HIV/AIDS in Austria

42nd Report of the Austrian HIV Cohort Study

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HIV / AIDS
in Austria

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Austrian HIV Cohort Study

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1 Introduction

At the end of the year 2001, representatives of 5 Austrian HIV treatment centres (AKH Vienna, Otto-Wagner-Hospital Vienna, AKH Linz, LKH Innsbruck and LKH Graz West) have founded the **„Austrian HIV Cohort Study (AHIVCOS)“**. In 2008, two more centres (LKH Salzburg and LKH Klagenfurt), in 2016 one more centre (Kaiser-Franz-Josef-Hospital Vienna) and in 2018 one more centre (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.

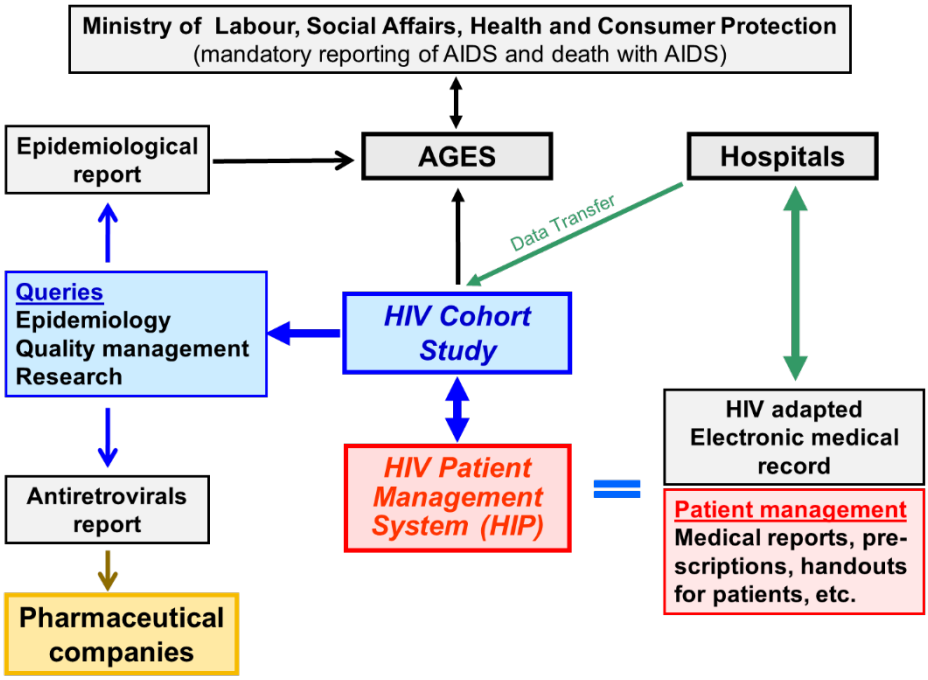
On the one hand, the *HIP* fulfils complex tasks for the clinical management of HIV infected patients, and on the other hand it allows queries and analyses to be performed by the users without restrictions. However, to allow both individual patient management and scientific queries is an enormous challenge 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

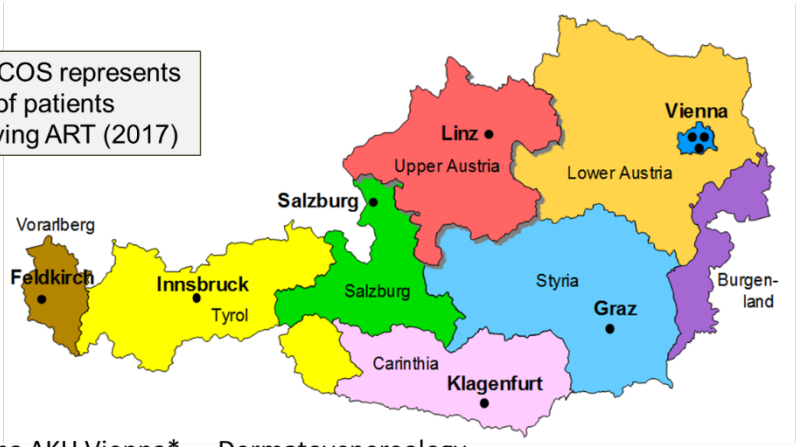
2 Organization of the Austrian HIV cohort study

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 Labour, Social Affairs, Health and Consumer Protection (BMASGK, Department IX/A/7, Dr. Bernhard Benka) 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 BMG 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 AKH Vienna*	Dermatovenereology
OWS Vienna	Pulmonary Medicine
KFJ Vienna	Infectious Diseases
■ Graz	Infectious Diseases
■ Linz**	Dermatovenereology
■ Salzburg**	Oncology/Infectious Diseases
■ Klagenfurt	Oncology
■ Innsbruck*	Dermatovenereology
■ Feldkirch (2018)	Oncology

* University Hospitals
** University in development or associated with private university

3 Funding

The Austrian HIV Cohort Study (AHIVCOS) will be financed until September 2022. The maintenance and the further development of the ***HIV Patient Management System ("HIP")*** as well as the provision of epidemiological reports ***(e.g. „Report of the Austrian HIV Cohort Study")*** are secured with the public sector (AGES, by order of the Federal Ministry of Health), the partners in the pharmaceutical industry (all companies providing HIV drugs) and the participating hospitals (routine maintenance contracts).

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.

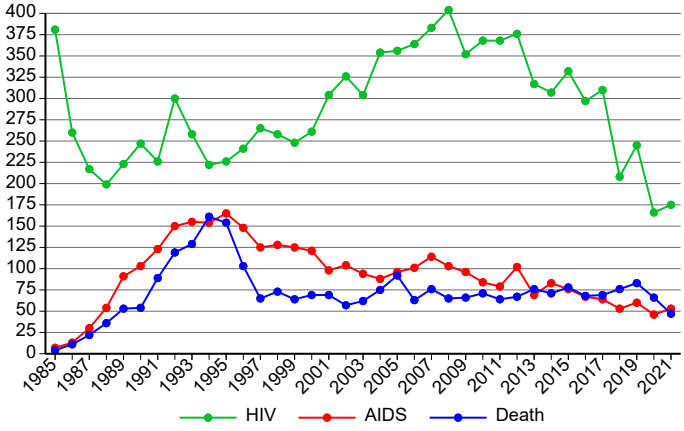
Minimal dataset:

- 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)

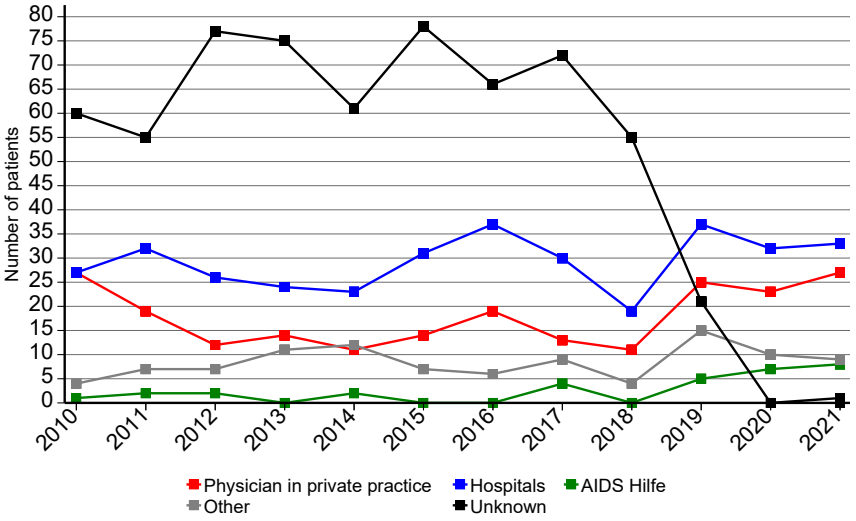
4.2 HIV, AIDS and Death per calendar year

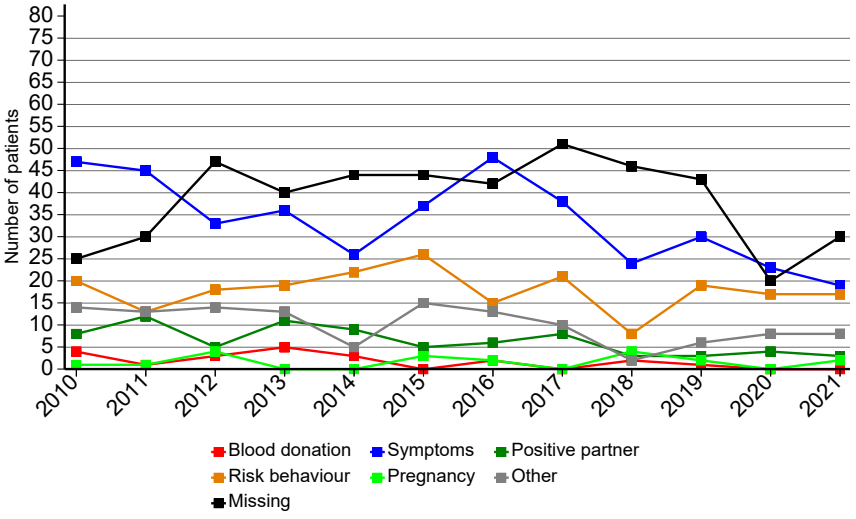


Year	HIV	AIDS	DEATH
1985	381	7	4
1986	260	13	11
1987	217	30	22
1988	199	54	36
1989	223	91	53
1990	247	103	54
1991	226	123	89
1992	300	150	119
1993	258	155	129
1994	222	154	161
1995	226	165	154
1996	241	148	103
1997	265	125	65
1998	258	128	73
1999	248	125	64
2000	261	121	69
2001	304	98	69
2002	326	104	57
2003	304	94	62
2004	354	88	75
2005	356	96	92
2006	364	101	63
2007	383	114	76
2008	404	103	65
2009	352	96	66
2010	368	84	71
2011	368	79	64
2012	376	102	67
2013	317	69	76
2014	307	83	71
2015	332	76	78
2016	297	67	68
2017	310	64	69
2018	208	53	76
2019	245	60	83
2020	166	46	66
2021	175	53	47
2022	16	7	1
Total	**10664**	**3429**	**2668**

4.3 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.





4.4 Recruitment and follow-up of cohort participants

So far, 10664 HIV infected patients providing 116541.06 years of follow-up have been recruited into the cohort study. We assume that there were more than 2668 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

	OWS Vienna	AKH Vienna	KFJ Vienna	Linz	Salz-burg	Inns-bruck	Feld-kirch	Graz	Klagen-furt	Total
01.03.2022	2747	3218	250	1212	529	1458	124	810	316	**10664**

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**
OWS Vienna	846	60	739	**1645**
AKH Vienna	1354	76	1205	**2635**
KFJ Vienna	188	10	46	**244**
Linz	652	12	160	**824**
Salzburg	296	44	144	**484**
Innsbruck	740	223	91	**1054**
Feldkirch	96	4	17	**117**
Graz	487	19	195	**701**
Klagenfurt	223	12	57	**292**
Total	**4882**	**460**	**2654**	**7996**

	Death		**Total**
	Death within the last 12 months	Death since more than 12 months	
OWS Vienna	13	1089	**1102**
AKH Vienna	13	570	**583**
KFJ Vienna	0	6	**6**
Linz	1	387	**388**
Salzburg	3	42	**45**
Innsbruck	6	398	**404**
Feldkirch	1	6	**7**
Graz	0	109	**109**
Klagenfurt	0	24	**24**
Total	**37**	**2631**	**2668**

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

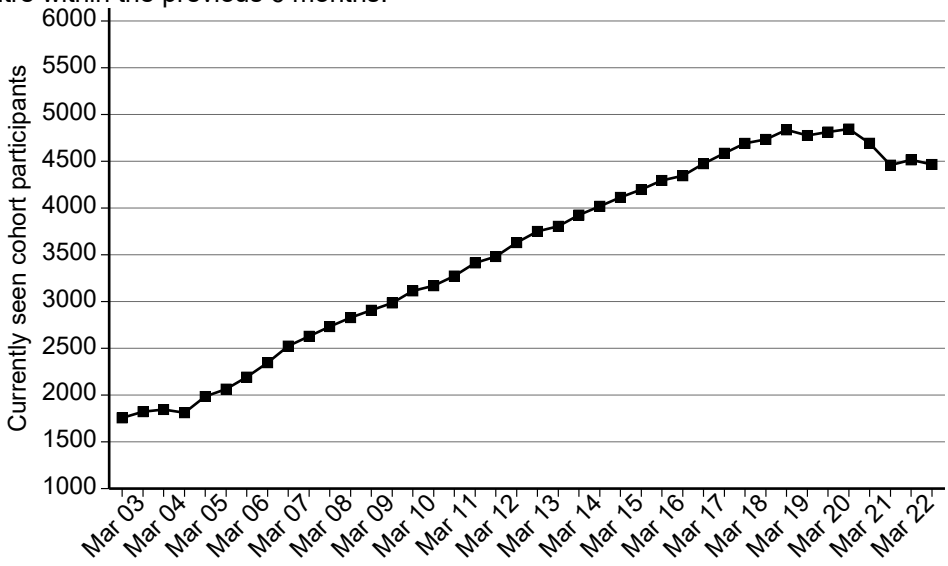
Persons with residency abroad were excluded from this analysis.

All centres	Frequencies		%	Univariable logistic Regression			Multivariable logistic Regression		
Variable	2654	7536	35.22%	**OR**	**(95%CI)**	**p-value**	**OR**	**(95%CI)**	**p-value**
Demographic characteristics									
Age at last contact									
< 30	534	749	71.30%	11.12	[9.24,13.39]	0.000	9.13	[7.48,11.15]	0.000
30-50	1621	4054	39.99%	2.98	[2.66,3.35]	0.000	2.59	[2.29,2.94]	0.000
> 50	499	2733	18.26%	1.00	[1.00,1.00]	.	1.00	[1.00,1.00]	.
HIV transmission category									
Male IDU	284	693	40.98%	1.23	[1.04,1.46]	0.015	1.18	[0.98,1.41]	0.077
Female IDU	108	306	35.29%	0.97	[0.76,1.24]	0.791	0.99	[0.76,1.30]	0.964
Male hetero	404	1322	30.56%	0.78	[0.68,0.89]	0.000	0.95	[0.81,1.11]	0.516
Female hetero	411	1357	30.29%	0.77	[0.67,0.88]	0.000	0.78	[0.66,0.91]	0.002
Other	237	502	47.21%	1.59	[1.31,1.92]	0.000	1.31	[1.05,1.64]	0.016
MSM	1210	3356	36.05%	1.00	[1.00,1.00]	.	1.00	[1.00,1.00]	.
Population size of residence area									
Vienna	1701	3583	47.47%	3.02	[2.74,3.34]	0.000	2.96	[2.66,3.30]	0.000
Missing	56	56	100.00%	1.00	[1.00,1.00]	.	1.00	[1.00,1.00]	.
Outside Vienna	897	3897	23.02%	1.00	[1.00,1.00]	.	1.00	[1.00,1.00]	.
Nationality									
High prevalence	358	781	45.84%	1.91	[1.64,2.22]	0.000	1.66	[1.37,1.99]	0.000
Low prevalence	610	1449	42.10%	1.64	[1.45,1.85]	0.000	1.25	[1.10,1.43]	0.001
Missing	88	107	82.24%	10.44	[6.33,17.20]	0.000	5.01	[2.87,8.73]	0.000
Austria	1598	5199	30.74%	1.00	[1.00,1.00]	.	1.00	[1.00,1.00]	.
Stage of disease									
AIDS									
Yes	1172	435	72.93%	0.62	[0.55,0.70]	0.000	0.84	[0.74,0.97]	0.015
No	3710	2219	62.57%	1.00	[1.00,1.00]	.	1.00	[1.00,1.00]	.

4.5 Patients currently in care

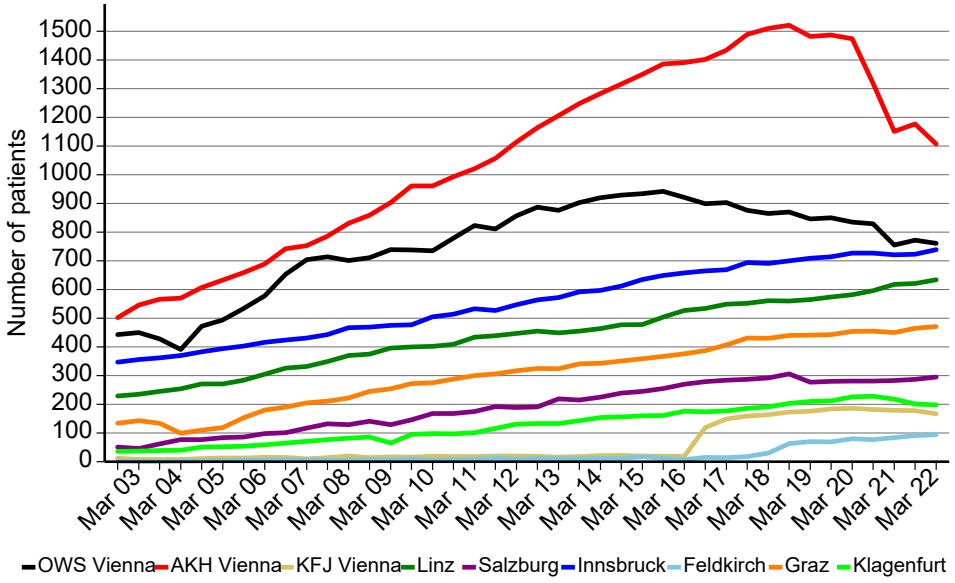
4.5.1 Overall

Patients were seen as currently in care when they had at least one contact to an HIV centre within the previous 6 months.



Number of patients currently in care

	OWS Vienna	AKH Vienna	KFJ Vienna	Linz	Salz-burg	Inns-bruck	Feld-kirch	Graz	Klagen-furt	Total
01.03.2022	761	1107	167	634	295	739	94	471	198	**4466**

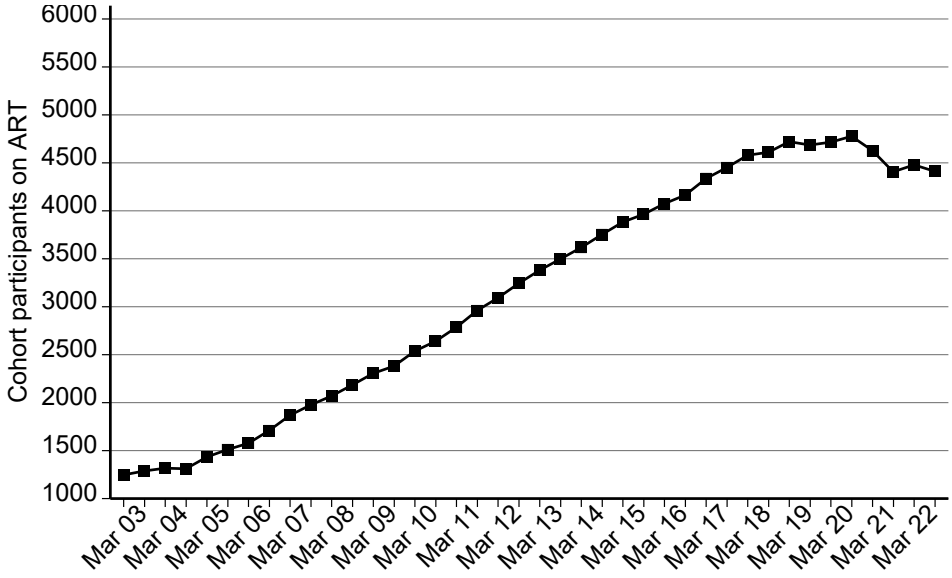


Number of currently seen patients by residence

	HIV-centre									
	OWS Vienna	AKH Vienna	KFJ Vienna	Linz	Salz-burg	Inns-bruck	Feld-kirch	Graz	Klagen-furt	**Total**
Burgenland	22	26	5	0	0	0	0	15	0	**68**
Carinthia	0	0	0	3	6	8	0	15	191	**223**
Lower Austria	173	201	15	43	1	3	1	3	0	**440**
Upper Austria	1	7	1	567	23	4	0	1	0	**604**
Salzburg	1	1	1	5	224	31	0	1	0	**264**
Styria	3	5	0	5	7	3	0	429	3	**455**
Tyrol	0	1	0	1	4	544	0	1	0	**551**
Vorarlberg	0	0	0	1	0	127	90	0	0	**218**
Vienna	560	865	142	6	1	8	0	5	1	**1588**
Foreign/missing	1	1	3	3	29	11	3	1	3	**55**
Total	**761**	**1107**	**167**	**634**	**295**	**739**	**94**	**471**	**198**	**4466**

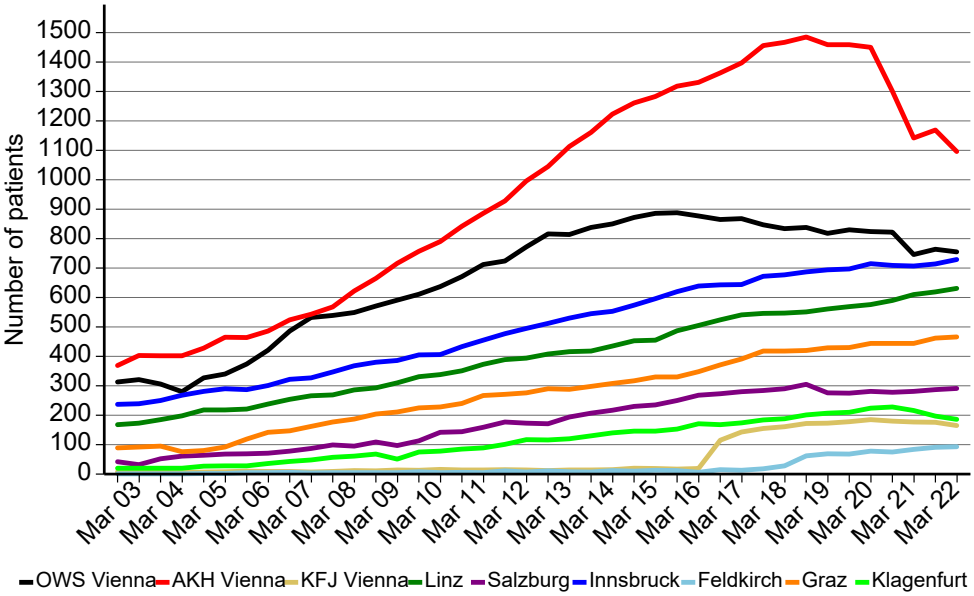
4.5.2 Number of patients currently on antiretroviral therapy

4412 patients (98.8%) were on antiretroviral therapy in the 9 HIV treatment centres. Of the 54 patients not on treatment 14 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

	OWS Vienna	**AKH Vienna**	**KFJ Vienna**	**Linz**	**Salz-burg**	**Inns-bruck**	**Feld-kirch**	**Graz**	**Klagen-furt**	**Total**
01.03.2022	755	1096	165	631	291	729	93	466	186	**4412**



Number of participants currently on antiretroviral therapy by area of residence

	HIV-centre									
	OWS Vienna	AKH Vienna	KFJ Vienna	Linz	Salz-burg	Inns-bruck	Feld-kirch	Graz	Klagen-furt	**Total**
Burgenland	22	26	5	0	0	0	0	15	0	**68**
Carinthia	0	0	0	3	6	8	0	15	180	**212**
Lower Austria	171	200	15	43	1	3	1	3	0	**437**
Upper Austria	1	7	1	564	23	4	0	1	0	**601**
Salzburg	1	1	1	5	220	31	0	1	0	**260**
Styria	3	5	0	5	7	3	0	424	2	**449**
Tyrol	0	1	0	1	4	536	0	1	0	**543**
Vorarlberg	0	0	0	1	0	126	89	0	0	**216**
Vienna	556	855	140	6	1	8	0	5	1	**1572**
Foreign/missing	1	1	3	3	29	10	3	1	3	**54**
Total	**755**	**1096**	**165**	**631**	**291**	**729**	**93**	**466**	**186**	**4412**

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

As of January 1st 2020, the modelling tool of ECDC reveals a number of 7655 PLHIV, assuming that AHIVCOS is representative for the whole of Austria, the number sums up to 10 000. This is very likely an overestimation, since the ascertainment of patients who left the country is incomplete.

According to *Hauptverband der Sozialversicherungsträger*, 7182 persons received cART in 2020. An analysis within AHIVCOS, based on the same method, revealed 5037 persons with cART in 2020 representing 70% of all patients in Austria receiving cART. Overall, we estimate, according to the ECDC tool, that about 86-93% of PLHIV are receiving cART. Thus, the estimate for PLHIV, based on the number given by the Hauptverband and the calculation of 80-85% receiving cART, add up to 7725-8350 PLHIV for end of 2020 (see also page 90).

4.6 Use of antiretroviral drugs to prevent HIV infection

PEP

	Non-occupational PEP started in						
	2016	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**
Sex							
Women	37	40	63	65	44	45	4
Men	107	133	161	263	150	180	21
Age (years)							
<30	64	97	114	164	103	126	10
30-48	72	71	103	150	84	94	13
≥50	8	5	7	14	7	5	2
Area of residence							
Vienna	74	99	127	191	106	120	12
Lower Austria	4	6	9	13	21	13	3
Burgenland	1	0	1	4	4	2	0
Upper Austria	3	15	17	25	11	31	4
Salzburg	0	7	8	10	2	3	0
Tyrol	23	11	23	29	29	30	3
Vorarlberg	2	1	2	3	4	3	0
Styria	10	7	14	17	8	10	2
Carinthia	0	0	1	1	0	0	0
Missing/Foreign	27	27	22	35	9	13	1

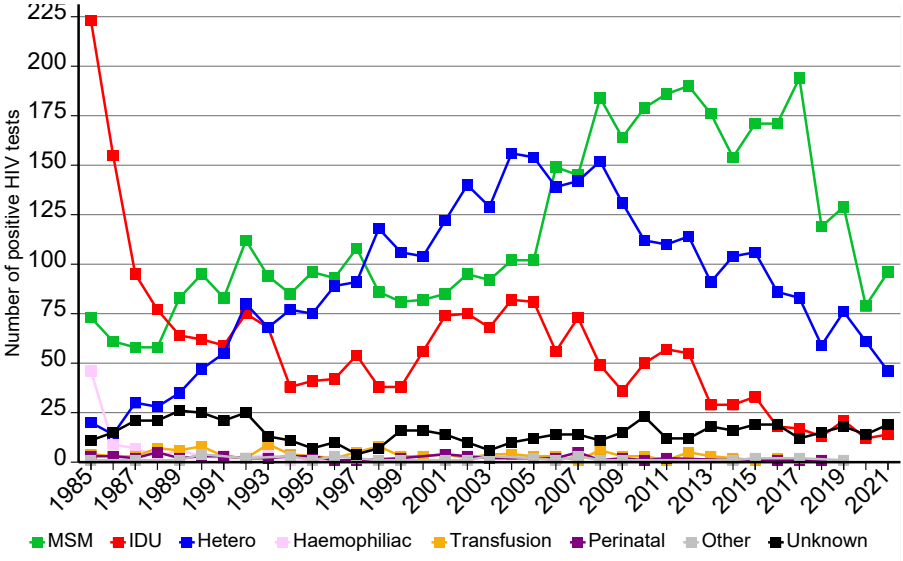
PrEP

	PrEP started in							
	2016	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**On PrEP at 01.03.2022**
Sex								
Women	0	0	3	8	4	2	2	16
Men	4	101	199	284	209	291	58	941
Age (years)								
<30	2	32	53	82	61	109	28	290
30-48	2	63	123	184	131	150	27	565
≥50	0	6	26	26	21	34	5	102
Area of residence								
Vienna	1	79	82	133	62	84	14	357
Lower Austria	0	5	9	11	10	7	1	38
Burgenland	0	0	0	3	1	4	0	8
Upper Austria	0	0	22	28	33	50	8	131
Salzburg	0	1	5	6	2	6	2	18
Tyrol	3	13	60	84	72	112	31	291
Vorarlberg	0	1	19	12	17	20	1	64
Styria	0	1	4	10	14	8	2	38
Carinthia	0	0	0	0	1	1	0	2
Missing/Foreign	0	1	1	5	1	1	1	10

5 HIV/AIDS Surveillance in Austria

5.1 Mode of transmission

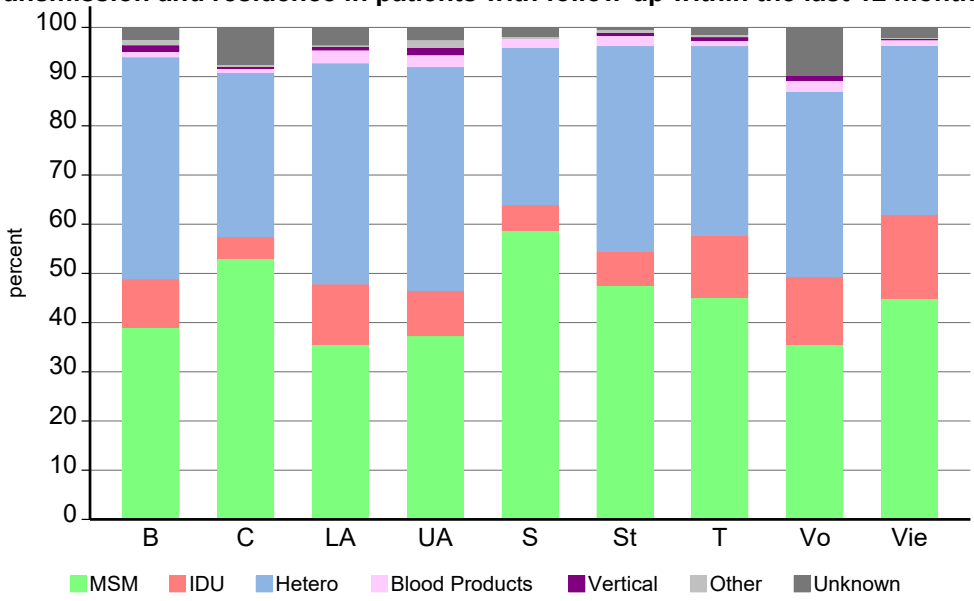
5.1.1 All modes of transmission



	BMG	AHIVCOS											
						Heterosexually							
Year	Total	MSM		IDU		infected		Others		Total	Women		
1998	313	86	33.33%	38	14.73%	118	45.74%	16	6.20%	258	60	23.26%	
1999	339	81	32.66%	38	15.32%	106	42.74%	23	9.27%	248	69	27.82%	
2000	428	82	31.42%	56	21.46%	104	39.85%	19	7.28%	261	74	28.35%	
2001	402	85	27.96%	74	24.34%	122	40.13%	23	7.57%	304	73	24.01%	
2002	442	95	29.14%	75	23.01%	140	42.94%	16	4.91%	326	92	28.22%	
2003	423	92	30.26%	68	22.37%	129	42.43%	15	4.93%	304	92	30.26%	
2004	470	102	28.81%	82	23.16%	156	44.07%	14	3.95%	354	107	30.23%	
2005	453	102	28.65%	81	22.75%	154	43.26%	19	5.34%	356	100	28.09%	
2006	435	149	40.93%	56	15.38%	139	38.19%	20	5.49%	364	88	24.18%	
2007	515	145	37.86%	73	19.06%	142	37.08%	23	6.01%	383	85	22.19%	
2008	505	184	45.54%	49	12.13%	152	37.62%	19	4.70%	404	95	23.51%	
2009	507	164	46.59%	36	10.23%	131	37.22%	21	5.97%	352	79	22.44%	
2010	487	179	48.64%	50	13.59%	112	30.43%	27	7.34%	368	68	18.48%	
2011	525	186	50.54%	57	15.49%	110	29.89%	15	4.08%	368	75	20.38%	
2012	523	190	50.53%	55	14.63%	114	30.32%	17	4.52%	376	74	19.68%	
2013	481	176	55.52%	29	9.15%	91	28.71%	21	6.62%	317	47	14.83%	
2014	403	154	50.16%	29	9.45%	104	33.88%	20	6.51%	307	65	21.17%	
2015	428	171	51.51%	33	9.94%	106	31.93%	22	6.63%	332	41	12.35%	
2016	447	171	57.58%	18	6.06%	86	28.96%	22	7.41%	297	49	16.50%	
2017	510	194	62.58%	17	5.48%	83	26.77%	16	5.16%	310	47	15.16%	
2018	397*	119	57.21%	13	6.25%	59	28.37%	17	8.17%	208	30	14.42%	
2019	430*	129	52.65%	21	8.57%	76	31.02%	19	7.76%	245	36	14.69%	
2020	332*	79	47.59%	12	7.23%	61	36.75%	14	8.43%	166	31	18.67%	
2021	376*	96	54.86%	14	8.00%	46	26.29%	19	10.86%	175	29	16.57%	
2022	-	8	50.00%	1	6.25%	3	18.75%	4	25.00%	16	0	0.00%	

*Numbers who have been tested, in chronological order (2018 – 2021): 74, 94, 49 and 66.

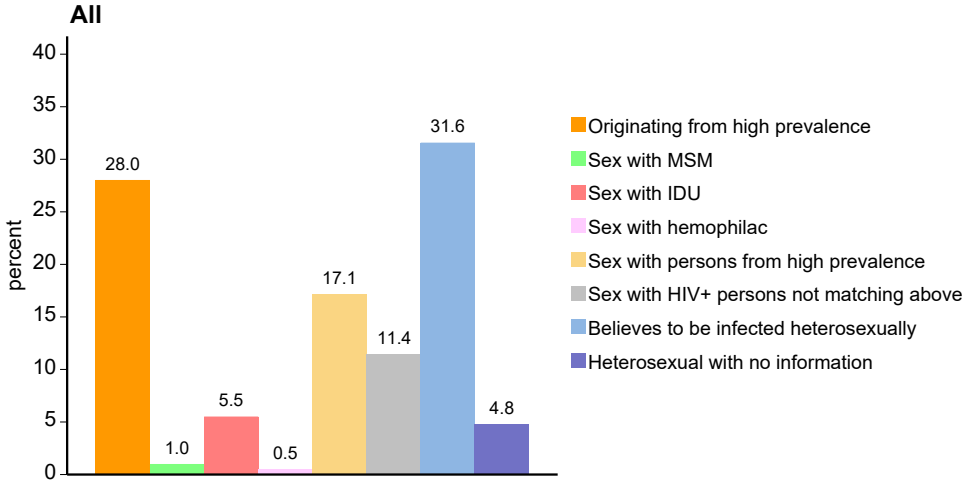
Transmission and residence in patients with follow-up within the last 12 months

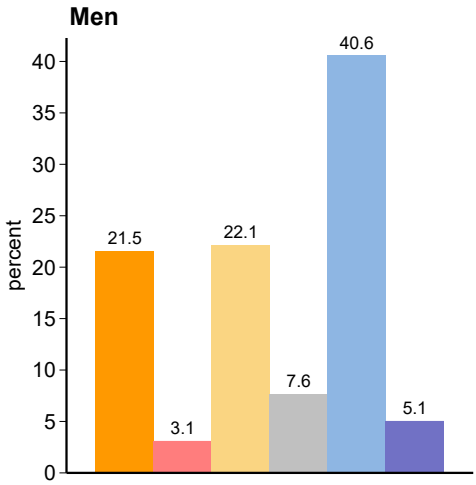


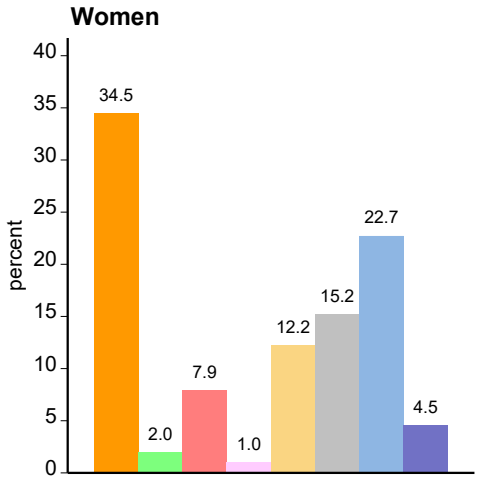
The abbreviation MSM is used for „Men who have sex with men". IDU means „Injecting Drug Use". The category IDU also includes men who are both MSM and IDU. The category "blood products" includes cohort participants who have received coagulation compounds or blood transfusions. Among the patients with a follow-up in the last 12 months, 38.2% have been infected through heterosexual contacts, 44.0% through homosexual contacts and 12.4% through the injection of drugs.

5.1.2 Categories of heterosexually acquired infections

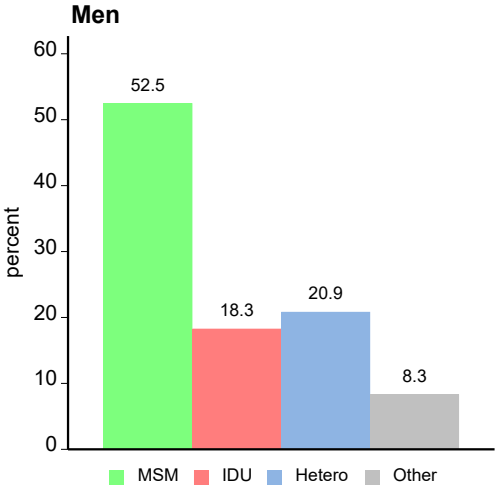
Because of missing data, the HIV treatment centre OWS Vienna has been excluded from some analyses.

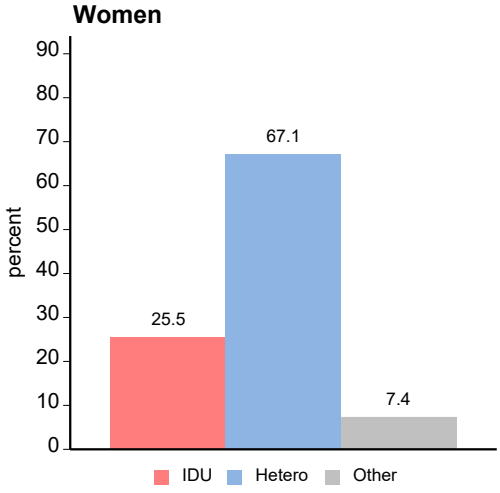




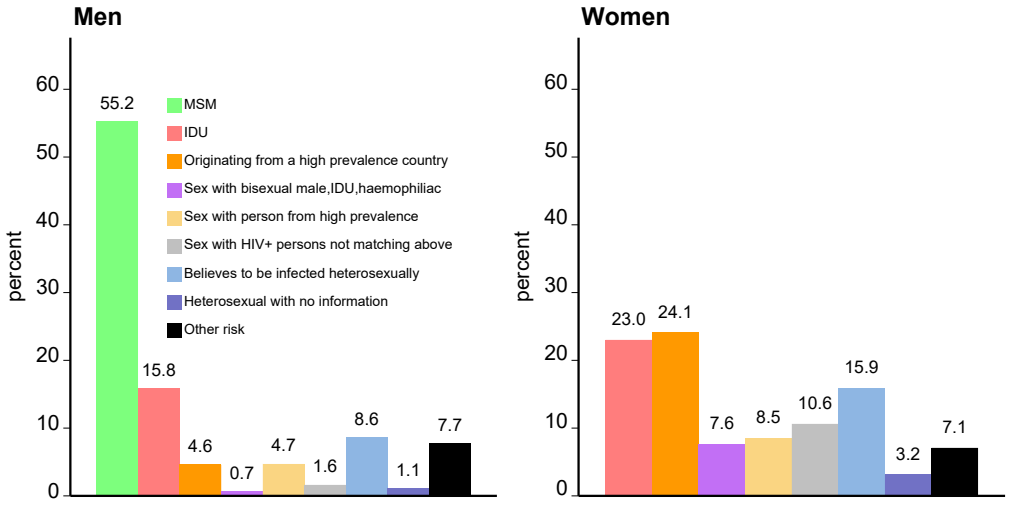


Categories of transmission

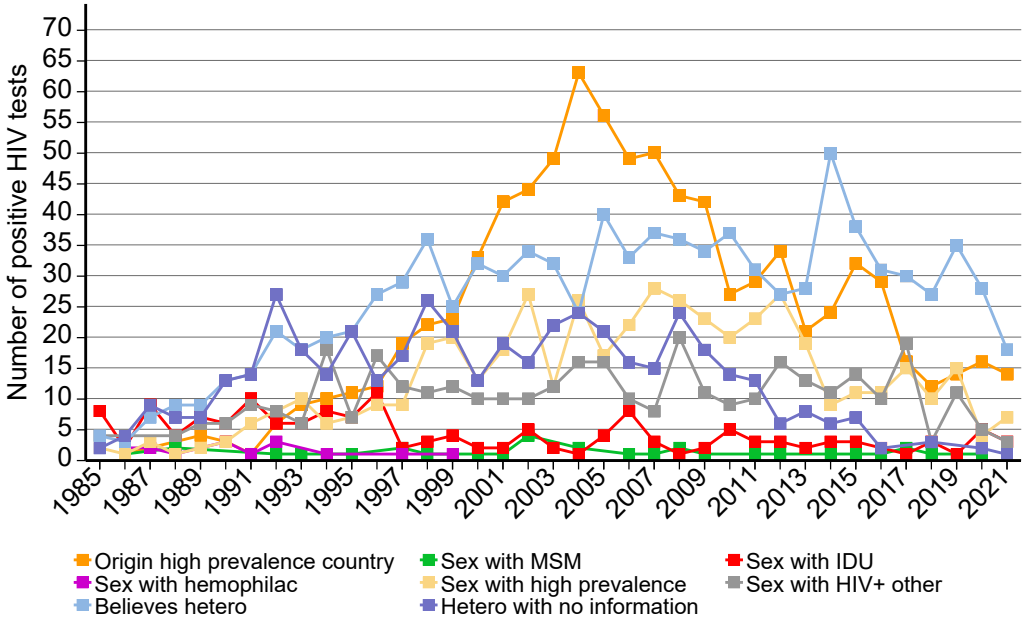




Sub-categories of transmission



Sub-categories of heterosexually acquired infections

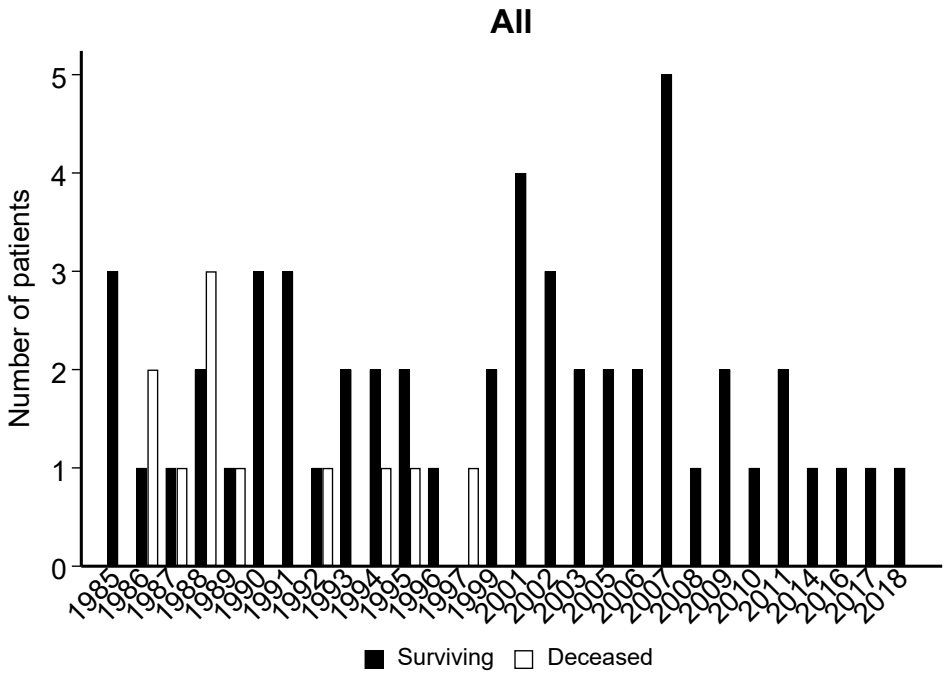


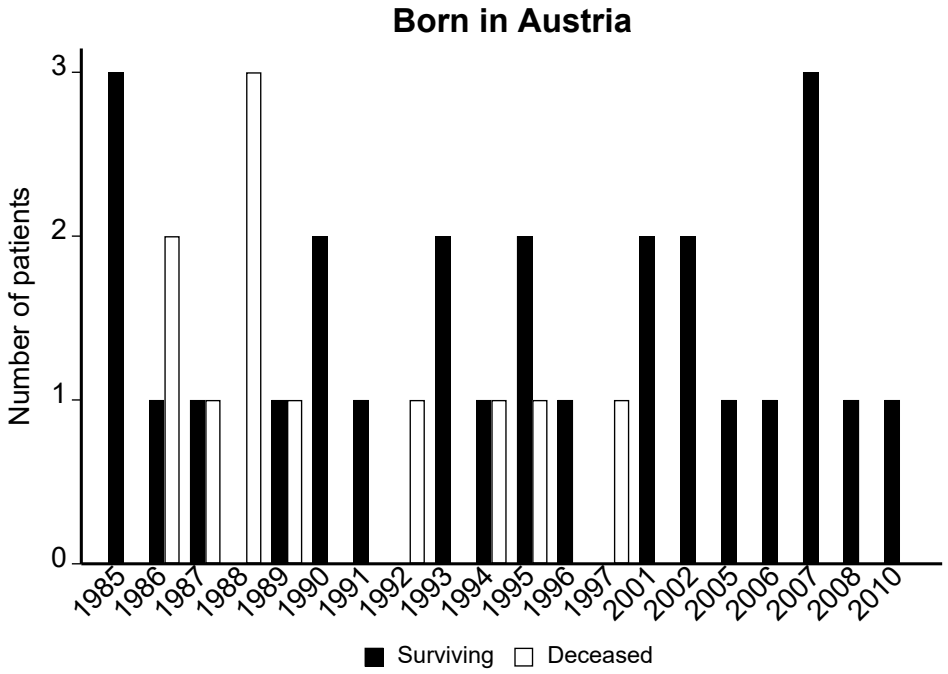
5.1.3 Mother-to-child-transmission

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.

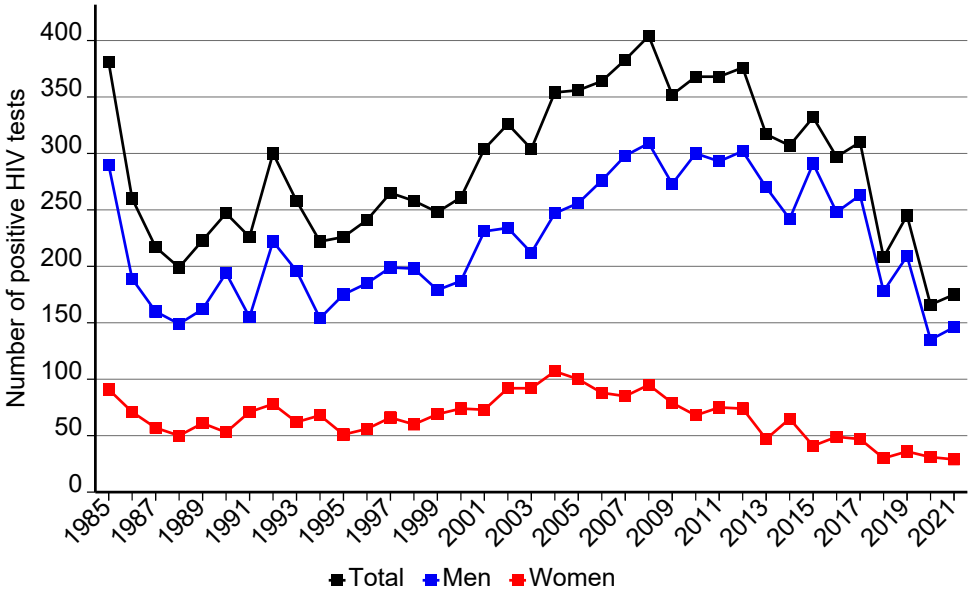
	Living participants		Deceased participants	Total
	<18 years	>18 years		
Burgenland	0	1	0	**1**
Carinthia	0	1	0	**1**
Lower Austria	1	4	0	**5**
Upper Austria	4	7	1	**12**
Salzburg	1	0	0	**1**
Styria	0	3	0	**3**
Tyrol	0	4	4	**8**
Vorarlberg	2	0	3	**5**
Vienna	6	15	3	**24**
Missing residency	0	1	0	**1**
Foreign	0	2	0	**2**
Total	**14**	**38**	**11**	**63**

In January 2010, routine HIV testing 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
2005
2006
2007
2008
2009
2010
2011
2014
2016
2017
2018
Surviving
Deceased

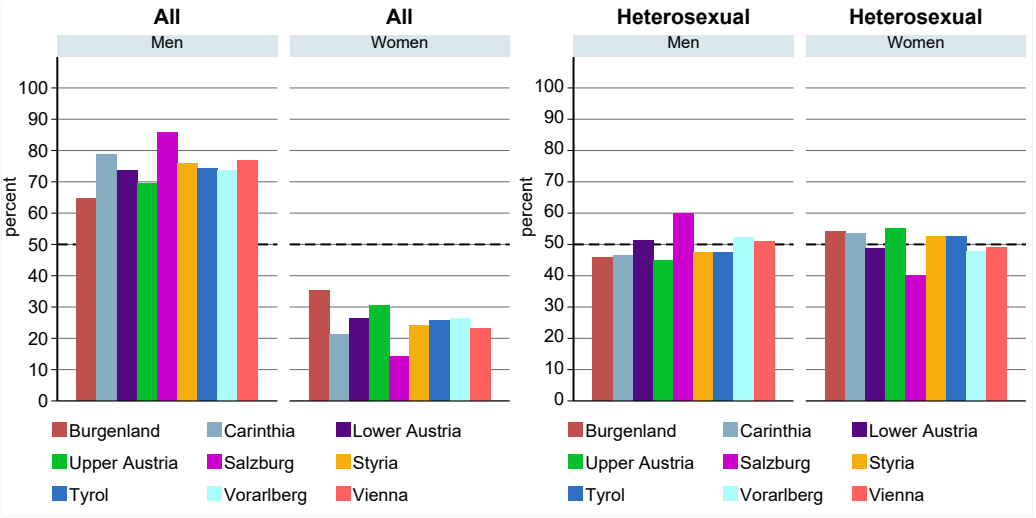

Born in Austria
Number of patients
0
1
2
3
1985
1986
1987
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
2001
2002
2005
2006
2007
2008
2010
Surviving
Deceased

5.2 Sex



8 transgender women are participating in the Austrian HIV cohort study.
24.7% of the patients with a follow-up within the last 12 months are female. The rate is highest in Burgenland (35.4%) and Upper Austria (30.7%).
In the subgroup of heterosexually acquired infections, the rate of the women is 50.8%. It is highest in Upper Austria (55.0%), Burgenland (54.1%) and Carinthia (53.6%).

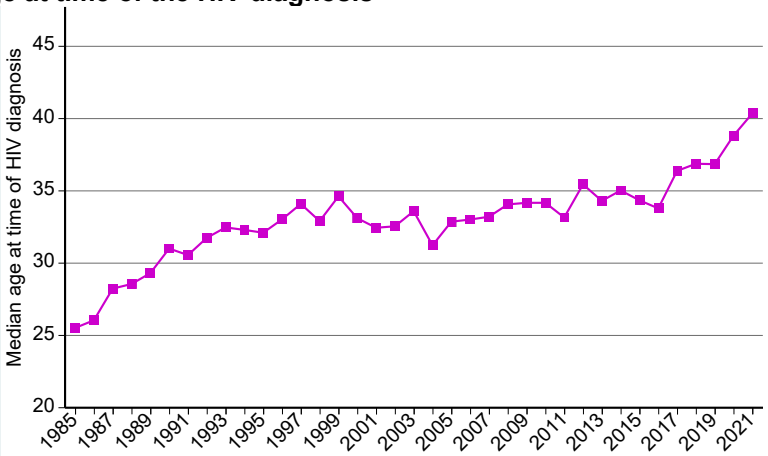
Sex of the patients with a follow-up in the last 12 months

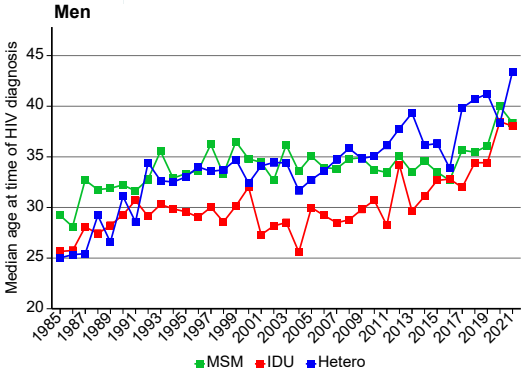


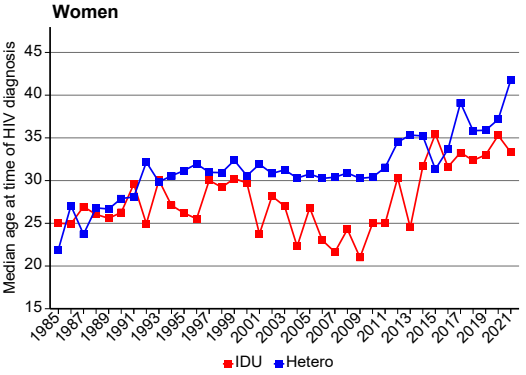
5.3 Age

5.3.1 Age at time of HIV diagnosis

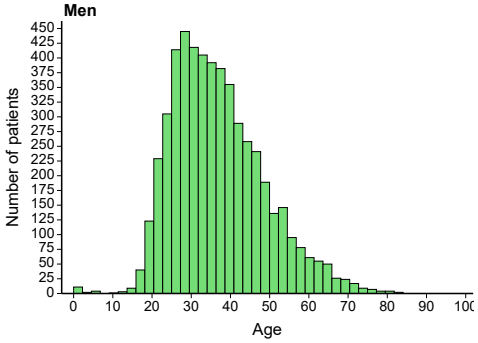
Median age at time of the HIV diagnosis

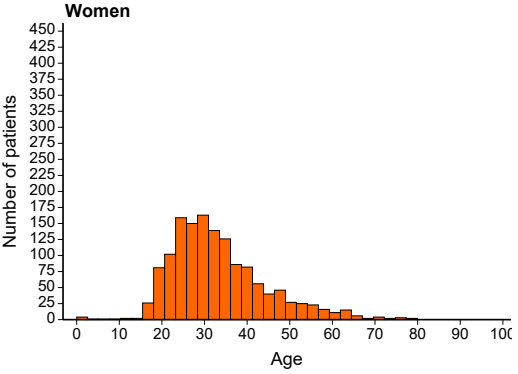


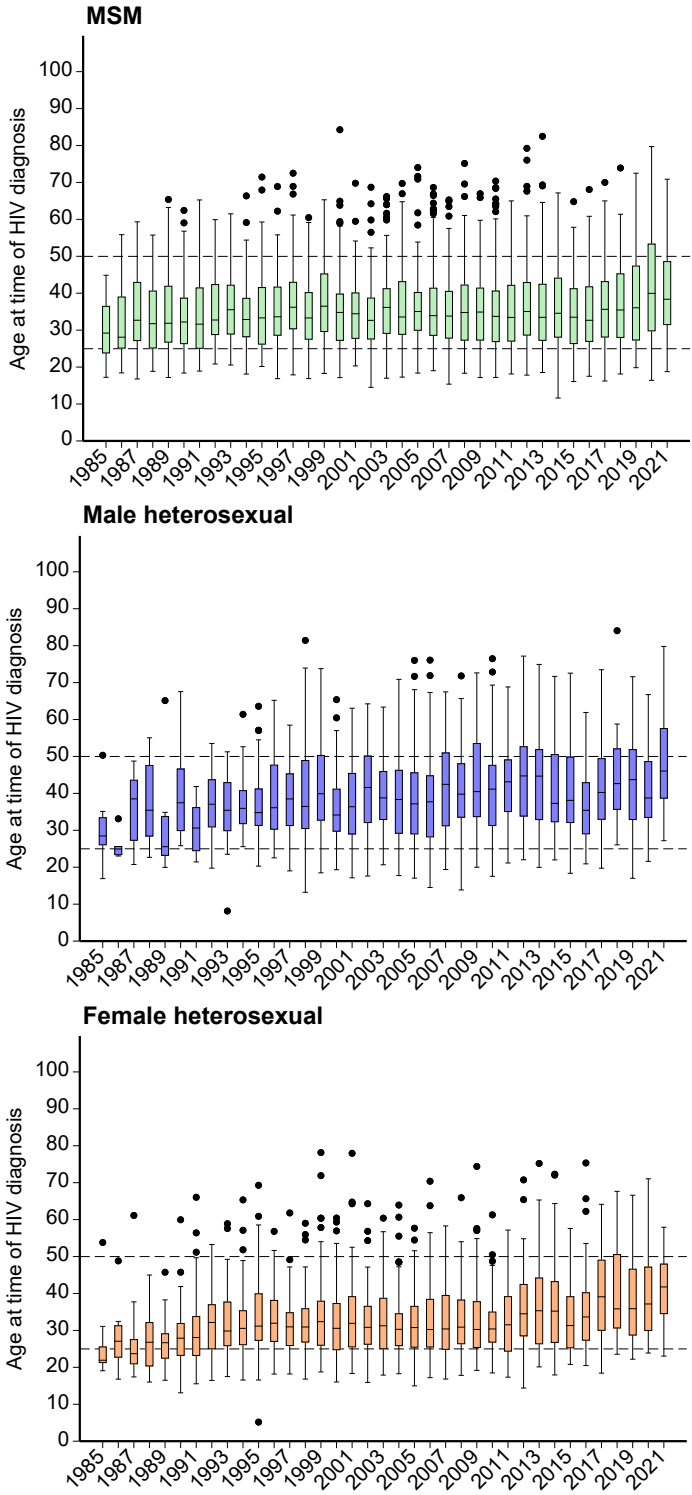




Age at time of the HIV diagnosis

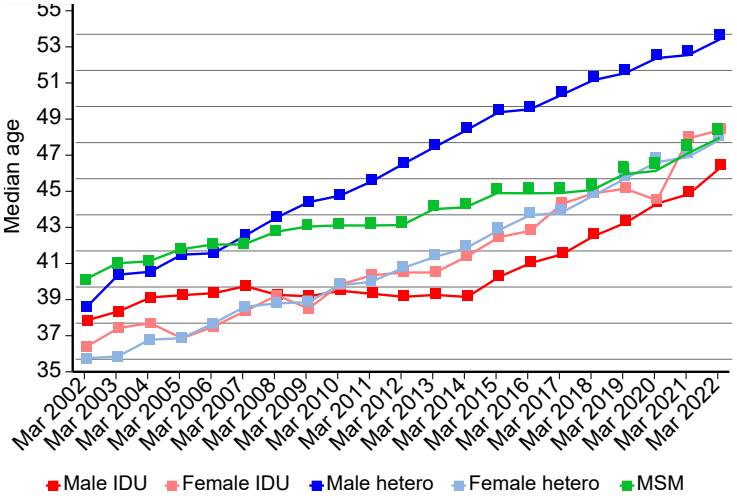




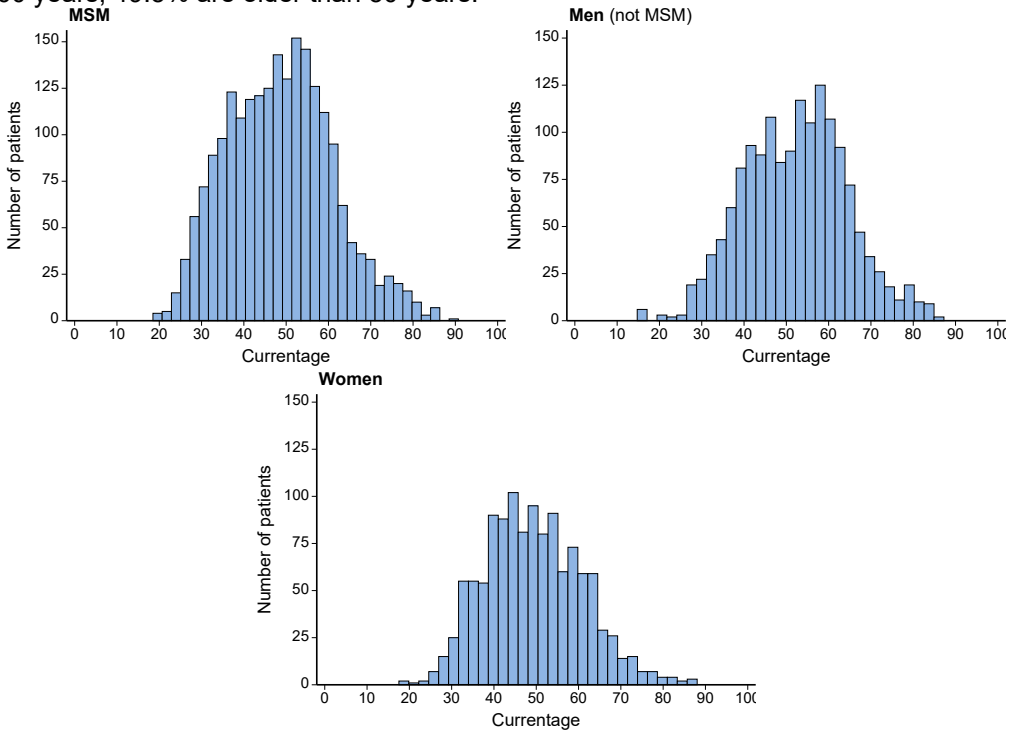

MSM
Age at time of HIV diagnosis
0
10
20
30
40
50
60
70
80
90
100
1985
1987
1989
1991
1993
1995
1997
1999
2001
2003
2005
2007
2009
2011
2013
2015
2017
2019
2021
Male heterosexual
Age at time of HIV diagnosis
Female heterosexual
Age at time of HIV diagnosis

5.3.2 Age of patients currently in care

Overall, median age increased from 39.4 in March 2002 to 49.6 in March 2022. In MSM, median age increased from 40.7 in March 2002 to 48.5 in March 2022, in men (not MSM) from 39.5 to 52.6 and in women from 36.7 to 48.6.



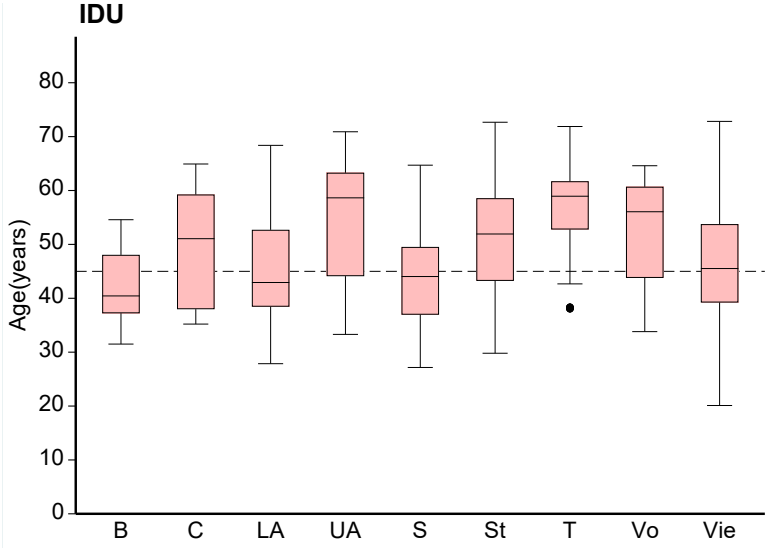
Median and average age are 49.8 and 49.9 years, respectively. 20.4% are older than 60 years, 49.5% are older than 50 years.



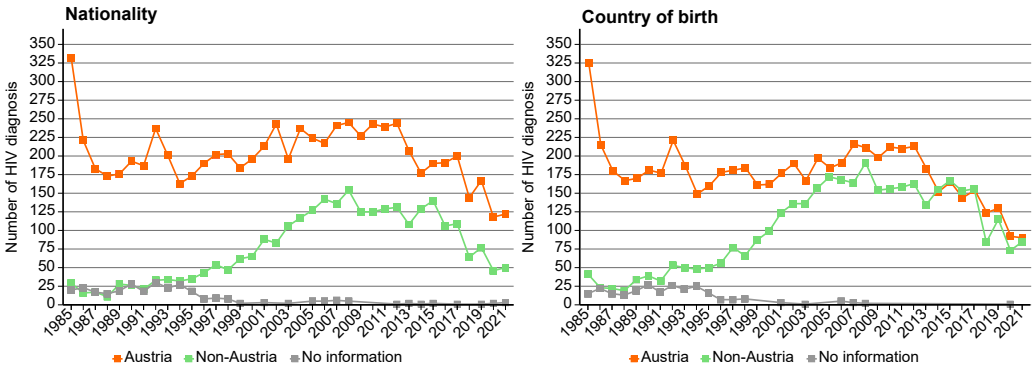
Age across the federal states: follow-up in the last 12 months

Federal state	Median Age years	≥50 years	≥60 years	≥75 years
Burgenland	49.8	48.8	20.7	2.4
Carinthia	49.9	49.4	19.9	1.6
Lower Austria	51.9	54.7	23.6	4.7
Upper Austria	49.7	49.2	23.4	2.6
Salzburg	49.4	47.4	15.4	1.9
Styria	48.4	45.5	16.4	1.5
Tyrol	52.2	56.0	23.7	3.3
Vorarlberg	50.4	52.0	23.3	4.9
Vienna	49.1	47.4	19.0	2.6
Total	**49.8**	**49.5**	**20.4**	**2.8**

Federal states: Patients with a follow-up in the last 12 months – injecting drug use



5.4 Nationality and country of birth

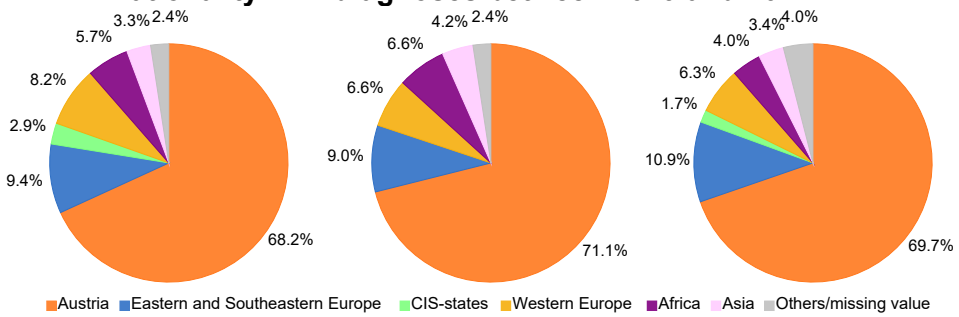


5.4.1 Overview

	BMG	AHIVCOS								
Year	Total	Austria		Low prevalence countries		High prevalence countries		Missing value		Total
1998	313	203	78.68%	29	11.24%	18	6.98%	8	3.10%	258
1999	339	184	74.19%	42	16.94%	20	8.06%	2	0.81%	248
2000	428	196	75.10%	33	12.64%	32	12.26%	0	0.00%	261
2001	402	213	70.07%	48	15.79%	40	13.16%	3	0.99%	304
2002	442	243	74.54%	48	14.72%	35	10.74%	0	0.00%	326
2003	423	196	64.47%	55	18.09%	51	16.78%	2	0.66%	304
2004	470	237	66.95%	58	16.38%	59	16.67%	0	0.00%	354
2005	453	224	62.92%	56	15.73%	71	19.94%	5	1.40%	356
2006	435	217	59.62%	80	21.98%	62	17.03%	5	1.37%	364
2007	515	241	62.92%	72	18.80%	64	16.71%	6	1.57%	383
2008	505	245	60.64%	101	25.00%	53	13.12%	5	1.24%	404
2009	507	227	64.49%	77	21.88%	48	13.64%	0	0.00%	352
2010	487	243	66.03%	94	25.54%	31	8.42%	0	0.00%	368
2011	525	239	64.95%	99	26.90%	30	8.15%	0	0.00%	368
2012	523	244	64.89%	95	25.27%	36	9.57%	1	0.27%	376
2013	481	207	65.30%	86	27.13%	22	6.94%	2	0.63%	317
2014	403	177	57.65%	94	30.62%	35	11.40%	1	0.33%	307
2015	428	190	57.23%	104	31.33%	36	10.84%	2	0.60%	332
2016	447	191	64.31%	79	26.60%	27	9.09%	0	0.00%	297
2017	510	200	64.52%	94	30.32%	15	4.84%	1	0.32%	310
2018	397*	144	69.23%	54	25.96%	10	4.81%	0	0.00%	208
2019	430*	167	68.16%	62	25.31%	15	6.12%	1	0.41%	245
2020	332*	118	71.08%	37	22.29%	9	5.42%	2	1.20%	166
2021	376*	122	69.71%	41	23.43%	9	5.14%	3	1.71%	175
2022	-	11	68.75%	5	31.25%	0	0.00%	0	0.00%	16

*Numbers who have been tested, in chronological order (2018 – 2021): 74, 94, 49 and 66.

5.4.2 Nationality: HIV diagnoses between 2019 and 2021

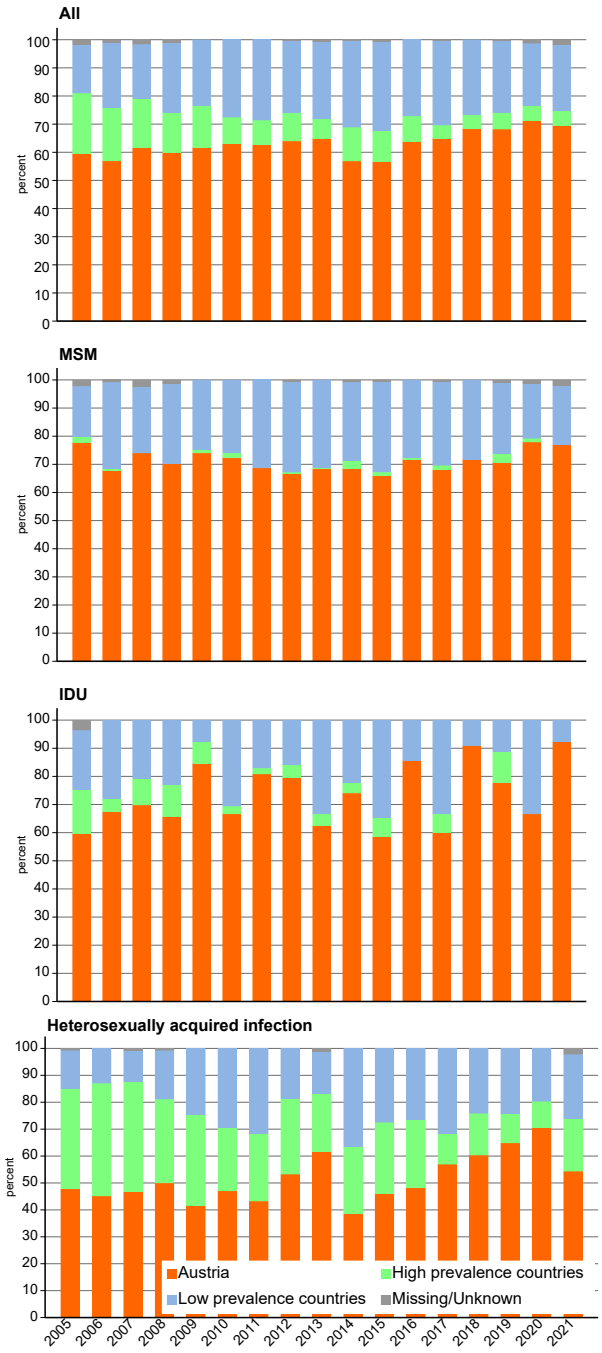


HIV diagnosis 2019 N=245	
Afghanistan	1
Austria	167
Azerbaijan	1
Bosnia and Herzegovina	3
Brazil	3
Bulgaria	4
Cameroon	2
Congo	1
Ecuador	1
Egypt	1
France	1
Germany	13
Ghana	1
Greece	1
Hungary	2
Iran	2
Italy	5
Kazakhstan	1
Libya	1
Lithuania	1
Mexico	1
Namibia	1
Nigeria	3
Philippines	1
Poland	1
Romania	4
Russian Federation	2
Senegal	1
Serbia	3
Slovakia	1
South Africa	1
Sudan	1
Syrian Arab Republic	1
Thailand	3
Turkey	4
Ukraine	2
Unknown	1
Uzbekistan	1
Zimbabwe	1

HIV diagnosis 2020 N=166	
Afghanistan	1
Africa	1
Algeria	1
Austria	118
Bosnia and Herzegovina	1
Botswana	1
Brazil	1
Bulgaria	1
Egypt	1
Ethiopia	1
Gambia	1
Georgia	1
Germany	5
Ghana	1
Guinea-Bissau	2
Hungary	2
India	1
Indonesia	1
Italy	1
Lebanon	1
Netherlands	1
Philippines	1
Poland	3
Portugal	1
Romania	2
Serbia	3
Sierra Leone	1
Somalia	1
Spain	2
Syrian Arab Republic	1
Thailand	1
Turkey	2
United Kingdom of Great Britain	1
Unknown	2
Venezuela	1

HIV diagnosis 2021 N=175	
Afghanistan	1
Armenia	1
Austria	122
Bosnia and Herzegovina	1
Brazil	1
Chile	1
China	1
Croatia	2
Egypt	1
Germany	4
Ghana	2
Haiti	1
Hungary	3
Italy	3
Kenya	1
Lithuania	1
Nigeria	1
Philippines	1
Poland	1
Portugal	3
Romania	5
Russian Federation	1
Saint Vincent and the Grenad	1
Serbia	2
Slovakia	2
Slovenia	1
Somalia	1
Switzerland	1
Syrian Arab Republic	1
Thailand	2
Turkey	1
Ukraine	1
Unknown	3
Zimbabwe	1

5.4.3 Nationality

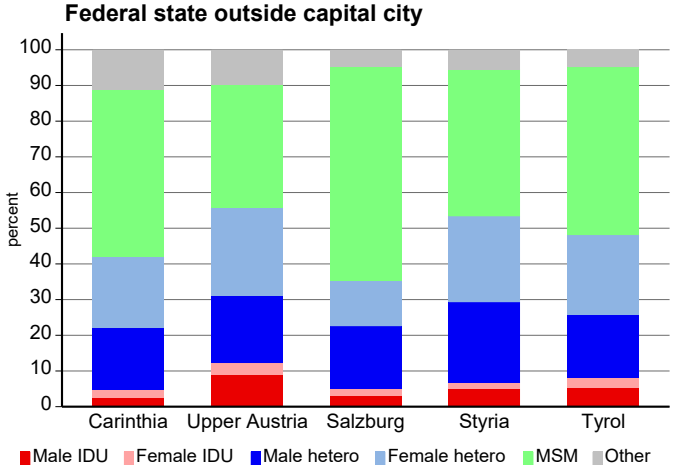


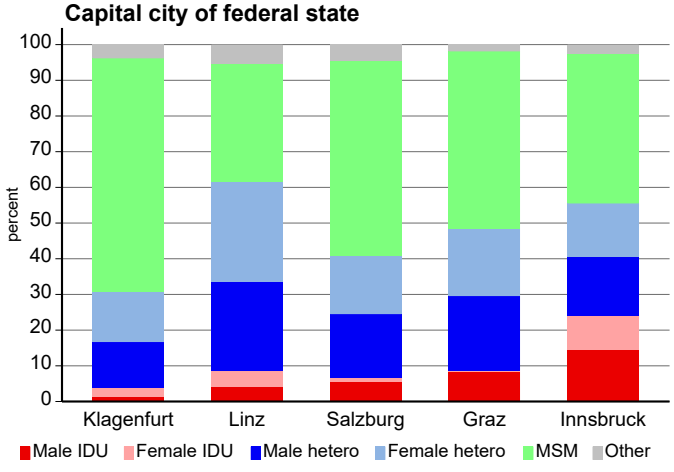
Low prevalence countries are countries with an HIV infection rate of adults <1%, high prevalence countries are countries with an HIV infection rate of adults ≥1%.

5.5 Residence

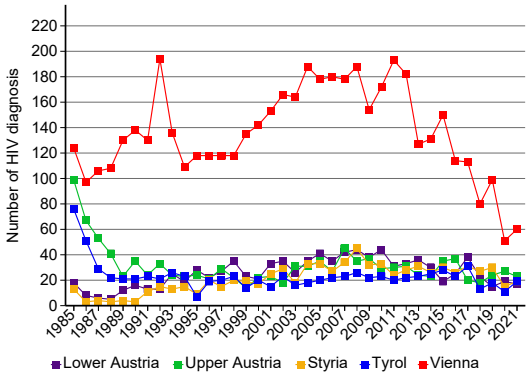
5.5.1 Population size of area of residence

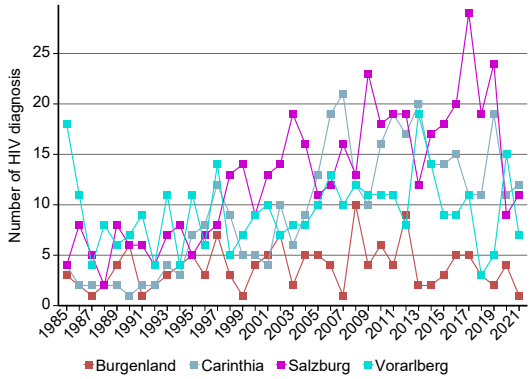
	Living with HIV/AIDS						Deceased					
	< 100 000		≥ 100 000		> 1 million		< 100 000		≥ 100 000		> 1 million	
	N (% women)		N (% women)		N (% women)		N (% women)		N (% women)		N (% women)	
B	108	30.6%	1		-		20	20.0%	-		-	
C	235	24.3%	78	16.7%	-		21	23.8%	8	12.5%	-	
LA	762	26.0%	-		-		161	18.0%	-		-	
UA	474	29.5%	304	33.6%	-		179	29.6%	192	31.8%	-	
S	195	15.4%	196	17.9%	-		28	17.9%	42	11.9%	-	
St	403	27.0%	264	20.1%	-		59	25.4%	37	18.9%	-	
T	393	25.4%	200	25.5%	-		114	21.9%	132	25.8%	-	
Vo	244	25.4%	-		-		65	27.7%	-		-	
Vie	-		-		3582	21.4%	-		-		1466	20.3%





5.5.2 Residence: Federal states

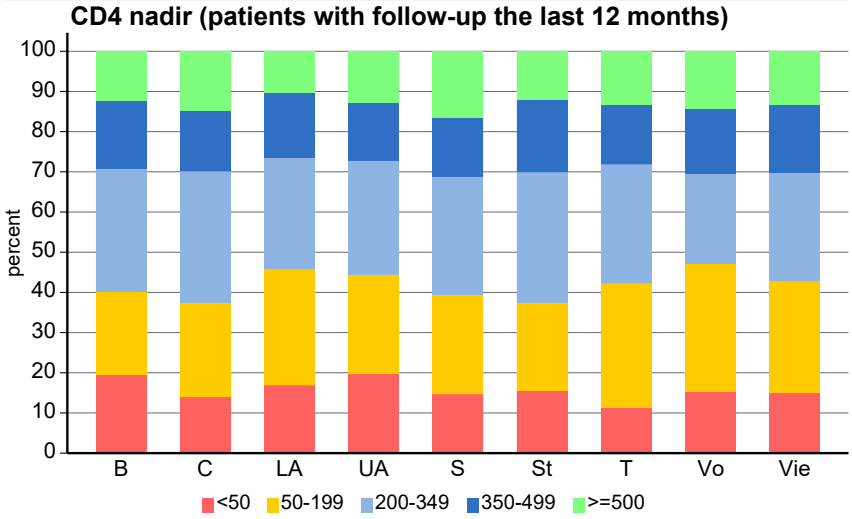




5.6 Stage of HIV disease

5.6.1 Lowest ever measured CD4 cell count

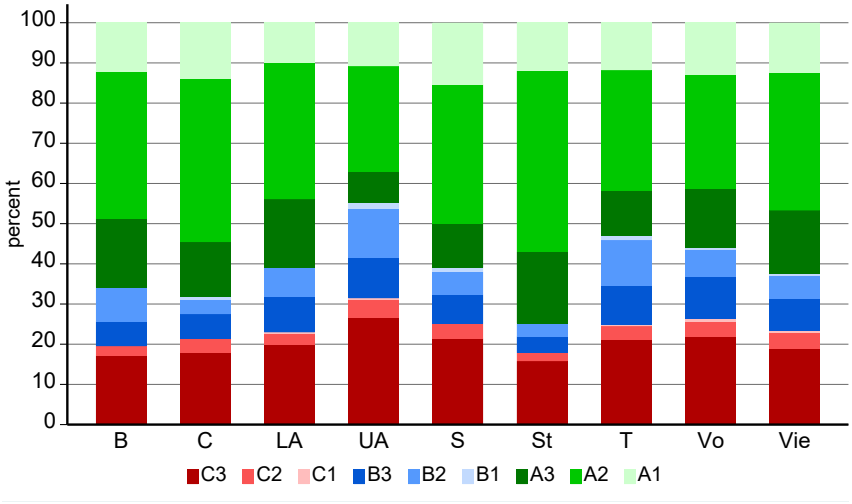
The median of the lowest CD4 cell count ever measured („CD4 nadir“) in the patients with follow-up in the last 12 months is 237/µl.



5.6.2 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**

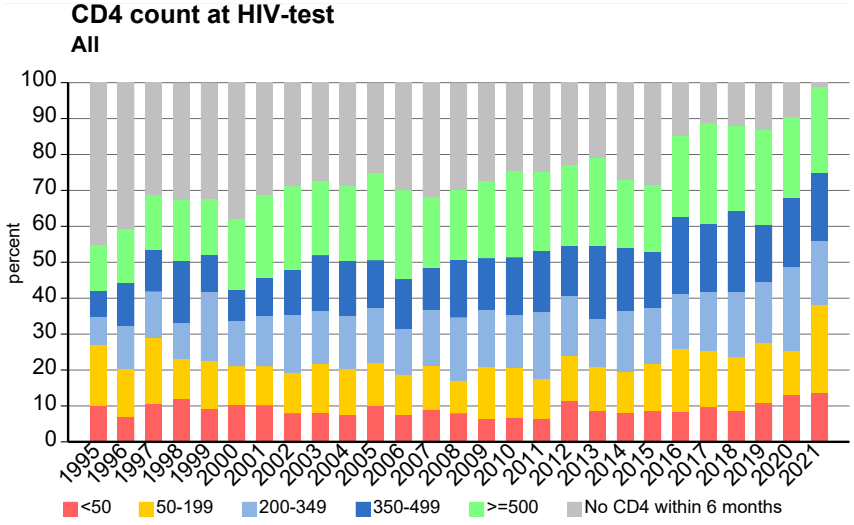


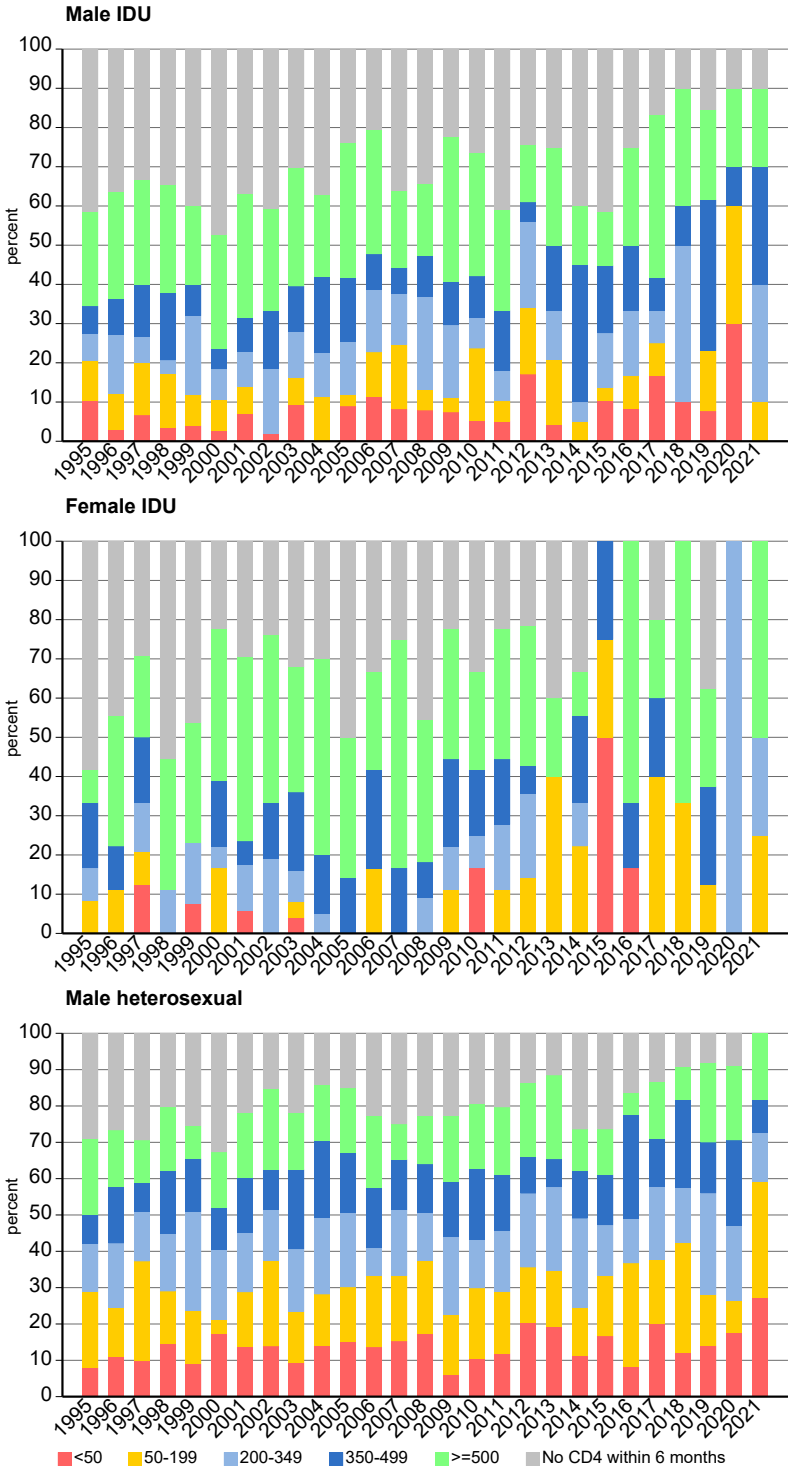
6 Diagnosis of HIV and presentation to an HIV centre

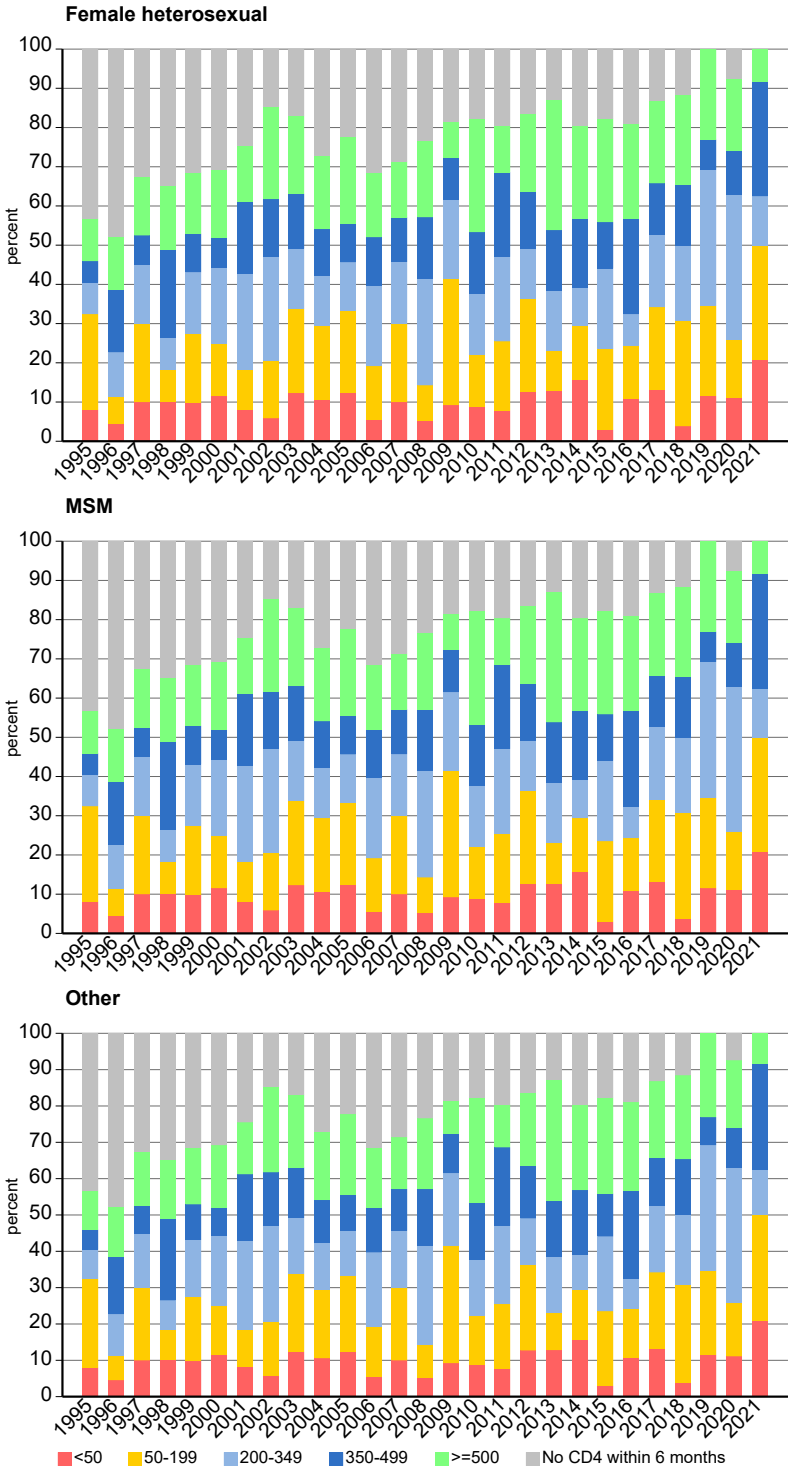
6.1 Presentation to an HIV centre

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, 439 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	19.5	111.1	59	5.3	62.2	250.0	50.0	529.0
1995	216	2.6	96.7	39	4.2	101.4	238.5	86.0	473.0
2000	254	1.0	128.0	56	2.3	92.0	360.5	139.0	563.0
2005	350	0.7	76.1	81	1.1	34.5	349.0	147.0	535.0
2006	354	0.7	64.7	56	1.1	30.6	370.5	193.0	580.0
2007	372	0.7	73.5	72	1.8	52.9	326.0	153.0	546.5
2008	395	0.8	67.6	49	1.7	88.3	395.0	227.0	568.0
2009	342	0.6	64.2	36	0.8	38.1	343.5	197.0	550.0
2010	357	0.5	58.8	50	0.6	55.5	395.0	199.0	626.0
2011	357	0.5	49.7	55	1.9	38.8	380.0	221.0	574.0
2012	371	0.5	39.5	55	0.9	47.0	361.0	154.0	580.0
2013	306	0.5	33.1	28	1.5	40.9	399.5	206.0	621.0
2014	297	0.6	28.6	29	2.0	48.0	380.0	200.0	564.0
2015	317	0.5	27.8	33	1.6	38.5	374.0	179.0	564.0
2016	288	0.4	7.7	17	0.7	7.7	367.0	157.5	555.0
2017	302	0.4	5.3	17	1.2	9.4	385.0	184.0	572.0
2018	204	0.3	6.1	13	0.5	5.9	362.5	198.0	556.0
2019	239	0.4	7.5	20	1.2	8.4	367.0	145.0	579.0
2020	163	0.4	4.6	12	0.6	4.0	338.0	179.0	539.0
2021	173	0.3	1.4	13	0.4	1.9	265.0	105.0	486.0
2022	16	0.2	0.7	1	0.1	0.1	110.0	43.0	398.0




Male IDU
Female IDU
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
<50
50-199
200-349
350-499
>=500
No CD4 within 6 months


Female heterosexual
MSM
Other
percent
0
10
20
30
40
50
60
70
80
90
100
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
<50
50-199
200-349
350-499
>=500
No CD4 within 6 months

6.2 Patients diagnosed since 2001

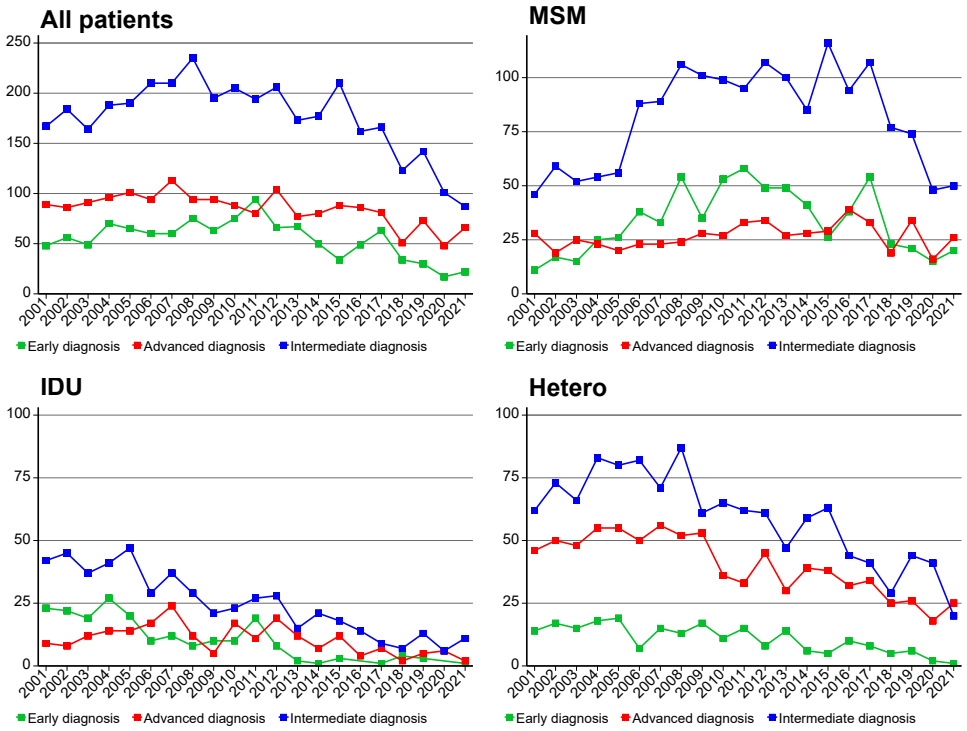
6.2.1 Frequency of early and late diagnoses

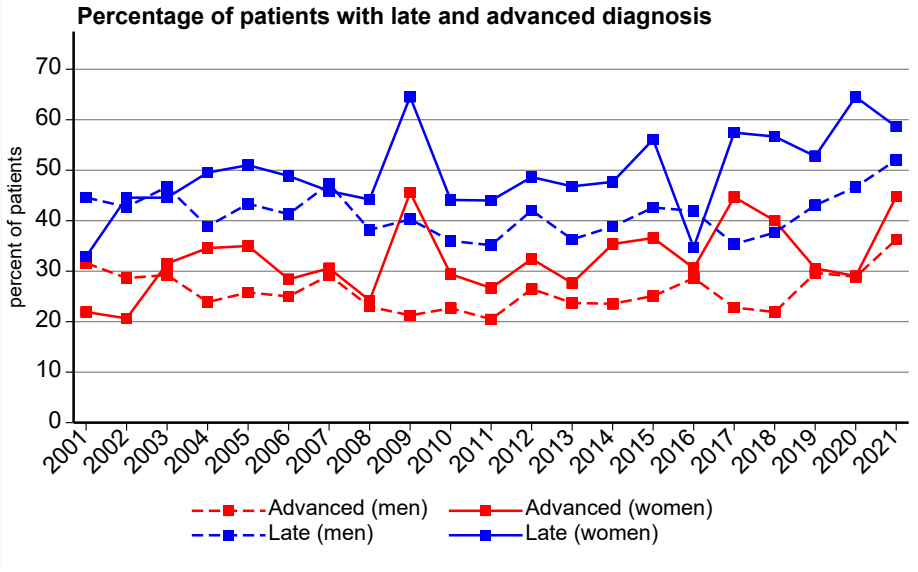
“Early” diagnosis or **„recent“ infection** is defined as: acute HIV infection (westernblot pattern or antigen/HIV RNA combined with clinical presentation) or documented seroconversion with negative HIV test not more than 3 years before the first positive test.

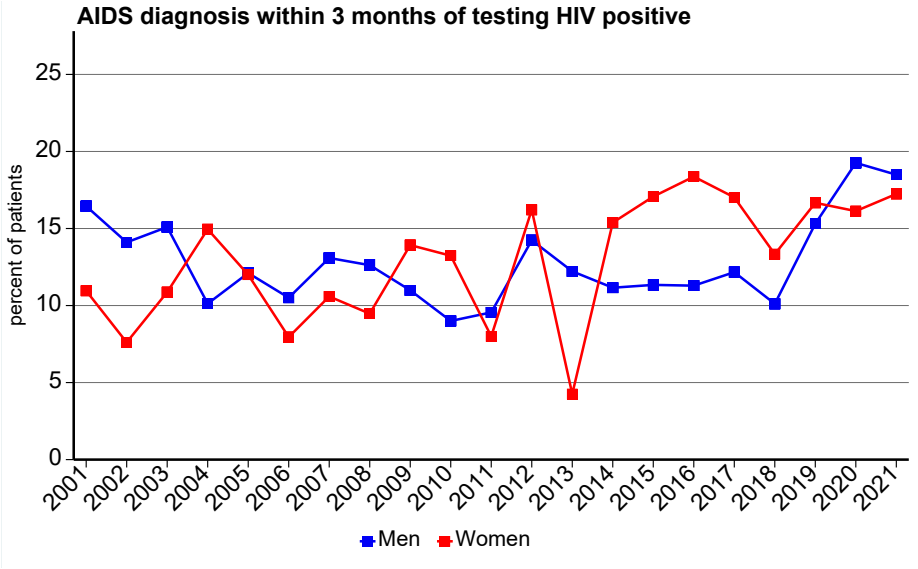
“Late” diagnosis is defined as: CD4 cell count below 350 at time of HIV diagnosis and/or AIDS within 3 months of HIV diagnosis

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

“Intermediate” diagnosis: CD4 cell count > 200, however not early diagnosed




Percentage of patients with late and advanced diagnosis
percent of patients
70
60
50
40
30
20
10
0
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
Advanced (men)
Advanced (women)
Late (men)
Late (women)


AIDS diagnosis within 3 months of testing HIV positive
percent of patients
25
20
15
10
5
0
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
Men
Women

6.2.2 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	1147	6632	17.29%	**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	466	2302	20.24%	1.88	[1.49,2.37]	0.000	1.84	[1.43,2.37]	0.000
30-50 years	581	3491	16.64%	1.48	[1.18,1.85]	0.001	1.39	[1.10,1.77]	0.006
≥ 50	100	839	11.92%	1.00	[1.00,1.00]	.	1.00	[1.00,1.00]	.
HIV transmission category									
Male IDU	137	712	19.24%	0.77	[0.63,0.95]	0.013	0.77	[0.62,0.95]	0.016
Female IDU	66	231	28.57%	1.29	[0.96,1.74]	0.089	1.13	[0.82,1.54]	0.458
Male heterosexual	115	1230	9.35%	0.33	[0.27,0.41]	0.000	0.39	[0.31,0.48]	0.000
Female heterosexual	111	1086	10.22%	0.37	[0.30,0.46]	0.000	0.43	[0.34,0.54]	0.000
Other	17	403	4.22%	0.14	[0.09,0.23]	0.000	0.17	[0.10,0.27]	0.000
MSM	701	2970	23.60%	1.00	[1.00,1.00]	.	1.00	[1.00,1.00]	.
Federal state									
Carinthia	29	284	10.21%	0.65	[0.44,0.97]	0.036			
Upper Austria	114	606	18.81%	1.33	[1.06,1.67]	0.013			
Salzburg	90	355	25.35%	1.96	[1.51,2.53]	0.000			
Styria	93	596	15.60%	1.06	[0.83,1.36]	0.615			
Tyrol	148	443	33.41%	2.89	[2.31,3.60]	0.000			
Other federal states	184	960	19.17%	1.36	[1.13,1.65]	0.001			
Missing	0	7	0.00%	1.00	[1.00,1.00]	.			
Foreign countries	41	354	11.58%	0.75	[0.54,1.06]	0.104			
Vienna	448	3027	14.80%	1.00	[1.00,1.00]	.			
Population size of area of residence									
Missing value	4	86	4.65%	0.28	[0.10,0.78]	0.014	0.44	[0.16,1.22]	0.113
< 100 000	518	2599	19.93%	1.44	[1.26,1.66]	0.000	1.76	[1.52,2.04]	0.000
≥ 100 000	175	885	19.77%	1.43	[1.18,1.74]	0.000	1.79	[1.46,2.20]	0.000
> 1 million	450	3062	14.70%	1.00	[1.00,1.00]	.	1.00	[1.00,1.00]	.
Nationality									
Missing value	4	39	10.26%	0.43	[0.15,1.21]	0.108	0.45	[0.16,1.30]	0.141
Low prevalence countries	197	1539	12.80%	0.55	[0.47,0.65]	0.000	0.55	[0.46,0.65]	0.000
High prevalence countries	40	758	5.28%	0.21	[0.15,0.29]	0.000	0.31	[0.22,0.43]	0.000
Austria	906	4296	21.09%	1.00	[1.00,1.00]	.	1.00	[1.00,1.00]	.
Calendar period of HIV test									
2005-2008	260	1507	17.25%	1.00	[0.82,1.21]	0.966	0.97	[0.79,1.19]	0.753
2009-2012	298	1464	20.36%	1.22	[1.01,1.48]	0.042	1.09	[0.89,1.34]	0.384
2013-2016	200	1253	15.96%	0.91	[0.74,1.12]	0.360	0.79	[0.64,0.99]	0.042
≥ 2017	166	1120	14.82%	0.83	[0.67,1.03]	0.098	0.69	[0.55,0.88]	0.002
2001-2004	223	1288	17.31%	1.00	[1.00,1.00]	.	1.00	[1.00,1.00]	.

6.2.3 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

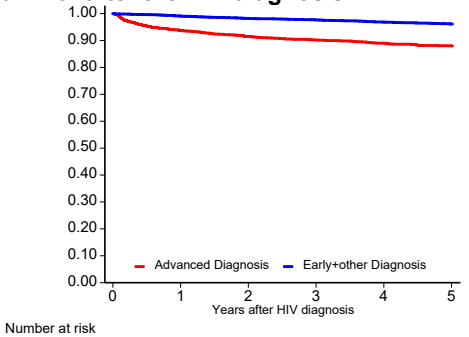
All centres	2827	6632	42.63%	**Univariable logistic Regression**			**Multivariable logistic Regression**		
	Frequencies		**%**	**OR**	**[95% CI]**	**p value**	**OR**	**[95% CI]**	**p value**
Demographic characteristics									
Age at time of HIV diagnosis									
< 30 years	735	2302	31.93%	0.33	[0.28,0.39]	0.000	0.34	[0.29,0.41]	0.000
30-50 years	1598	3491	45.77%	0.59	[0.51,0.69]	0.000	0.62	[0.53,0.73]	0.000
≥ 50	494	839	58.88%	1.00	[1.00,1.00]	.	1.00	[1.00,1.00]	.
HIV transmission category									
Male IDU	289	712	40.59%	1.35	[1.14,1.59]	0.000	1.49	[1.25,1.78]	0.000
Female IDU	60	231	25.97%	0.69	[0.51,0.94]	0.018	0.88	[0.65,1.21]	0.432
Male heterosexual	695	1230	56.50%	2.56	[2.24,2.94]	0.000	2.07	[1.79,2.39]	0.000
Female heterosexual	564	1086	51.93%	2.13	[1.85,2.46]	0.000	1.95	[1.67,2.28]	0.000
Other	220	403	54.59%	2.37	[1.92,2.93]	0.000	2.08	[1.67,2.59]	0.000
MSM	999	2970	33.64%	1.00	[1.00,1.00]	.	1.00	[1.00,1.00]	.
Federal state									
Carinthia	135	284	47.54%	1.29	[1.01,1.64]	0.042			
Upper Austria	283	606	46.70%	1.25	[1.05,1.48]	0.014			
Salzburg	150	355	42.25%	1.04	[0.83,1.30]	0.729			
Styria	269	596	45.13%	1.17	[0.98,1.40]	0.083			
Tyrol	170	443	38.37%	0.89	[0.72,1.09]	0.243			
Other federal states	432	960	45.00%	1.16	[1.00,1.35]	0.043			
Missing	1	7	14.29%	0.24	[0.03,1.97]	0.183			
Foreign countries	137	354	38.70%	0.90	[0.72,1.12]	0.348			
Vienna	1250	3027	41.30%	1.00	[1.00,1.00]	.			
Population size of area of residence									
Missing value	30	86	34.88%	0.76	[0.49,1.19]	0.236	0.64	[0.40,1.02]	0.058
< 100 000	1167	2599	44.90%	1.16	[1.04,1.29]	0.006	1.01	[0.90,1.13]	0.852
≥ 100 000	366	885	41.36%	1.00	[0.86,1.17]	0.968	0.88	[0.75,1.04]	0.126
> 1 million	1264	3062	41.28%	1.00	[1.00,1.00]	.	1.00	[1.00,1.00]	.
Nationality									
Missing/Unknown	10	39	25.64%	0.50	[0.24,1.03]	0.061	0.50	[0.23,1.05]	0.066
Low prevalence countries	631	1539	41.00%	1.01	[0.90,1.14]	0.868	1.10	[0.97,1.25]	0.126
High prevalence countries	435	758	57.39%	1.96	[1.67,2.29]	0.000	1.65	[1.38,1.96]	0.000
Austria	1751	4296	40.76%	1.00	[1.00,1.00]	.	1.00	[1.00,1.00]	.
Calendar period of HIV test									
2005-2008	659	1507	43.73%	1.02	[0.88,1.18]	0.797	1.03	[0.88,1.21]	0.703
2009-2012	598	1464	40.85%	0.91	[0.78,1.05]	0.203	0.96	[0.81,1.12]	0.577
2013-2016	513	1253	40.94%	0.91	[0.78,1.07]	0.240	0.96	[0.81,1.13]	0.592
≥ 2017	500	1120	44.64%	1.06	[0.90,1.24]	0.491	1.07	[0.90,1.28]	0.421
2001-2004	557	1288	43.25%	1.00	[1.00,1.00]	.	1.00	[1.00,1.00]	.

6.2.4 Factors associated with mortality in patients diagnosed since 2001

Date of censoring: last contact with the HIV centre (25 missing)

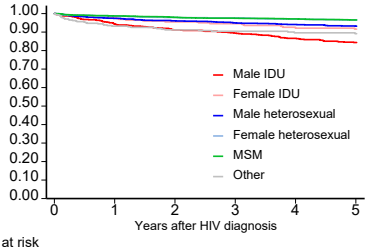
All centres	689	6632	10.39%	**Univariable Cox Regression**			**Multivariable Cox Regression**		
	Frequencies		**%**	**HR**	**[95% CI]**	**p value**	**HR**	**[95% CI]**	**p value**
Demographic characteristics									
Age at time of HIV diagnosis									
< 30 years	175	2302	7.60%	0.26	[0.21,0.31]	0.000	0.18	[0.14,0.22]	0.000
30-50 years	317	3491	9.08%	0.32	[0.27,0.38]	0.000	0.27	[0.23,0.33]	0.000
≥ 50	197	839	23.48%	1.00	[1.00,1.00]	.	1.00	[1.00,1.00]	.
HIV transmission category									
Male IDU	195	712	27.39%	3.99	[3.25,4.90]	0.000	4.54	[3.65,5.64]	0.000
Female IDU	60	231	25.97%	3.34	[2.48,4.48]	0.000	4.12	[3.01,5.63]	0.000
Male heterosexual	147	1230	11.95%	1.81	[1.45,2.25]	0.000	1.22	[0.97,1.53]	0.092
Female heterosexual	63	1086	5.80%	0.80	[0.60,1.06]	0.124	0.80	[0.59,1.08]	0.141
Other	52	403	12.90%	2.66	[1.95,3.62]	0.000	1.94	[1.41,2.68]	0.000
MSM	172	2970	5.79%	1.00	[1.00,1.00]	.	1.00	[1.00,1.00]	.
Population size of area of residence									
Missing value	6	86	6.98%	1.02	[0.46,2.29]	0.960	1.30	[0.56,3.02]	0.534
< 100 000	211	2599	8.12%	0.61	[0.51,0.72]	0.000	0.66	[0.55,0.78]	0.000
≥ 100 000	71	885	8.02%	0.59	[0.46,0.76]	0.000	0.75	[0.58,0.98]	0.032
> 1 million	401	3062	13.10%	1.00	[1.00,1.00]	.	1.00	[1.00,1.00]	.
Nationality									
Missing/Unknown	4	39	10.26%	0.95	[0.36,2.54]	0.919	1.14	[0.41,3.16]	0.804
Low prevalence countries	85	1539	5.52%	0.52	[0.42,0.66]	0.000	0.68	[0.54,0.86]	0.001
High prevalence countries	41	758	5.41%	0.43	[0.31,0.59]	0.000	0.72	[0.51,1.01]	0.055
Austria	559	4296	13.01%	1.00	[1.00,1.00]	.	1.00	[1.00,1.00]	.
Stage of disease									
Advanced diagnosis									
Yes	296	1790	16.54%	2.18	[1.87,2.53]	0.000	2.01	[1.72,2.35]	0.000
No	393	4842	8.12%	1.00	[1.00,1.00]	.	1.00	[1.00,1.00]	.
Calendar period of HIV test									
2005-2008	195	1507	12.94%	0.72	[0.60,0.87]	0.001	0.82	[0.67,0.99]	0.037
2009-2012	128	1464	8.74%	0.64	[0.51,0.80]	0.000	0.72	[0.58,0.90]	0.004
2013-2016	62	1253	4.95%	0.53	[0.40,0.70]	0.000	0.60	[0.45,0.81]	0.001
≥ 2017	28	1120	2.50%	0.49	[0.32,0.73]	0.000	0.53	[0.35,0.80]	0.002
2001-2004	276	1288	21.43%	1.00	[1.00,1.00]	.	1.00	[1.00,1.00]	.

Survival after the HIV diagnosis



Number at risk

Advanced	1789	1483	1364	1253	1165	1070
Early	4825	4322	4013	3728	3451	3151



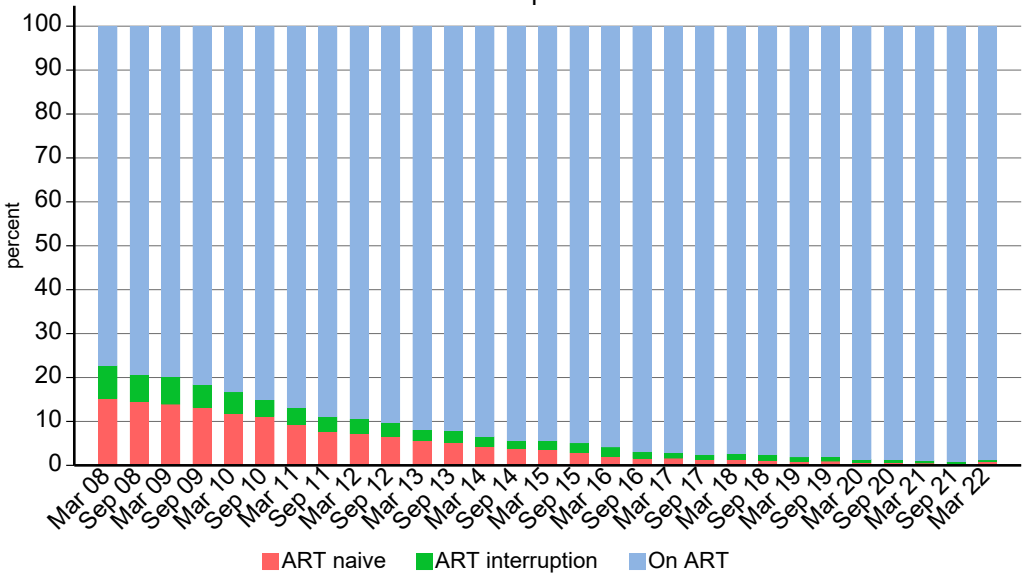
Number at risk

Male IDU	709	630	584	549	510	478
Female IDU	231	216	205	197	187	180
Male heterosexual	1229	1065	983	904	853	784
Female heterosexual	1085	958	909	862	817	779
MSM	2963	2642	2435	2233	2037	1807
Other	397	294	261	236	212	193

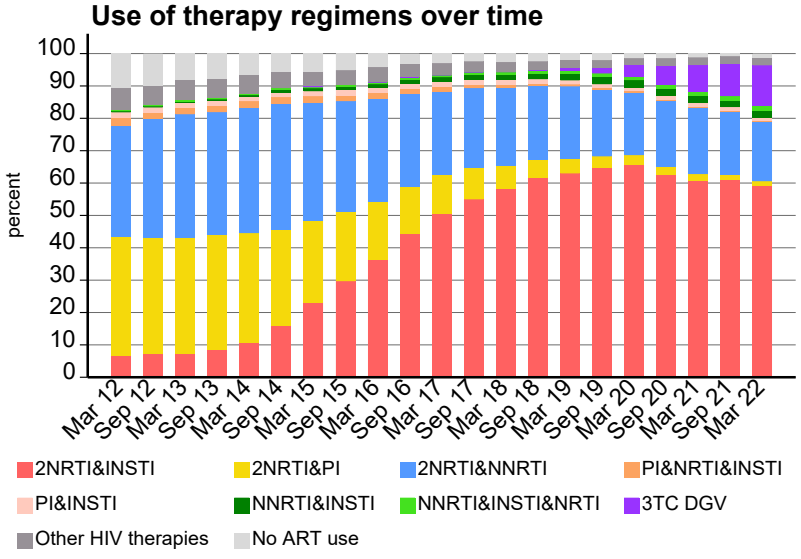
7 Antiretroviral therapy (ART)

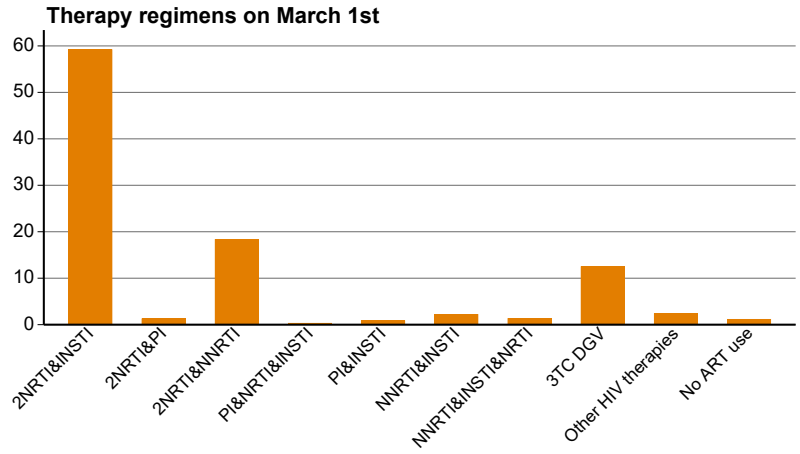
7.1 Patients currently in care regarding treatment status

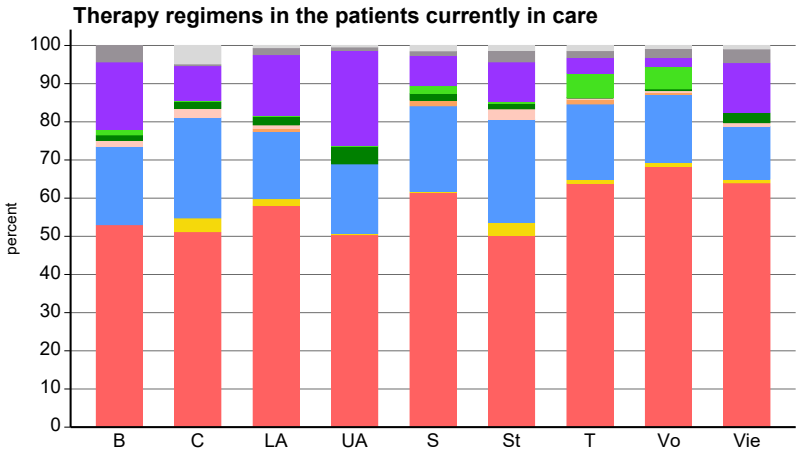
On March 1st, 2022 4412 (98.8%) patients were on antiretroviral therapy in the 9 HIV treatment centres. Of the 54 patients not on treatment on March 1st, 2022, 14 had received antiretroviral treatment at an earlier point in time.

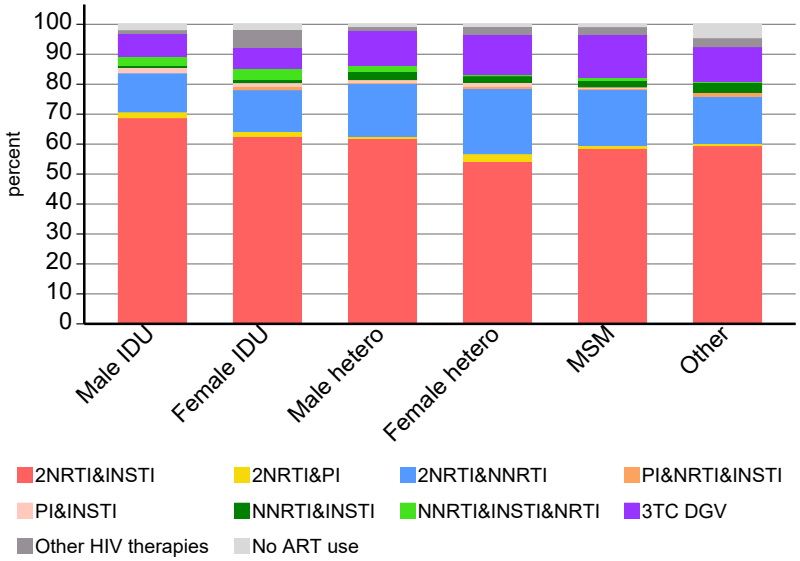


7.2 Regimens of antiretroviral therapy



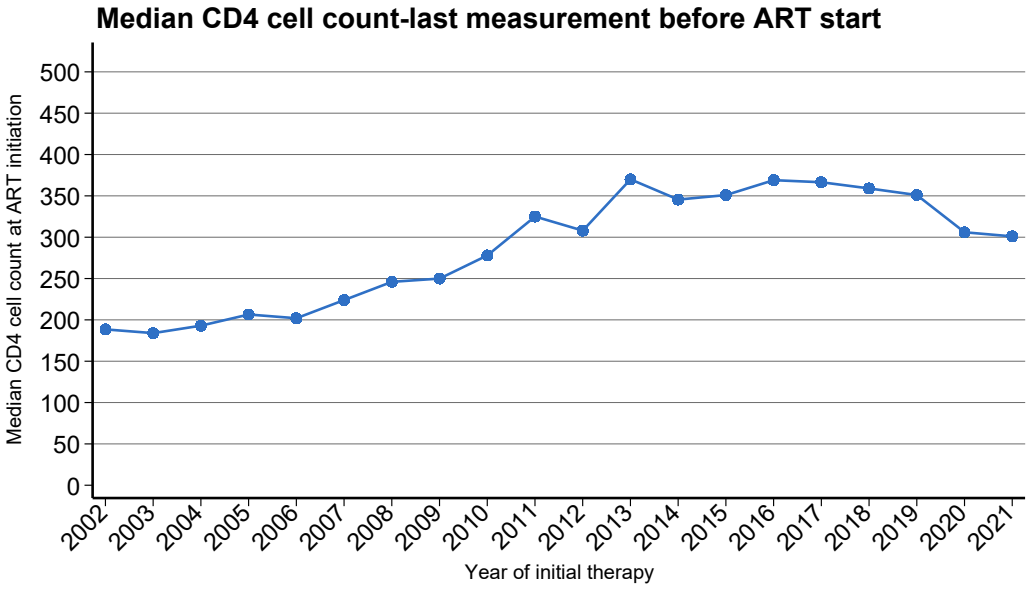

Therapy regimens on March 1st
60
50
40
30
20
10
0
2NRTI&INSTI
2NRTI&PI
2NRTI&NNRTI
PI&NRTI&INSTI
PI&INSTI
NNRTI&INSTI
NNRTI&INSTI&NRTI
3TC DGV
Other HIV therapies
No ART use


Therapy regimens in the patients currently in care
percent
100
90
80
70
60
50
40
30
20
10
0
B
C
LA
UA
S
St
T
Vo
Vie

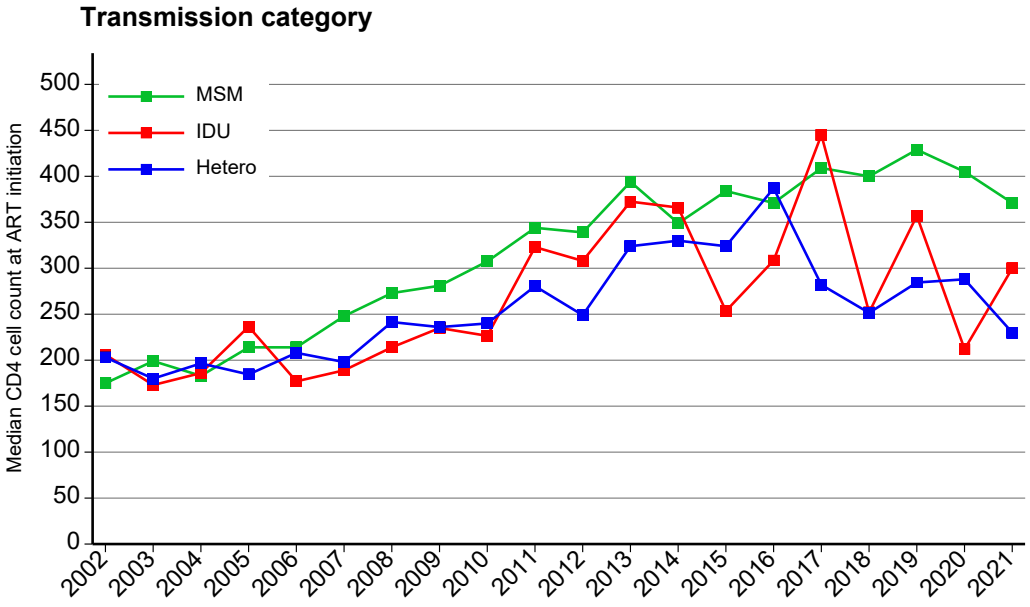

percent
100
90
80
70
60
50
40
30
20
10
0
Male IDU
Female IDU
Male hetero
Female hetero
MSM
Other
2NRTI&INSTI
2NRTI&PI
2NRTI&NNRTI
PI&NRTI&INSTI
PI&INSTI
NNRTI&INSTI
NNRTI&INSTI&NRTI
3TC DGV
Other HIV therapies
No ART use

7.3 CD4 cell counts at initiation of ART

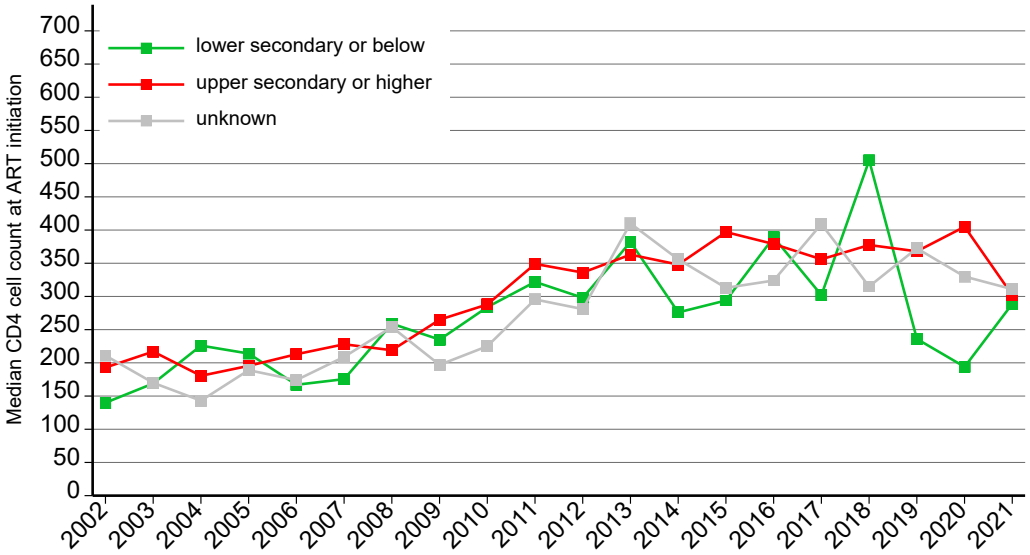
7.3.1 CD4 cell counts at initiation of ART



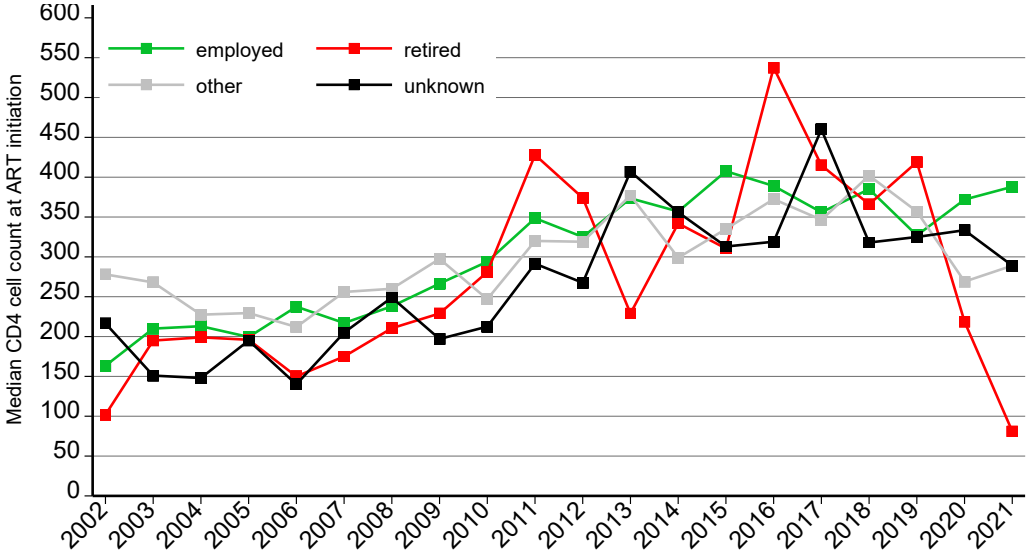
7.3.2 Median CD4 count at ART initiation



Level of education

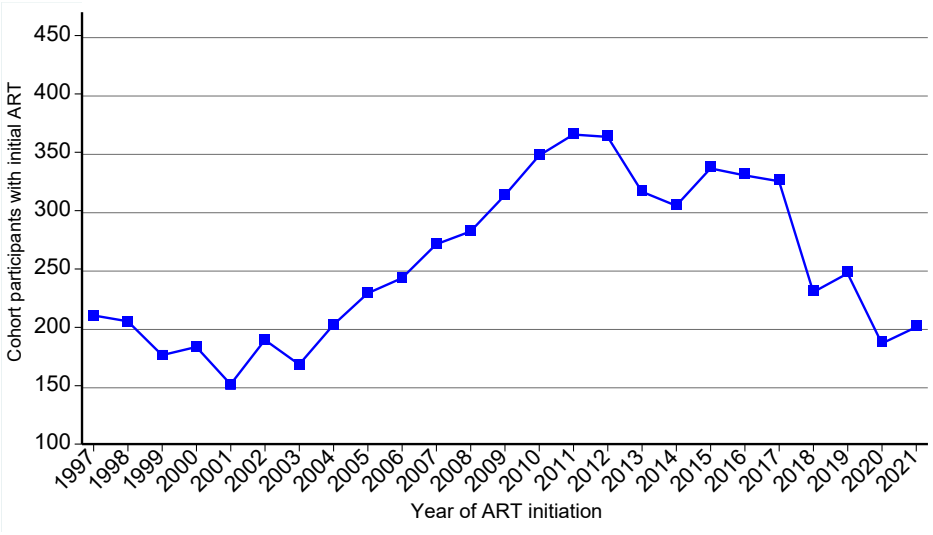


Status of employment



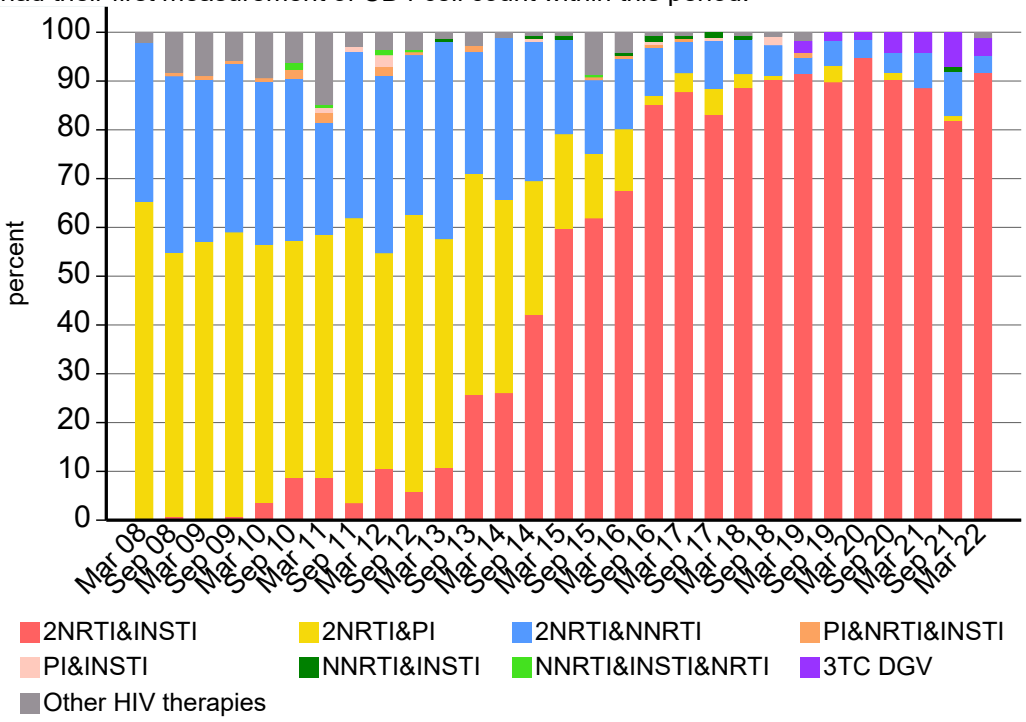
7.4 Initial therapy

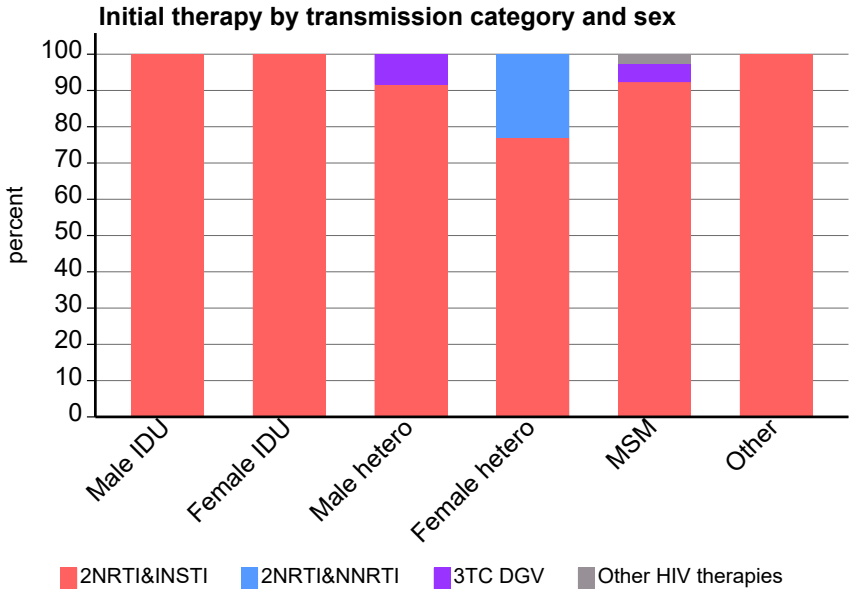
7.4.1 Number of persons who started ART in the respective year



7.4.2 Regimens of the initial therapy

After September 1st, 2021, 84 patients started antiretroviral therapy. 79 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
3TC DGV
Other HIV therapies

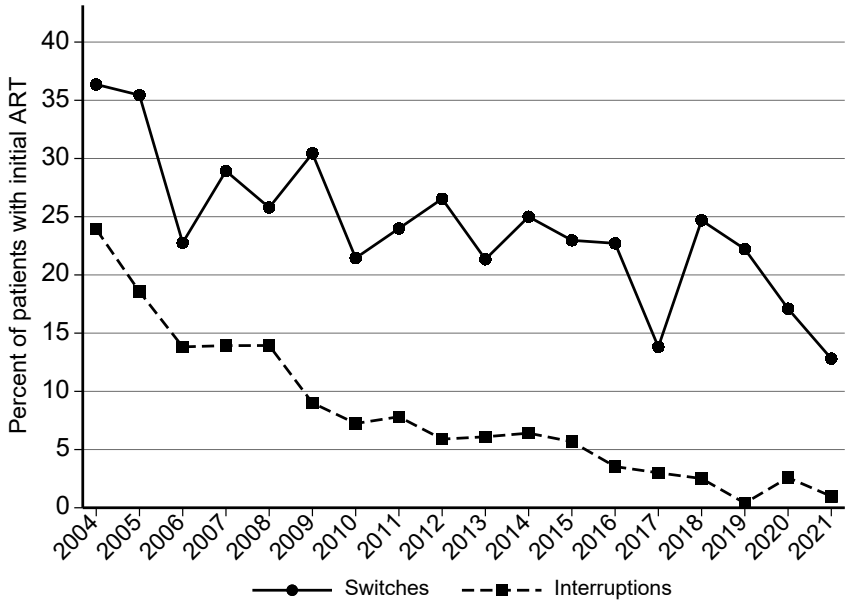
7.5 ART switches and interruptions

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

7.5.1.1 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	35.4	18.6
2006	22.8	13.8
2007	28.9	13.9
2008	25.8	13.9
2009	30.4	9.0
2010	21.4	7.2
2011	24.0	7.8
2012	26.5	5.9
2013	21.3	6.1
2014	25.0	6.4
2015	23.0	5.7
2016	22.7	3.5
2017	13.8	3.0
2018	24.7	2.5
2019	22.2	0.4
2020	17.1	2.6
2021	12.8	1.0

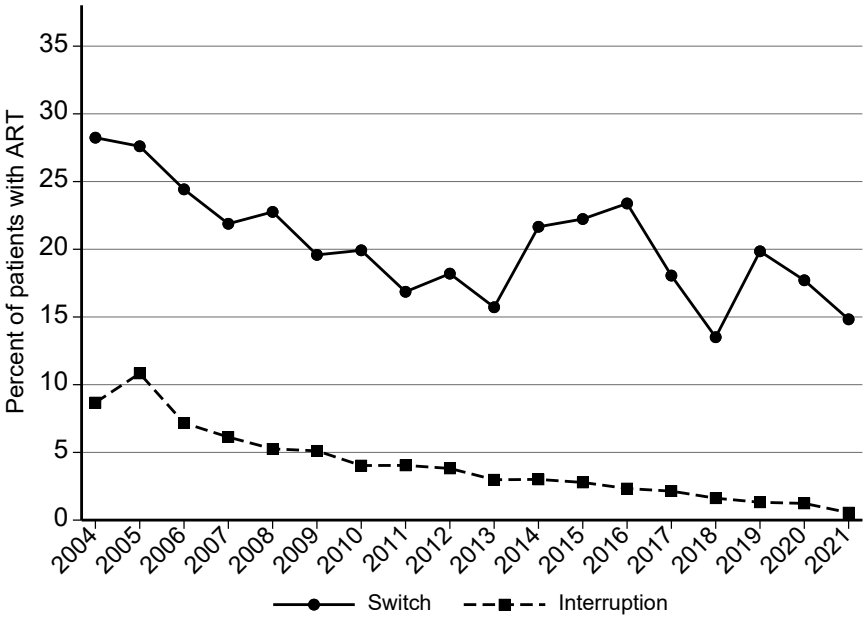


7.5.2 ART switches and interruptions per calendar year

7.5.2.1 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	28.2	8.7
2005	27.6	10.8
2006	24.4	7.2
2007	21.9	6.1
2008	22.8	5.3
2009	19.6	5.1
2010	19.9	4.0
2011	16.9	4.0
2012	18.2	3.8
2013	15.7	3.0
2014	21.7	3.0
2015	22.2	2.8
2016	23.4	2.3
2017	18.1	2.1
2018	13.5	1.6
2019	19.9	1.3
2020	17.7	1.2
2021	14.8	0.6



7.5.4 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		
	1264	5253	24.06%	OR	[95% CI]	p value	OR	[95% CI]	p value
HIV transmission category									
Male IDU	127	573	22.16%	1.01	[0.81,1.26]	0.931	0.90	[0.71,1.12]	0.342
Female IDU	42	205	20.49%	0.91	[0.64,1.30]	0.616	0.84	[0.59,1.21]	0.348
Male heterosexual	224	969	23.12%	1.07	[0.89,1.27]	0.481	0.88	[0.73,1.06]	0.173
Female heterosexual	282	868	32.49%	1.71	[1.44,2.03]	0.000	1.50	[1.26,1.79]	0.000
Other	67	265	25.28%	1.20	[0.89,1.61]	0.224	1.03	[0.76,1.39]	0.850
MSM	522	2373	22.00%	1.00	[1.00,1.00]	.	1.00	[1.00,1.00]	.
Age at baseline									
< 30 years	294	1306	22.51%	0.78	[0.64,0.95]	0.016	0.82	[0.66,1.01]	0.058
30-50 years	738	3090	23.88%	0.85	[0.71,1.00]	0.055	0.83	[0.69,0.99]	0.037
≥ 50	232	857	27.07%	1.00	[1.00,1.00]	.	1.00	[1.00,1.00]	.
AIDS at baseline									
Yes	280	793	35.31%	1.93	[1.64,2.27]	0.000			
No	984	4460	22.06%	1.00	[1.00,1.00]	.			
CD4 count at baseline									
< 50	200	589	33.96%	2.18	[1.77,2.68]	0.000	2.03	[1.63,2.51]	0.000
50-199	300	1035	28.99%	1.73	[1.45,2.07]	0.000	1.59	[1.32,1.92]	0.000
200-349	297	1371	21.66%	1.17	[0.99,1.40]	0.072	1.07	[0.89,1.28]	0.452
Missing	121	444	27.25%	1.59	[1.25,2.02]	0.000	1.69	[1.32,2.16]	0.000
≥ 350	346	1814	19.07%	1.00	[1.00,1.00]	.	1.00	[1.00,1.00]	.
HIV-RNA at baseline									
10.000-99.999	369	1843	20.02%	0.88	[0.72,1.07]	0.198			
≥ 100.000	517	1873	27.60%	1.34	[1.11,1.62]	0.002			
Missing	183	657	27.85%	1.36	[1.07,1.71]	0.010			
≤ 9.999	195	880	22.16%	1.00	[1.00,1.00]	.			
Nationality									
High prevalence countries	195	684	28.51%	1.31	[1.09,1.56]	0.004			
Low prevalence countries	1069	4569	23.40%	1.00	[1.00,1.00]	.			
Population size of area of residence									
Rural areas	509	2069	24.60%	1.13	[0.99,1.30]	0.073	1.14	[0.99,1.32]	0.068
Capital cities	203	713	28.47%	1.38	[1.15,1.67]	0.001	1.43	[1.18,1.73]	0.000
Vienna	552	2471	22.34%	1.00	[1.00,1.00]	.	1.00	[1.00,1.00]	.
Year of ART Initiation									
2004-2007	297	972	30.56%	1.87	[1.55,2.25]	0.000	1.75	[1.44,2.13]	0.000
2008-2011	338	1339	25.24%	1.43	[1.20,1.71]	0.000	1.47	[1.23,1.77]	0.000
2012-2015	332	1383	24.01%	1.34	[1.12,1.60]	0.001	1.39	[1.16,1.66]	0.000
2016-2021	297	1559	19.05%	1.00	[1.00,1.00]	.	1.00	[1.00,1.00]	.

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

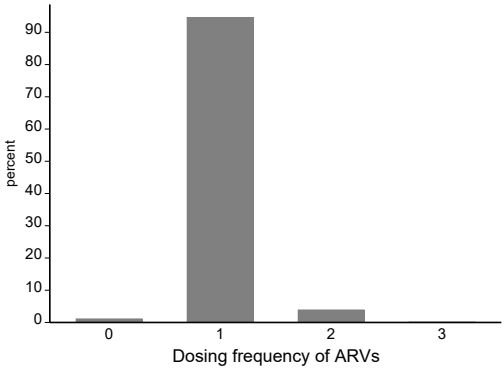
	TI	All		Univariable logistic regression			Multivariable logistic regression		
	410	5253	7.81%	OR	[95% CI]	p value	OR	[95% CI]	p value
HIV transmission category									
Male IDU	89	573	15.53%	4.95	[3.62,6.77]	0.000	3.53	[2.55,4.89]	0.000
Female IDU	51	205	24.88%	8.91	[6.07,13.08]	0.000	6.13	[4.08,9.20]	0.000
Male heterosexual	70	969	7.22%	2.10	[1.51,2.90]	0.000	1.69	[1.18,2.40]	0.004
Female heterosexual	103	868	11.87%	3.62	[2.69,4.89]	0.000	2.42	[1.73,3.40]	0.000
Other	12	265	4.53%	1.28	[0.69,2.37]	0.439	1.24	[0.66,2.35]	0.508
MSM	85	2373	3.58%	1.00	[1.00,1.00]	.	1.00	[1.00,1.00]	.
Age at baseline									
< 30 years	166	1306	12.71%	2.63	[1.87,3.70]	0.000	1.78	[1.22,2.58]	0.003
30-50 years	199	3090	6.44%	1.24	[0.89,1.73]	0.202	0.92	[0.64,1.31]	0.634
≥ 50	45	857	5.25%	1.00	[1.00,1.00]	.	1.00	[1.00,1.00]	.
AIDS at baseline									
Yes	65	793	8.20%	1.06	[0.81,1.40]	0.655			
No	345	4460	7.74%	1.00	[1.00,1.00]	.			
CD4 count at baseline									
< 50	47	589	7.98%	1.10	[0.78,1.56]	0.573			
50-199	83	1035	8.02%	1.11	[0.83,1.48]	0.471			
200-349	113	1371	8.24%	1.14	[0.88,1.49]	0.312			
Missing	35	444	7.88%	1.09	[0.74,1.61]	0.662			
≥ 350	132	1814	7.28%	1.00	[1.00,1.00]	.			
HIV-RNA at baseline									
10.000-99.999	139	1843	7.54%	0.83	[0.62,1.10]	0.197			
≥ 100.000	133	1873	7.10%	0.78	[0.58,1.04]	0.086			
Missing	59	657	8.98%	1.00	[0.70,1.42]	0.998			
≤ 9.999	79	880	8.98%	1.00	[1.00,1.00]	.			
Nationality									
High prevalence countries	87	684	12.72%	1.92	[1.49,2.46]	0.000	1.36	[1.00,1.86]	0.047
Low prevalence countries	323	4569	7.07%	1.00	[1.00,1.00]	.	1.00	[1.00,1.00]	.
Population size of area of residence									
Rural areas	120	2069	5.80%	0.63	[0.50,0.79]	0.000	0.83	[0.65,1.06]	0.129
Capital cities	70	713	9.82%	1.11	[0.84,1.48]	0.455	1.44	[1.06,1.95]	0.019
Vienna	220	2471	8.90%	1.00	[1.00,1.00]	.	1.00	[1.00,1.00]	.
Year of ART Initiation									
2004-2007	167	972	17.18%	8.78	[6.06,12.71]	0.000	6.27	[4.29,9.16]	0.000
2008-2011	124	1339	9.26%	4.32	[2.96,6.30]	0.000	3.35	[2.28,4.94]	0.000
2012-2015	83	1383	6.00%	2.70	[1.81,4.02]	0.000	2.38	[1.59,3.57]	0.000
2016-2021	36	1559	2.31%	1.00	[1.00,1.00]	.	1.00	[1.00,1.00]	.

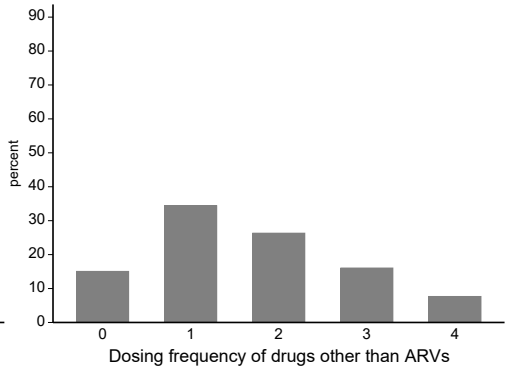
7.7 Frequency of drug dosing

7.7.1 Overview

24 of 4466 (0.5%) patients do not take any drugs at all and 30 (0.7%) patients have no ART but take other drugs. 653 (14,6%) patients are receiving ART only.

	Number of patients					
Dosing frequency	**0**	**1**	**2**	**3**	**4**	**Total**
Antiretrovirals (ARVs)	54	4230	178	4	0	4412
Drugs other than ARVs	677	1541	1180	721	347	4466
Overall dosing frequency	24	1466	1667	902	407	4466
Overall dosing frequency in patients with once daily ARVs	0	1453	1561	843	373	4230





7.7.2 Most frequent used regimen to treat HIV (March 2022)

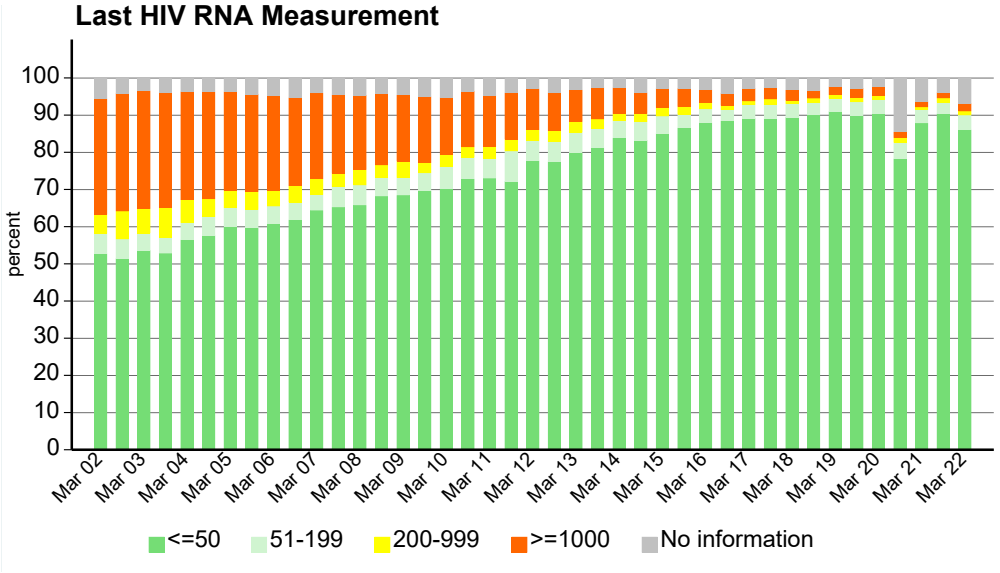
Regimen	Frequency	Percent
BGV FTC TAF	1,407	31.89
3TC DGV	560	12.69
3TC ABC DGV	515	11.67
FTC RPV TAF	391	8.86
DGV FTC TAF	193	4.37
EVG FTC TAF	188	4.26
3TC DOR TDF	181	4.10
DGV FTC TDF	146	3.31
3TC ABC RAL	83	1.88
DGV RPV	75	1.70
3TC ABC NVP	69	1.56
FTC RAL TDF	63	1.43
FTC RPV TDF	48	1.09
BLIND	47	1.07
EFV FTC TDF	47	1.07
FTC RAL TAF	46	1.04
Others	353	7.92
Total	**4412**	**100.00**

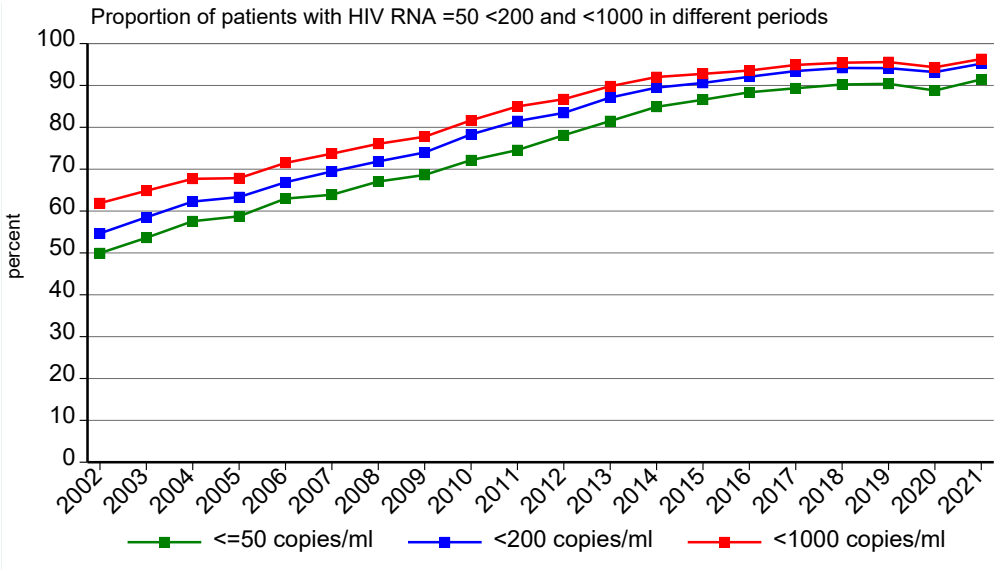
8 Disease progression and Response to ART

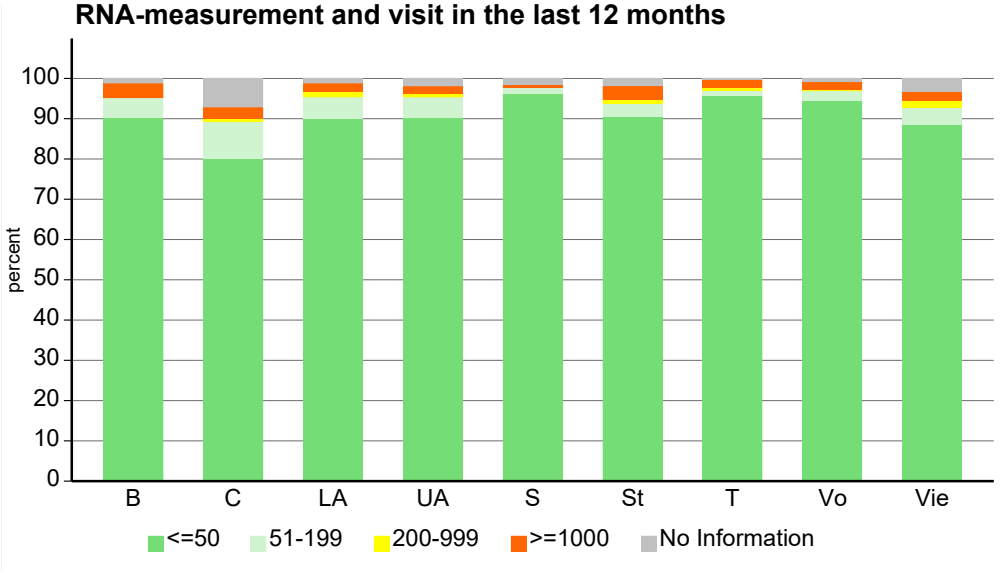
8.1 HIV RNA (viral load)

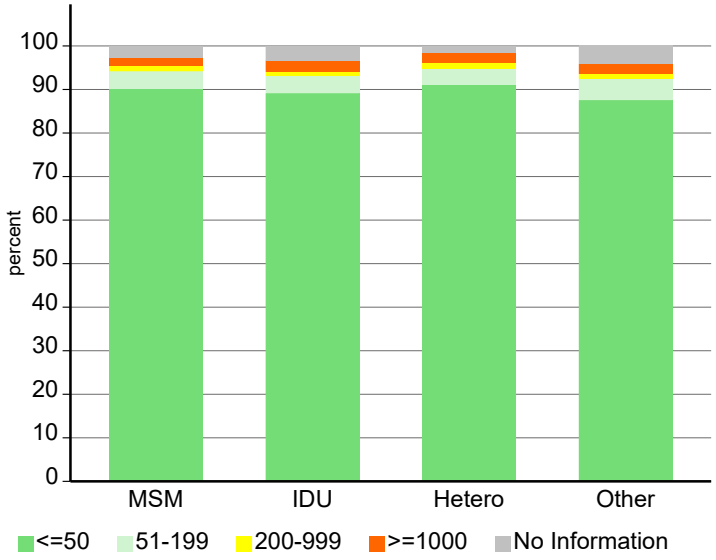
8.1.1 Last HIV RNA in patients currently in care regardless of ART

90.6% of the patients currently in care (4044 of 4466) 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

8.1.2 The continuum of care in Austria

Data from AHIVCOS were used to derive the four-stage continuum of HIV care and assessed for all patients and for men who have sex with men (MSM) for the years 2010 to 2016.

a. People living with HIV (PLHIV) estimates were obtained using back-calculation models (ECDC tool 1.3.0) to estimate HIV incidence and the undiagnosed fraction.
b. Proportion ever diagnosed
c. Proportion ever diagnosed who ever initiated ART
d. Proportion of them who were virally-suppressed (≤200 c/mL)
e. Proportion suppressed of all PLHIV (e) for all patients in Austria

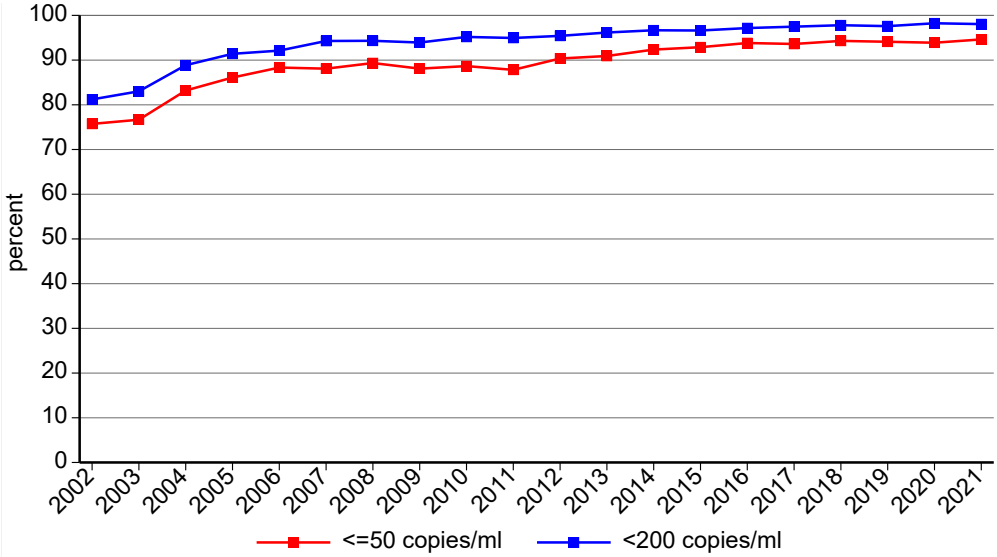
For high estimates patients lost to follow-up (LTFU, no contact 1.5 years before the end of the respective year) were excluded and for low estimates they were included. The preferred estimate was the mid-point between the high and low estimate.
Missing HIV-RNA was considered as unsuppressed.

Year	(a) PLHIV	(b) Diagnosed [estimated range]	(c) On ART Mean [low, high estimate]	(d) Suppressed Mean [high, low estimate]	(e) Suppressed of all PLHIV
2010	6254	84% [80%, 86%]	83% [76%, 89%]	79% [71%, 86%]	55%
2012	6594	88% [84%, 90%]	87% [81%, 93%]	81% [73%, 89%]	62%
2014	6864	90% [86%, 92%]	91% [85%, 96%]	84% [75%, 92%]	69%
2016	7079	92% [89%, 94%]	94% [89%, 98%]	85% [77%, 93%]	74%
2018	7480	94% [91%, 96%]	95% [91%, 99%]	85% [76%, 94%]	76%
2019	7655	94% [91%, 97%]	95% [91%, 99%]	85% [74%, 95%]	76%
2020	**7652**	**96% [93%, 99%]**	**96% [92%, 99%]**	**89% [72%, 95%] #**	**82%**
# Suppressed = Mean [Mean (low, high estimate)/High estimate]					

We conclude that Austria is nearing the 90-90-90 target of UNAIDS. Viral suppression was comparatively low and maybe explained substantially by transfer of care in Vienna and out-migration. This and the decrease in HIV incidence supports the hypothesis that the high estimate of being on ART and virally-suppressed is the more likely scenario. For more reliable nationwide estimates data from private physicians have to be included.

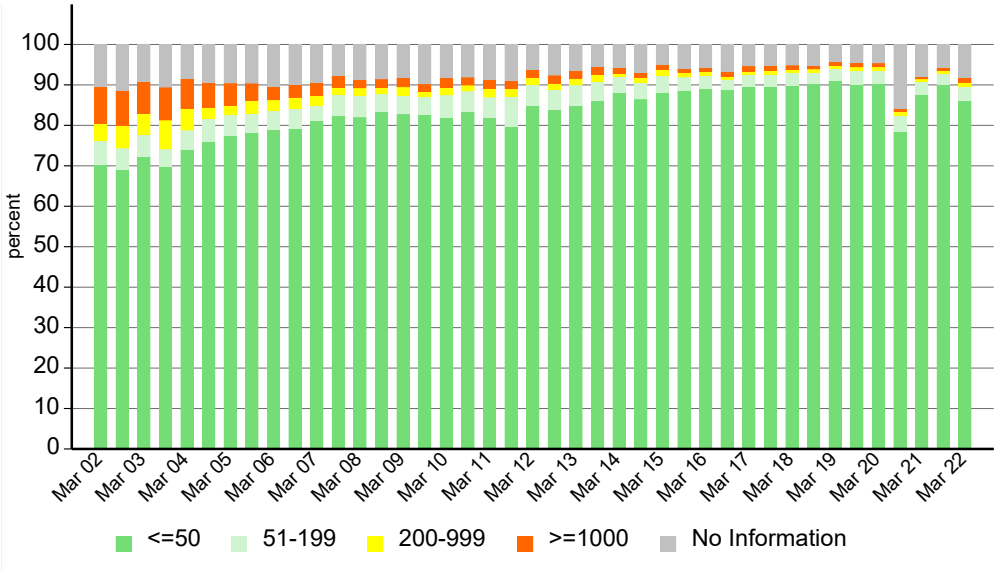
8.1.3 Last HIV RNA in patients on ART

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



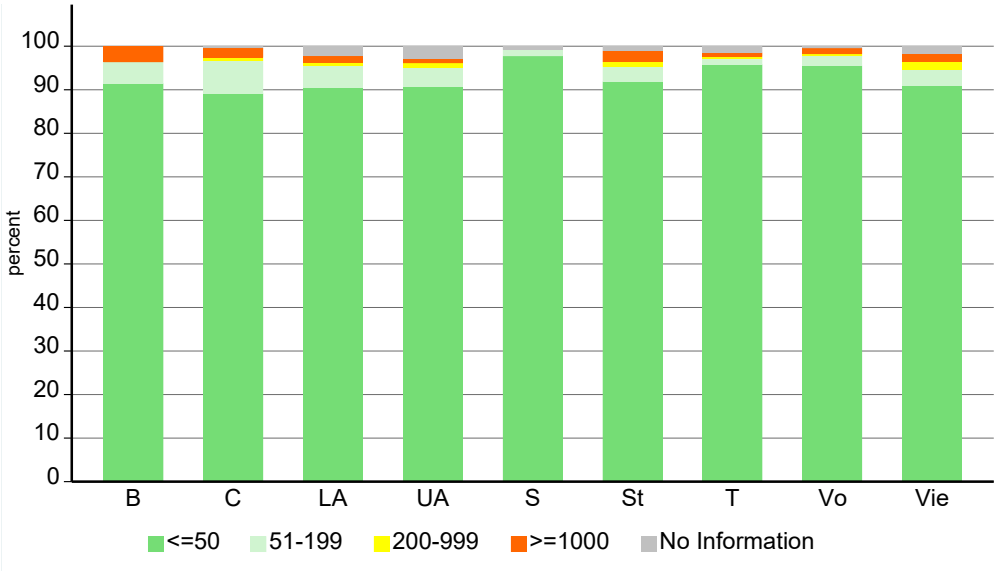
8.1.3.1 Last HIV RNA of patients on ART at different points in time

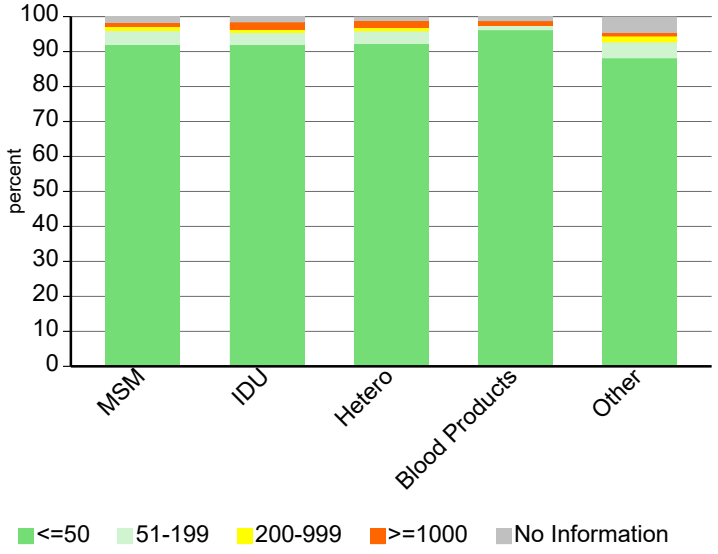
Patients currently in care, currently on ART and measurement of viral load at least 2.5 months after ART initiation



8.1.3.2 Last HIV RNA of patientst on ART according to transmission category

Patients in care and on ART within the last 12 months and measurement of viral load at least 2.5 months after ART initiation





8.1.4 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		
	130	**4759**	**2.73%**	**OR**	**[95% CI]**	**p value**	**OR**	**[95% CI]**	**p value**
Age									
< 30 years	10	247	4.05%	1.87	[0.93,3.74]	0.077	2.28	[1.06,4.90]	0.035
30-50 years	71	2293	3.10%	1.42	[0.98,2.05]	0.065	1.44	[0.96,2.15]	0.077
≥ 50	49	2219	2.21%	1.00	[1.00,1.00]	.	1.00	[1.00,1.00]	.
HIV transmission category									
Male IDU	9	400	2.25%	0.94	[0.46,1.93]	0.866	0.54	[0.25,1.14]	0.105
Female IDU	8	192	4.17%	1.78	[0.83,3.80]	0.139	0.93	[0.41,2.07]	0.851
Male heterosexual	22	900	2.44%	1.02	[0.62,1.70]	0.929	0.99	[0.58,1.69]	0.957
Female heterosexual	35	931	3.76%	1.60	[1.03,2.47]	0.037	1.19	[0.73,1.95]	0.488
Other	6	244	2.46%	1.03	[0.44,2.43]	0.947	0.87	[0.36,2.10]	0.757
MSM	50	2092	2.39%	1.00	[1.00,1.00]	.	1.00	[1.00,1.00]	.
Nationality									
Missing/unknown	1	16	6.25%	2.54	[0.33,19.44]	0.369	2.04	[0.25,16.50]	0.503
High prevalence	18	416	4.33%	1.72	[1.03,2.89]	0.039	1.15	[0.64,2.09]	0.640
Low prevalence	21	807	2.60%	1.02	[0.63,1.65]	0.941	0.96	[0.58,1.60]	0.875
Austria	90	3520	2.56%	1.00	[1.00,1.00]	.	1.00	[1.00,1.00]	.
Population size of area of residence									
Rural areas	49	2136	2.29%	0.63	[0.43,0.92]	0.015			
Capital cities	15	789	1.90%	0.52	[0.29,0.92]	0.023			
Vienna	66	1834	3.60%	1.00	[1.00,1.00]	.			
AIDS									
Yes	17	758	2.24%	0.79	[0.47,1.32]	0.369			
No	113	4001	2.82%	1.00	[1.00,1.00]	.			
CD4 Nadir									
<50	28	744	3.76%	1.84	[1.16,2.91]	0.010	1.71	[1.05,2.79]	0.030
50-199	44	1279	3.44%	1.67	[1.12,2.49]	0.012	1.54	[1.01,2.35]	0.047
≥200	57	2732	2.09%	1.00	[1.00,1.00]	.	1.00	[1.00,1.00]	.
ART initiation									
Before 1.1.1997	8	389	2.06%	0.73	[0.35,1.51]	0.396	0.36	[0.16,0.78]	0.010
After 1.1.1997	122	4370	2.79%	1.00	[1.00,1.00]	.	1.00	[1.00,1.00]	.
Ever ART interruptions									
None	65	3561	1.83%	0.21	[0.14,0.31]	0.000	0.15	[0.09,0.23]	0.000
1	22	672	3.27%	0.38	[0.22,0.64]	0.000	0.34	[0.20,0.59]	0.000
≥2	43	526	8.17%	1.00	[1.00,1.00]	.	1.00	[1.00,1.00]	.
Art duration									
< 9 months	7	239	2.93%	1.12	[0.52,2.42]	0.779	1.66	[0.74,3.72]	0.222
9-18 months	8	147	5.44%	2.13	[1.02,4.45]	0.044	3.10	[1.42,6.77]	0.005
> 18 months	115	4373	2.63%	1.00	[1.00,1.00]	.	1.00	[1.00,1.00]	.

10 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
BMG	Federal Ministry of Health
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

11 Austrian HIV Cohort Study Group

As of May 2022

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