	Austrian Agency for Health and Food Safety
AHIVCOS	Austrian HIV Cohort Study
ART	Antiretroviral therapy (HIV-therapy)
ARVs	Antiretrovirals
ATC-Code	Anatomical therapeutic-chemical code
B	Burgenland
betw.	between
BMSGPK	Bundesministerium für Soziales, Gesundheit, Pflege und Konsumentenschu
C	Carinthia
cART	Combination antiretroviral therapy
CDC	Centers for Disease Control
CHD	Coronary heart disease
CIN	Cervical intraepithelial neoplasia
CIS	Commonwealth of Independent States
ECDC	European Centre for Disease Prevention and Control
EuroHIV	European Centre for the Epidemiological Monitoring of AIDS
GP	General practitioner
HBA1c	Hemoglobin A1c
HBV	Hepatitis B virus
HCV	Hepatitis C virus
HDL	High density lipoprotein
Hetero	Heterosexually acquired infection
HIP	HIV-Patient-Management-System
IAS	International AIDS-Society
ICD	International Classification of Diseases (WHO)
IDU	Injecting drug users
INSTI	Integrase strand transfer inhibitor
Interm.	Intermediate
KFJ	Kaiser-Franz-Josef-Spital Wien/Kaiser-Franz-Josef-Hospital Vienna
LA	Lower Austria
LDL	Low density lipoprotein
m.	month(s)
MI	Myocardial infarction
MSM	Men who have sex with men
N.a.	Not available/ not applicable
n.s.	not significant
neg.	negative
NNRTI	Non Nucleoside Reverse Transcriptase Inhibitor
NRTI	Nucleoside Reverse Transcriptase Inhibitor
OWS	Otto-Wagner-Spital Wien/Otto-Wagner Hospital Vienna
P	Protease
PI	Protease inhibitor
RNA	Ribonucleic acid
RT	Reverse transcriptase
S	Salzburg
SD/ s.d.	Standard deviation
St	Styria
St. p.	Status post
T	Tyrol
UA	Upper Austria
UK	United Kingdom
Vertical	Vertical transmission
Vie	Vienna
Vo	Vorarlberg
WHO	World Health Organization
ys.	years

15 Austrian HIV Cohort Study Group

As of November 2025

Steering committee members: Alexander Egle, Martin Gisinger, Katharina Grabmeier-Pfistershammer, Manfred Kanatschnig, Michael Knappik, Angela Öllinger, Armin Rieger, Elmar Wallner, Robert Zangerle
Coordination: Robert Zangerle
Funding: Austrian Agency for Health and Food Safety (AGES), Hospitals running HIV treatment centres, international cohort collaborations (RESPOND, ART-CC) pharmaceutical companies (equal contributions, irrespective of their market shares)
HIV treatment centres, *site coordinating physicians: (LKH Innsbruck) Jan Borch, Martin Gisinger*, Alexander Plattner, Maria Reich. (LKH Salzburg) Arno Beer, Alexander Egle*, Carmen Lehner, Michaela Schachner. (Kepler Universitätsklinikum Med Campus III. Linz) Florian Bernhard, Angela Öllinger*, Matthias Skocic, Monika Müller. (AKH Vienna) Regina Aichwalder, Wolfgang Bauer, David Chromy, Katharina Grabmeier-Pfistershammer*, Veronique Touzeau. (Penzing Hospital Vienna) Piotr Cichon, Simon Daller, Michael Knappik*, Moritz Koch, Sonja Wolf-Nussmüller, Elena Sohani. (Favoriten Hospital Vienna) Christina Groza, Alexander Zoufaly*. (LKH Graz II, Standort West) Christina Genger-Hackl, Elisabeth Trattner, Elmar Wallner*. (LKH Klagenfurt) Manfred Kanatschnig*, Dominic Vais. (LKH Feldkirch) Laila Raschid*
Virology: Elisabeth Puchhammer-Stöckl (Vienna), Heribert Stoiber (Innsbruck)
Data management: Heinz Appoyer (IT-related), Maria Kitchen (AHIVCOS), Gisela Leierer (Medical University of Innsbruck), Michaela Rappold (AHIVCOS), Stefanie Strickner (AHIVCOS), Robert Zangerle (AHIVCOS)
Data safety and protection: Klaus Schindelwig (Innsbruck)
Scientific advisory board: Gerd Fätkenheuer (Cologne), Bruno Ledergerber (Zurich)

Verein Österreichische HIV-Kohortenstudie
c/o Univ.-Prof. Dr. Robert Zangerle
HIV-Bereich
Universitätsklinik für Dermatologie, Venerologie und Allergologie
Anichstraße 35
6020 Innsbruck

E-Mail: lki.ha.hiv-kohorte@tirol-kliniken.at

AUTHORS:
Gisela Leierer
Michaela Rappold
Stefanie Strickner
Robert Zangerle