AHIVCOS Austrian Cohort Study

HIV
AIDS
in
Austria

**46th Report of the
Austrian HIV Cohort Study**

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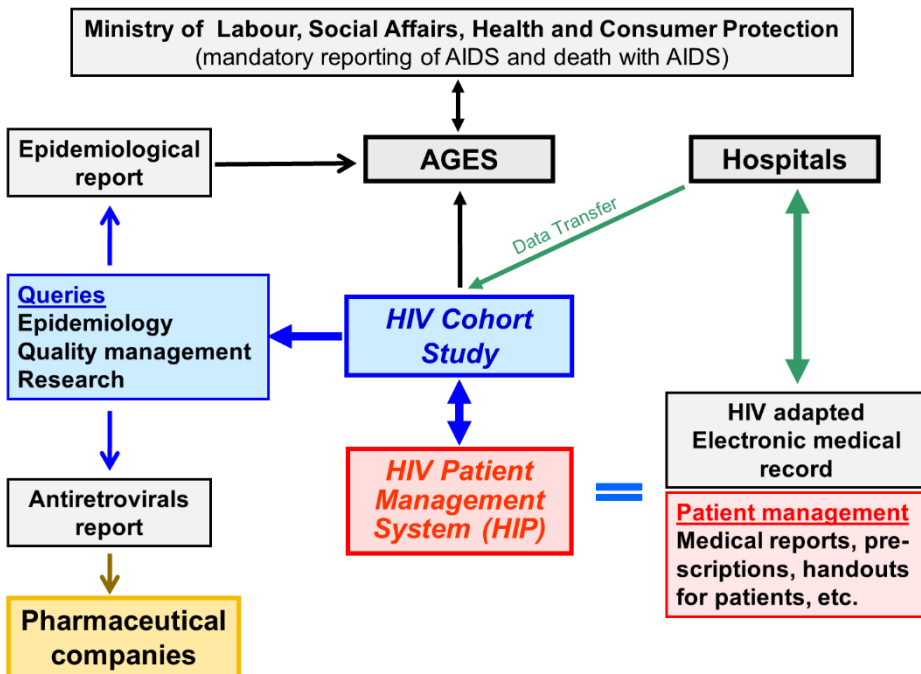
The development of the *HIV Patient Management System* incorporated the international standard format, the HIV Cohorts Data Exchange Protocol (HICDEP), so that data merging with networks of cohorts like ART-CC, EuroSIDA and RESPOND are greatly facilitated.

Centres of the Austrian HIV Cohort Study

AHIVCOS represents 64% of patients receiving ART (2022)

■	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, 11323 HIV infected patients providing 130243.69 years of follow-up have been recruited into the cohort study. We assume that there were more than 2884 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
01.03.2024	2809	3390	305	1305	584	1548	164	877	341	**11323**

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	823	64	765	**1652**
AKH Vienna	1380	423	924	**2727**
Favoriten Vienna	212	11	75	**298**
Linz	708	28	161	**897**
Salzburg	336	52	147	**535**
Innsbruck	770	247	102	**1119**
Feldkirch	126	20	10	**156**
Graz	495	34	219	**748**
Klagenfurt	244	12	51	**307**
Total	**5094**	**891**	**2454**	**8439**

|	Death		
	Death within the last 12 months	Death since more than 12 months	**Total**
Penzing Vienna	10	1147	**1157**
AKH Vienna	13	650	**663**
Favoriten Vienna	0	7	**7**
Linz	4	404	**408**
Salzburg	0	49	**49**
Innsbruck	9	420	**429**
Feldkirch	0	8	**8**
Graz	4	125	**129**
Klagenfurt	0	34	**34**
Total	**40**	**2844**	**2884**

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	2454	7548	32.51%	OR	(95%CI)	p-value	OR	(95%CI)	p-value
Demographic characteristics									
Age at last contact									
< 30	436	648	67.28%	9.84	[8.14,11.89]	<0.001	9.00	[7.34,11.05]	<0.001
30-50	1498	3892	38.49%	2.99	[2.67,3.36]	<0.001	2.80	[2.47,3.17]	<0.001
> 50	520	3008	17.29%	1.00		.	1.00		.
HIV transmission category									
Male IDU	246	660	37.27%	1.12	[0.94,1.33]	0.204	0.99	[0.82,1.19]	0.883
Female IDU	111	302	36.75%	1.09	[0.86,1.40]	0.471	1.05	[0.81,1.37]	0.699
Male hetero	341	1281	26.62%	0.68	[0.59,0.79]	<0.001	0.87	[0.73,1.02]	0.082
Female hetero	364	1380	26.38%	0.67	[0.59,0.77]	<0.001	0.71	[0.60,0.83]	<0.001
Other	209	515	40.58%	1.29	[1.06,1.55]	0.009	1.03	[0.82,1.28]	0.803
MSM	1183	3410	34.69%	1.00		.	1.00		.
Population size of residence area									
Vienna	1515	3393	44.65%	2.90	[2.62,3.21]	<0.001	2.81	[2.52,3.12]	<0.001
Missing	45	48	93.75%	53.91	[16.71,173.87]	<0.001	28.61	[8.51,96.18]	<0.001
Outside Vienna	894	4107	21.77%	1.00		.	1.00		.
Nationality									
High prevalence	284	703	40.40%	1.54	[1.31,1.81]	<0.001	1.42	[1.17,1.73]	<0.001
Low prevalence	514	1568	32.78%	1.11	[0.98,1.25]	0.097	0.86	[0.75,0.98]	0.027
Missing	73	98	74.49%	6.63	[4.20,10.49]	<0.001	3.52	[2.11,5.88]	<0.001
Austria	1583	5179	30.57%	1.00		.	1.00		.
Stage of disease									
AIDS									
Yes	422	1564	26.98%	0.72	[0.63,0.81]	<0.001	0.97	[0.85,1.11]	0.680
No	2032	5984	33.96%	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.
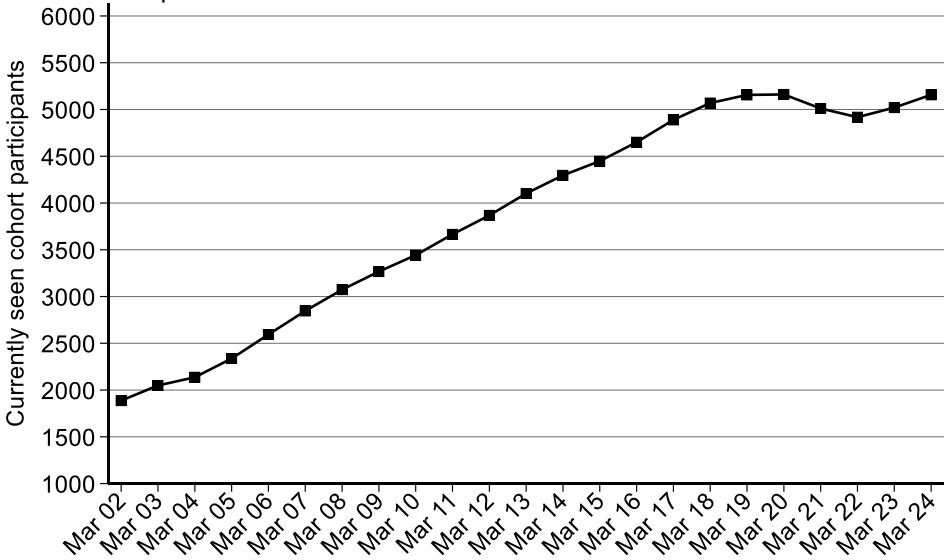
Number of patients currently in care

	Penzing Vienna	AKH Vienna	Favoriten Vienna	Linz	Salz-burg	Inns-bruck	Feld-kirch	Graz	Klagen-furt	Total
01.03.2024	835	1389	216	713	339	789	127	501	248	**5157**

Penzing — AKH Vienna — Favoriten — Linz — Salzburg — Innsbruck — Feldkirch — Graz — Klagenfurt
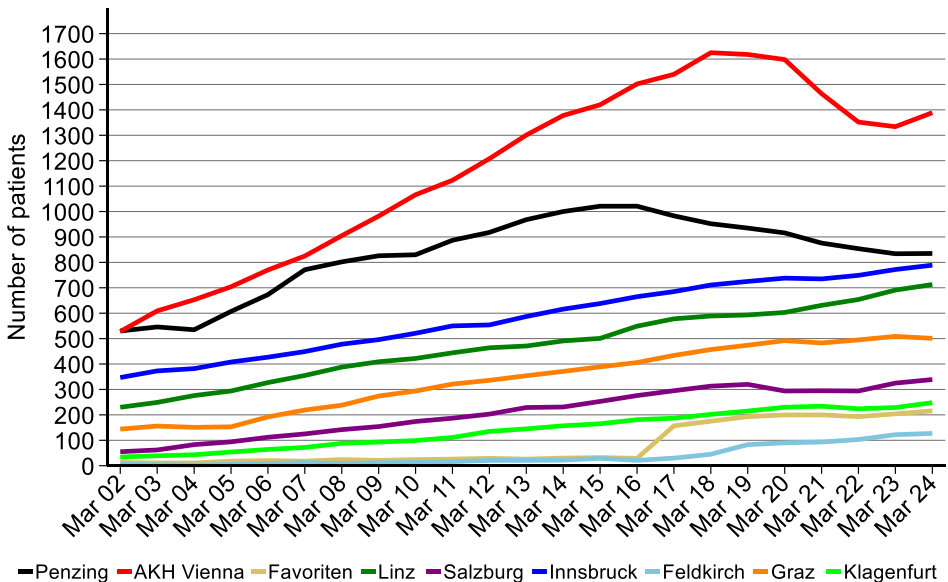
Number of currently seen patients by residence

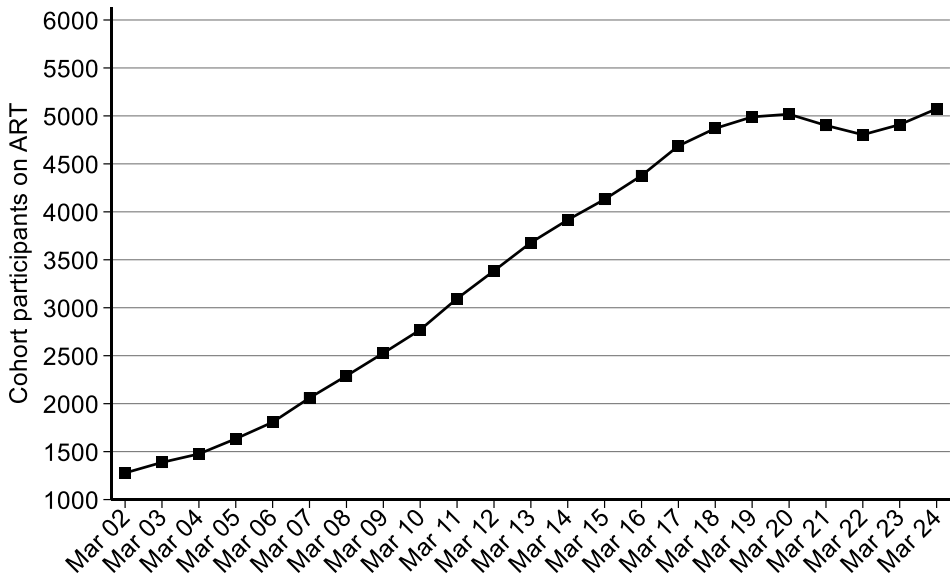|	HIV-centre									
	Penzing Vienna	AKH Vienna	Favoriten Vienna	Linz	Salz-burg	Inns-bruck	Feld-kirch	Graz	Klagen-furt	**Total**
Burgenland	21	30	10	0	0	2	0	22	0	**85**
Carinthia	0	0	0	3	6	7	0	15	238	**269**
Lower Austria	182	274	21	48	1	2	0	3	0	**531**
Upper Austria	3	5	1	637	30	3	1	1	0	**681**
Salzburg	1	1	1	6	256	32	1	1	0	**299**
Styria	3	8	1	5	8	4	0	449	4	**482**
Tyrol	0	0	0	1	3	592	0	1	0	**597**
Vorarlberg	1	0	0	1	0	116	124	0	0	**242**
Vienna	619	1065	177	9	1	11	0	5	2	**1889**
Foreign/missing	5	6	5	3	34	20	1	4	4	**82**
Total	**835**	**1389**	**216**	**713**	**339**	**789**	**127**	**501**	**248**	**5157**

4.3.2   Number of patients currently on antiretroviral therapy

5074 patients (98.4%) were on antiretroviral therapy in the 9 HIV treatment centres. Of the 83 patients not on treatment 39 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.).

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Number of participants currently on antiretroviral therapy

	Penzing Vienna	AKH Vienna	Favoriten Vienna	Linz	Salz-burg	Inns-bruck	Feld-kirch	Graz	Klagen-furt	**Total**
01.03.2024	817	1370	208	706	338	776	125	494	240	**5074**

Penzing **AKH Vienna** **Favoriten** **Linz** **Salzburg** **Innsbruck** **Feldkirch** **Graz** **Klagenfurt**
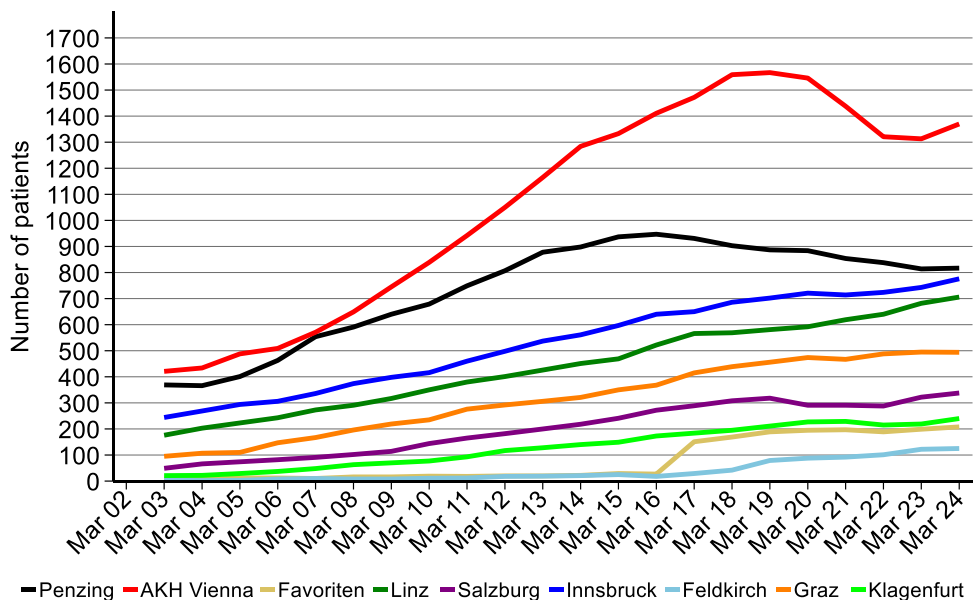
Number of participants currently on antiretroviral therapy by area of residence

	HIV-centre									
	Penzing Vienna	AKH Vienna	Favoriten Vienna	Linz	Salz-burg	Inns-bruck	Feld-kirch	Graz	Klagen-furt	**Total**
Burgenland	21	30	9	0	0	2	0	22	0	**84**
Carinthia	0	0	0	3	6	7	0	15	231	**262**
Lower Austria	180	270	21	48	1	2	0	3	0	**525**
Upper Austria	3	5	1	631	30	3	0	1	0	**674**
Salzburg	1	1	1	6	255	31	1	1	0	**297**
Styria	3	8	1	5	8	4	0	443	3	**475**
Tyrol	0	0	0	1	3	584	0	1	0	**589**
Vorarlberg	1	0	0	1	0	114	123	0	0	**239**
Vienna	605	1052	171	8	1	10	0	5	2	**1854**
Foreign/missing	3	4	4	3	34	19	1	3	4	**75**
Total	**817**	**1370**	**208**	**706**	**338**	**776**	**125**	**494**	**240**	**5074**

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

The Dachverband der Sozialversicherungsträger recorded 7768 persons in Austria receiving ART in 2022. According to the ECDC modelling tool 8 (chapter 10.4.2) the proportion of PLHIV on ART in 2022 is estimated to be between 86.5% and 92.2%. Thus, the estimate for PLHIV in Austria ranges from 8400 to 9000 for end of 2022.

The number of PLHIV analysed completely by the modelling tool of ECDC reveals 7596 PLHIV within AHIVCOS for the end of 2022 (a delay of one year for the estimate is caused by the ascertainment of deaths). AHIVCOS captures 64% of all PLHIV receiving ART. Assuming that AHIVCOS is representative for Austria, the overall estimate for PLHIV therefore sums up to 11 860, which is an overestimate, since the ascertainment of out-migration, persons who left the country is very incomplete (e.g. migrant workers from other European countries mainly in the tourism industry, rejection of asylum application or voluntary return to home country).

5 HIV/AIDS Surveillance in Austria

5.1 HIV, AIDS and Death in AHIVCOS per calendar year
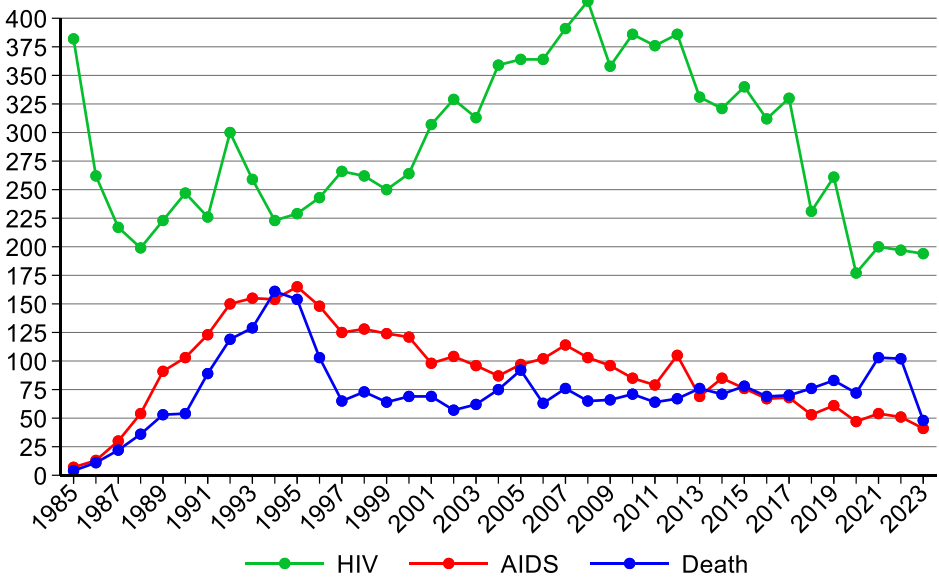
Year	HIV	AIDS	DEATH	Year	HIV	AIDS	DEATH
1985	382	7	4	2005	364	97	92
1986	262	13	11	2006	364	102	63
1987	217	30	22	2007	391	114	76
1988	199	54	36	2008	415	103	65
1989	223	91	53	2009	358	96	66
1990	247	103	54	2010	386	85	71
1991	226	123	89	2011	376	79	64
1992	300	150	119	2012	386	105	67
1993	259	155	129	2013	331	69	76
1994	223	154	161	2014	321	85	71
1995	229	165	154	2015	340	76	78
1996	243	148	103	2016	312	67	69
1997	266	125	65	2017	330	68	70
1998	262	128	73	2018	231	53	76
1999	250	124	64	2019	261	61	83
2000	264	121	69	2020	177	47	72
2001	307	98	69	2021	200	54	103
2002	329	104	57	2022	197	51	102
2003	313	96	62	2023	194	41	48
2004	359	87	75	2024	29	7	3
				Total	**11323**	**3536**	**2884**

5.2   Mode of transmission

5.2.1   Transgender

There are 17 transgender women in the Austrian HIV Cohort Study.
One of them died and median age at diagnosis is 34.2. Thirteen are Austrian nationality.
Thirteen had a visit in the last 12 months. Median age of those with a follow up in the last 12 months is 49.4 (mean 49.0).

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

5.2.2   All modes of transmission
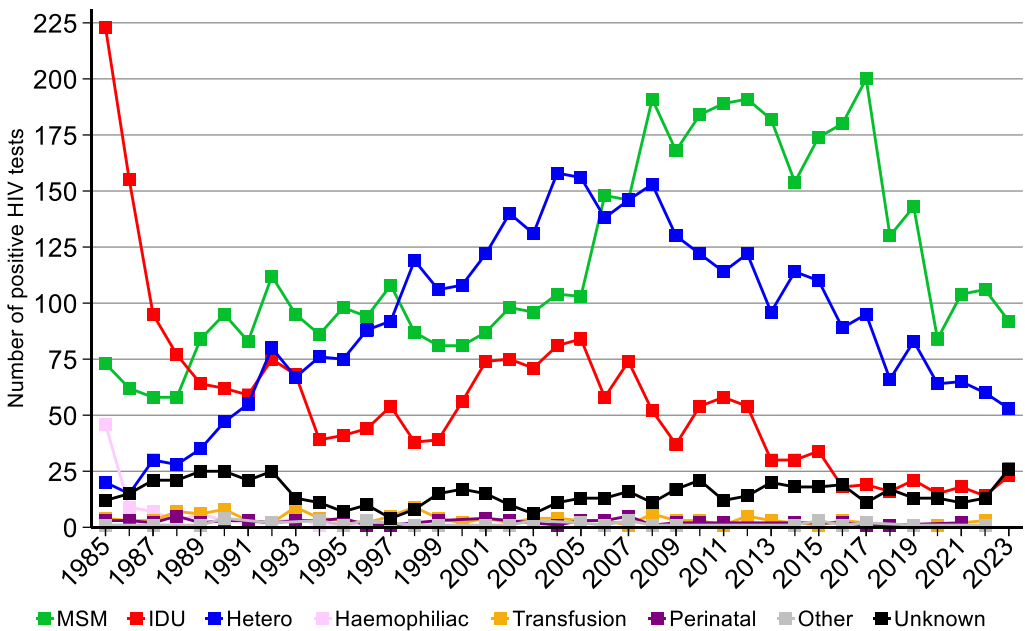
The abbreviation MSM is used for „Men who have sex with men". IDU means „Injecting Drug Use". The category IDU also includes men who are both MSM and IDU. The category "blood products" includes cohort participants who have received coagulation compounds or blood transfusions. Among the patients with a follow-up in the last 12 months, 38.44% have been infected through heterosexual contacts, 43.91% through homosexual contacts and 11.90% through the injection of drugs.

		BMSGPK	AHIVCOS								
						Heterosexually					
Year	Total	MSM		IDU		infected		Others		Total	Women	
1998	313	87	33.21%	38	14.50%	119	45.42%	18	6.87%	262	60	22.90%
1999	339	81	32.40%	39	15.60%	106	42.40%	24	9.60%	250	69	27.60%
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	29.79%	75	22.80%	140	42.55%	16	4.86%	329	92	27.96%
2003	423	96	30.67%	71	22.68%	131	41.85%	15	4.79%	313	94	30.03%
2004	470	104	28.97%	81	22.56%	158	44.01%	16	4.46%	359	108	30.08%
2005	453	103	28.30%	84	23.08%	156	42.86%	21	5.77%	364	100	27.47%
2006	435	148	40.66%	58	15.93%	138	37.91%	20	5.49%	364	88	24.18%
2007	515	146	37.34%	74	18.93%	146	37.34%	25	6.39%	391	90	23.02%
2008	505	191	46.02%	52	12.53%	153	36.87%	19	4.58%	415	98	23.61%
2009	507	168	46.93%	37	10.34%	130	36.31%	23	6.42%	358	79	22.07%
2010	487	184	47.67%	54	13.99%	122	31.61%	26	6.74%	386	76	19.69%
2011	525	189	50.27%	58	15.43%	114	30.32%	15	3.99%	376	79	21.01%
2012	523	191	49.48%	54	13.99%	122	31.61%	19	4.92%	386	80	20.73%
2013	481	182	54.98%	30	9.06%	96	29.00%	23	6.95%	331	53	16.01%
2014	403	154	47.98%	30	9.35%	114	35.51%	23	7.17%	321	73	22.74%
2015	428	174	51.18%	34	10.00%	110	32.35%	22	6.47%	340	47	13.82%
2016	447	180	57.69%	18	5.77%	89	28.53%	25	8.01%	312	53	16.99%
2017	510	200	60.61%	19	5.76%	95	28.79%	16	4.85%	330	56	16.97%
2018	323 / 74*	130	56.28%	16	6.93%	66	28.57%	19	8.23%	231	39	16.88%
2019	336 / 94*	143	54.79%	21	8.05%	83	31.80%	14	5.36%	261	40	15.33%
2020	283 / 49*	84	47.46%	15	8.47%	64	36.16%	14	7.91%	177	31	17.51%
2021	310 / 66*	104	52.00%	18	9.00%	65	32.50%	13	6.50%	200	33	16.50%
2022	395 / 78*	106	53.81%	14	7.11%	60	30.46%	17	8.63%	197	36	18.27%
2023	341 / 60*	92	47.42%	23	11.86%	53	27.32%	26	13.40%	194	37	19.07%
2024		14	48.28%	2	6.90%	9	31.03%	4	13.79%	29	4	13.79%

*second number tested anonymously since 2018

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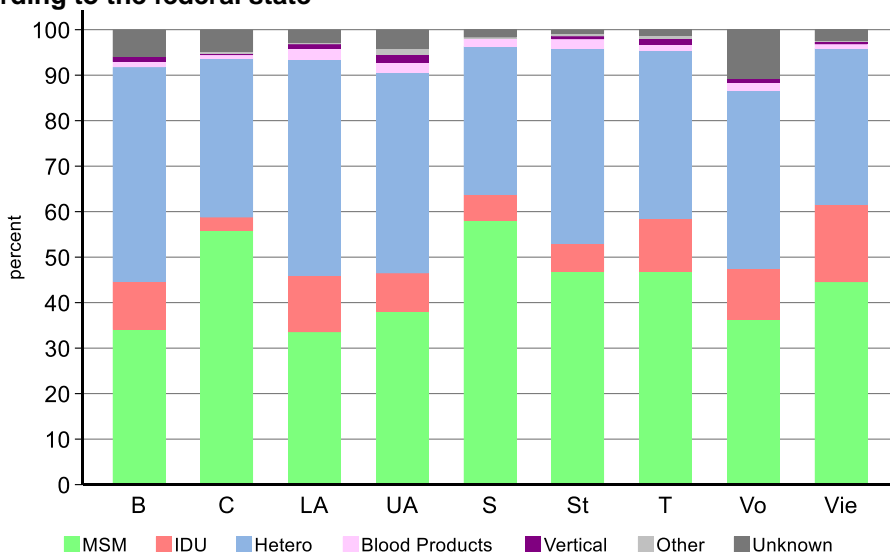
5.2.3 Categories of transmission

Men

MSM	53.0
IDU	17.9
Hetero	20.8
Other	8.3

Women

IDU	24.5
Hetero	67.8
Other	7.6
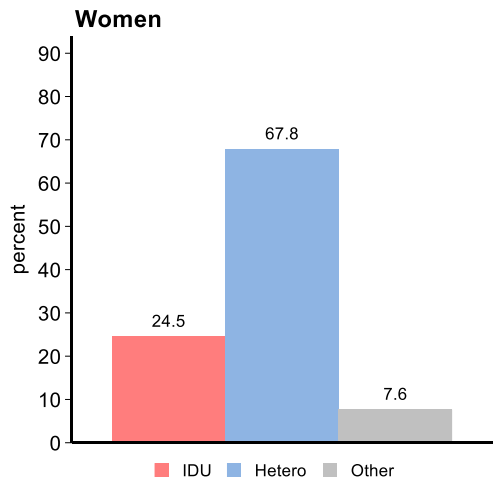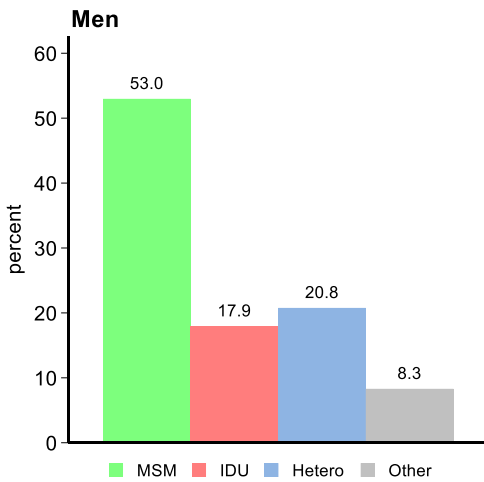
5.2.3.1 Categories of heterosexually acquired infections

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.

All

Originating from high prevalence	27.6
Sex with MSM	1.2
Sex with IDU	5.5
Sex with hemophilac	0.5
Sex with persons from high prevalence	16.8
Sex with HIV+ persons not matching above	11.7
Believes to be infected heterosexually	33.1
Heterosexual with no information	3.7

Men

Women

Sub-categories of heterosexually acquired infections

Legend:
- Origin high prevalence country
- Sex with MSM
- Sex with IDU
- Sex with hemophilac
- Sex with high prevalence
- Sex with HIV+ other
- Believes hetero
- Hetero with no information

5.2.4   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.

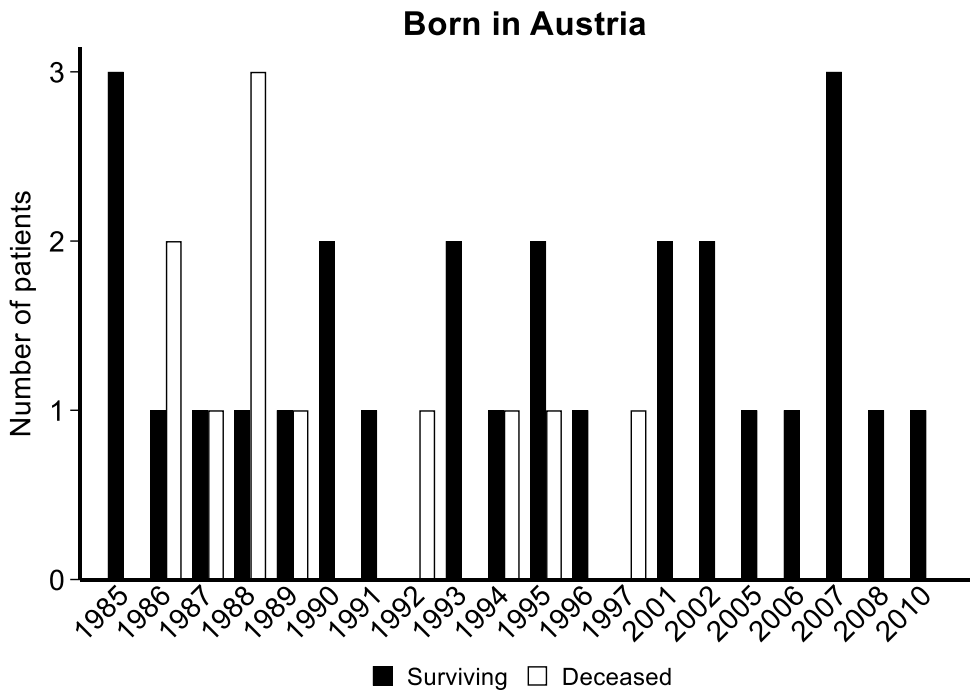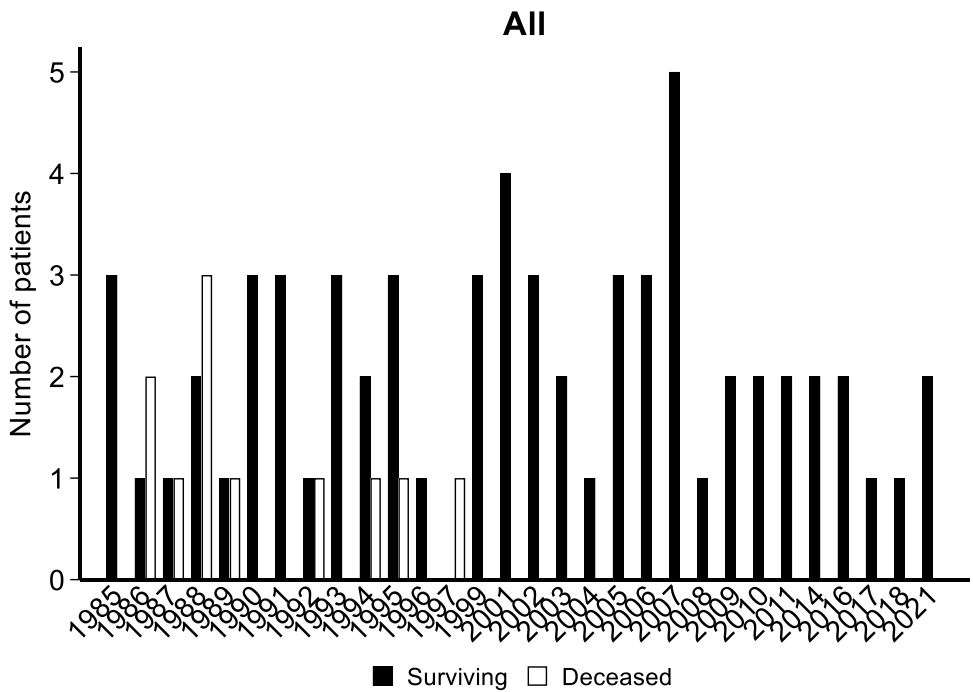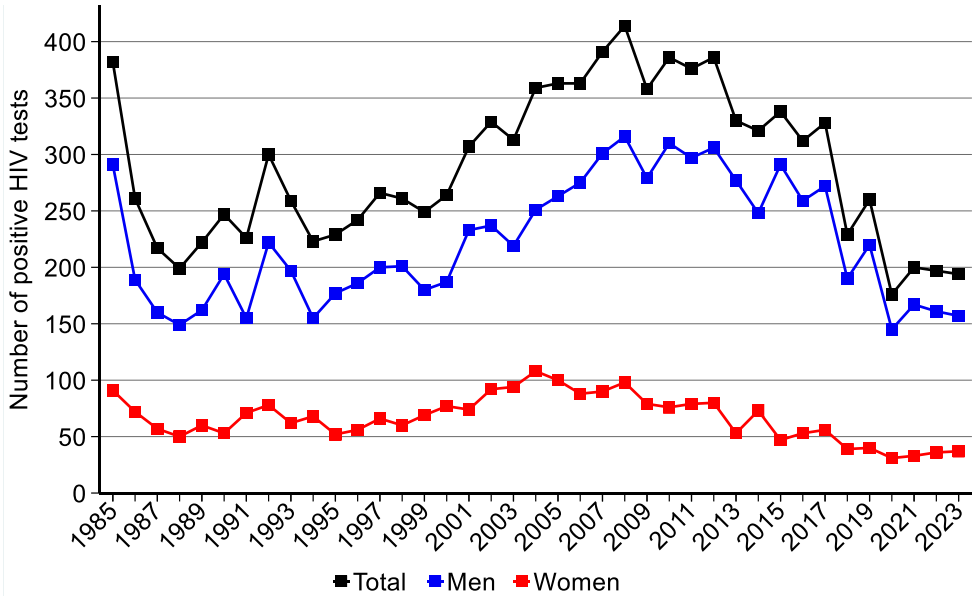|	Living participants		Deceased participants	Total
	<18 years	>18 years		
Burgenland	0	2	0	**2**
Carinthia	0	1	0	**1**
Lower Austria	1	5	0	**6**
Upper Austria	2	11	1	**14**
Salzburg	1	0	0	**1**
Styria	0	4	0	**4**
Tyrol	3	4	4	**11**
Vorarlberg	1	1	3	**5**
Vienna	3	19	3	**25**
Missing residency	0	1	0	**1**
Foreign	2	2	0	**4**
Total	**13**	**50**	**11**	**74**

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

Surviving Deceased

Born in Austria

Number of patients

Surviving Deceased

5.3   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 (32.9%) and Upper Austria (30.5%).
In the subgroup of heterosexually acquired infections, the rate of the women is 51.9%. It is highest Styria (56.8%) and Carinthia (56.4%).

Proportion of women in participants with a follow-up in the last 12 months according to federal states
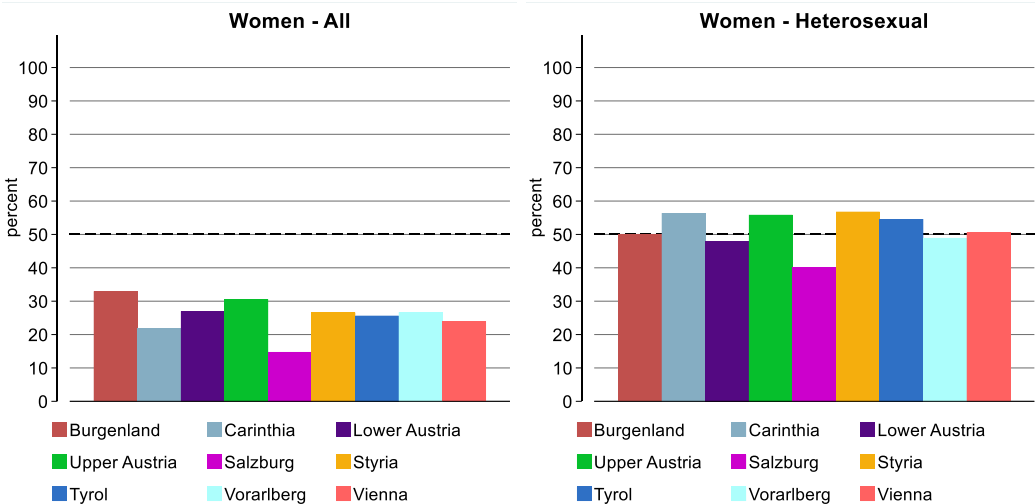
5.4   Age
5.4.1   Age at time of HIV diagnosis

Median age at time of the HIV diagnosis

Age at time of the HIV diagnosis

MSM

Male heterosexual

Female heterosexual
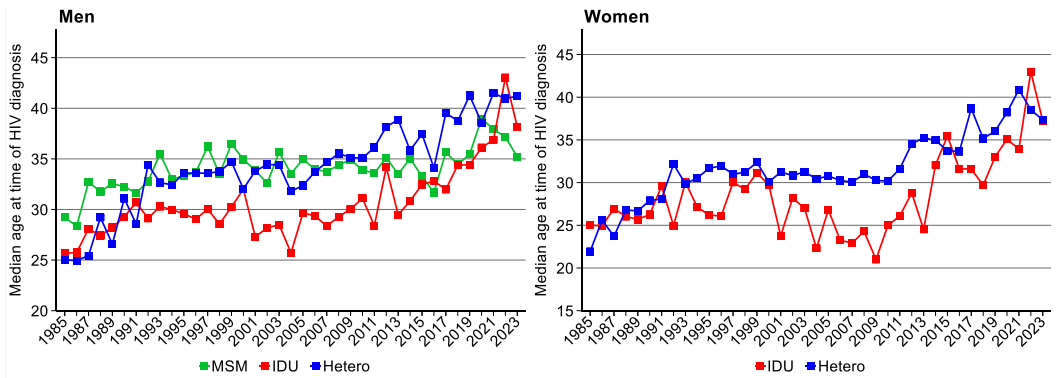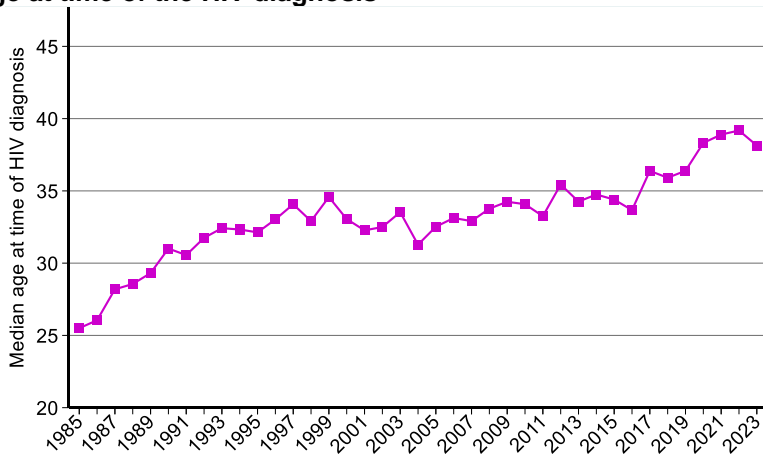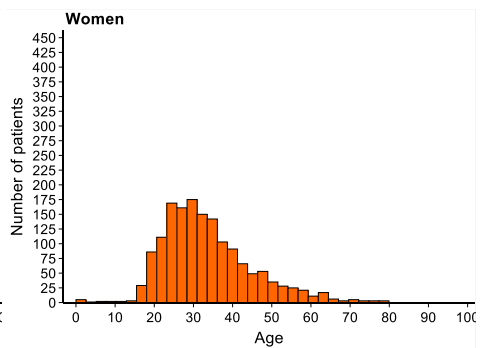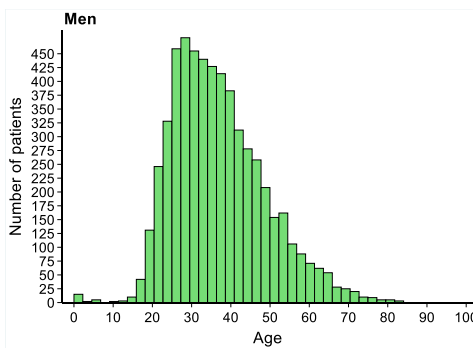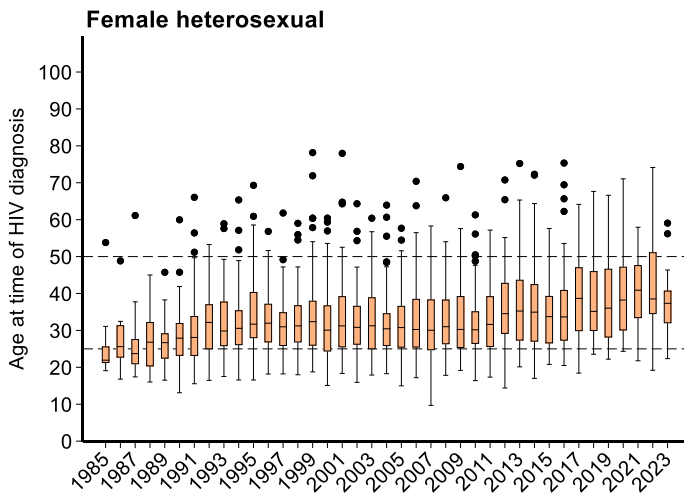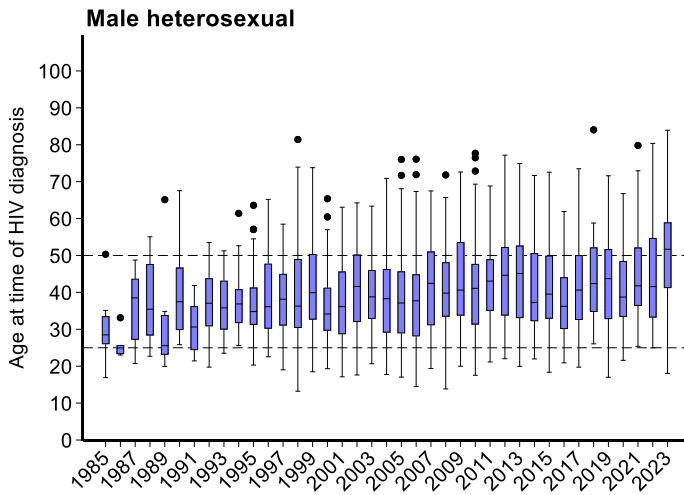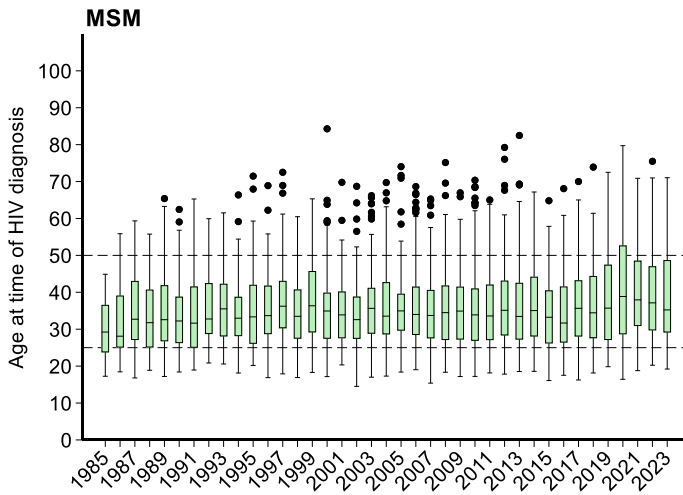
5.4.2　　Age of patients currently in care

Overall, median age increased from 39.4 in March 2002 to 50.5 in March 2024. In MSM, median age increased from 40.6 in March 2002 to 49.5 in March 2024, in men (not MSM) from 39.6 to 53.6 and in women from 37.0 to 49.5.
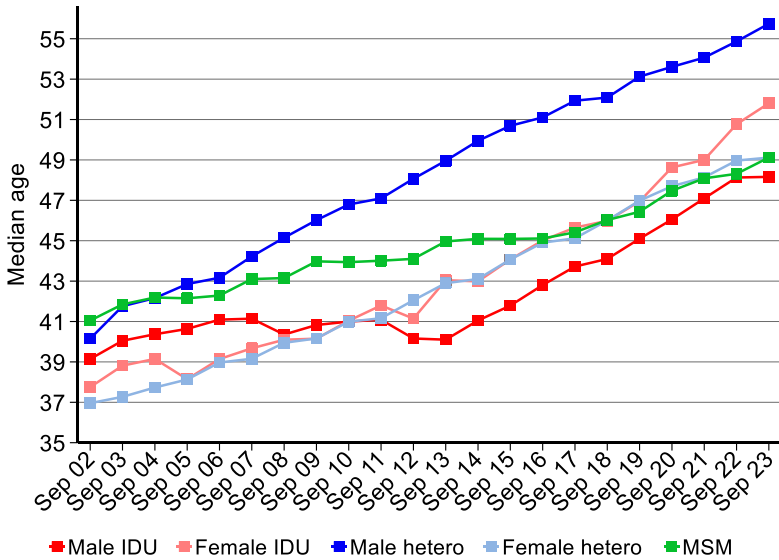
Median and average age are 50.7 and 50.8 years, respectively. 23.6% are older than 60 years, 51.9% are older than 50 years.
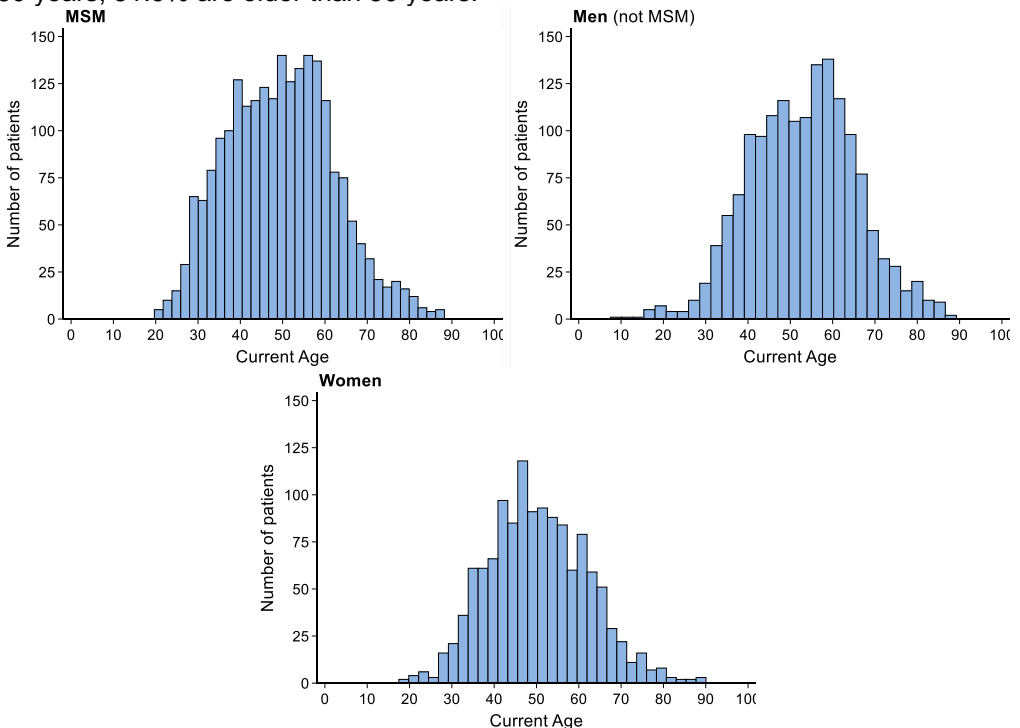
Age across the federal states: follow-up in the last 12 months

Federal state	Median Age years	≥50 years	≥60 years	≥75 years
Burgenland	52.5	62.4%	27.1%	3.5%
Carinthia	51.6	56.1%	23.0%	1.9%
Lower Austria	53.1	58.0%	26.9%	6.2%
Upper Austria	50.5	51.0%	26.8%	3.4%
Salzburg	49.7	48.7%	20.8%	3.0%
Styria	49.9	49.8%	19.4%	2.3%
Tyrol	53.4	58.4%	28.0%	3.7%
Vorarlberg	51.7	53.8%	23.8%	5.0%
Vienna	49.3	48.2%	21.5%	3.1%
Total	**50.7**	**51.9%**	**23.6%**	**3.5%**

Age in Injecting Drug Users according to federal states

25
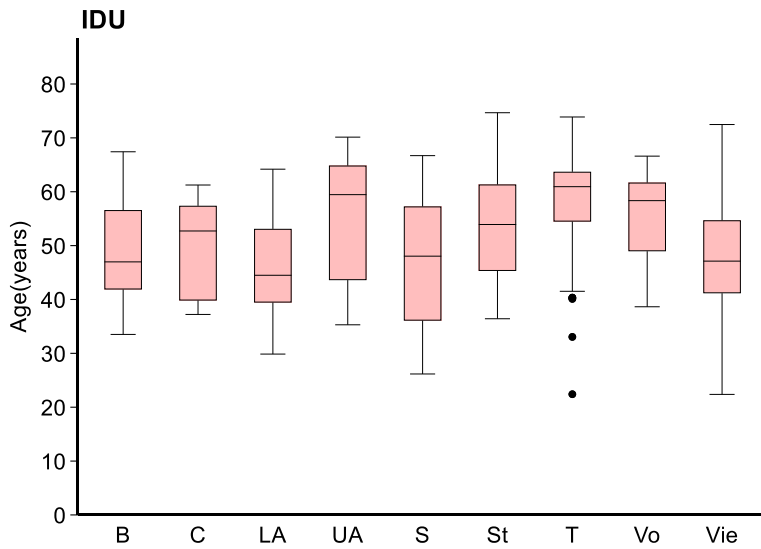
5.5 Nationality and country of birth

Nationality | Country of birth
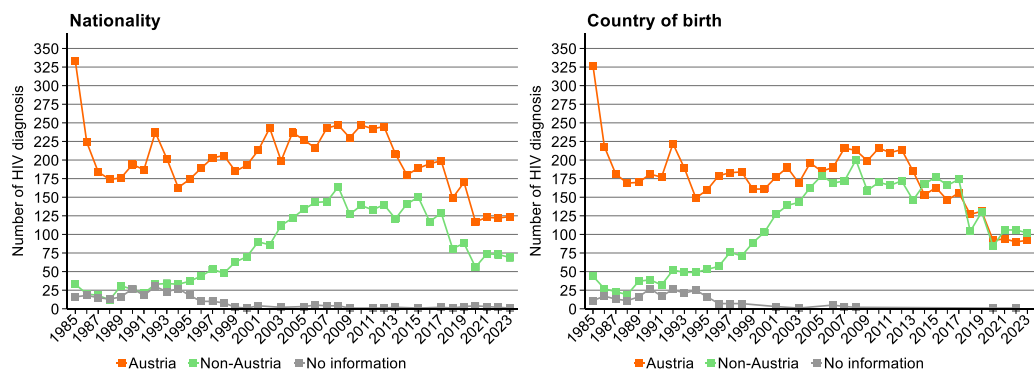
Year	BMSGPK Total	Austria		Low prevalence countries		High prevalence countries		Missing value		Total
1998	313	206	78.63%	30	11.45%	18	6.87%	8	3.05%	**262**
1999	339	185	74.00%	43	17.20%	20	8.00%	2	0.80%	**250**
2000	428	193	73.11%	38	14.39%	32	12.12%	1	0.38%	**264**
2001	402	213	69.38%	51	16.61%	39	12.70%	4	1.30%	**307**
2002	442	243	73.86%	51	15.50%	35	10.64%	0	0.00%	**329**
2003	423	199	63.58%	60	19.17%	52	16.61%	2	0.64%	**313**
2004	470	237	66.02%	64	17.83%	58	16.16%	0	0.00%	**359**
2005	453	227	62.36%	60	16.48%	74	20.33%	3	0.82%	**364**
2006	435	216	59.34%	81	22.25%	62	17.03%	5	1.37%	**364**
2007	515	243	62.15%	81	20.72%	63	16.11%	4	1.02%	**391**
2008	505	247	59.52%	109	26.27%	55	13.25%	4	0.96%	**415**
2009	507	230	64.25%	80	22.35%	47	13.13%	1	0.28%	**358**
2010	487	247	63.99%	106	27.46%	33	8.55%	0	0.00%	**386**
2011	525	242	64.36%	103	27.39%	30	7.98%	1	0.27%	**376**
2012	523	245	63.47%	103	26.68%	37	9.59%	1	0.26%	**386**
2013	481	208	62.84%	98	29.61%	23	6.95%	2	0.60%	**331**
2014	403	180	56.07%	105	32.71%	36	11.21%	0	0.00%	**321**
2015	428	189	55.59%	113	33.24%	37	10.88%	1	0.29%	**340**
2016	447	195	62.50%	90	28.85%	27	8.65%	0	0.00%	**312**
2017	510	199	60.30%	111	33.64%	18	5.45%	2	0.61%	**330**
2018	323 / 74*	149	64.50%	71	30.74%	10	4.33%	1	0.43%	**231**
2019	336 / 94*	170	65.13%	74	28.35%	14	5.36%	3	1.15%	**261**
2020	283 / 49*	117	66.10%	48	27.12%	8	4.52%	4	2.26%	**177**
2021	310 / 66*	123	61.50%	64	32.00%	10	5.00%	3	1.50%	**200**
2022	395 / 78*	122	61.93%	67	34.01%	6	3.05%	2	1.02%	**197**
2023	341 / 60*	124	63.92%	60	30.93%	9	4.64%	1	0.52%	**194**
2024		18	62.07%	9	31.03%	1	3.45%	1	3.45%	**29**

* second number tested anonymously since 2018

5.5.2   Nationality: HIV diagnoses between 2021 and 2023

Austria ■ Southeastern and Eastern Europe ■ Former USSR ■ Western Europe ■ Africa ■ Asia ■ Others/missing value

HIV diagnosis 2021 N=200	
Afghanistan	3
Americas	1
Austria	123
Armenia	1
Bosnia and Herzegovina	1
Brazil	1
Bulgaria	1
Chile	1
China	1
Croatia	3
Occupied Palestinian Territory	1
Egypt	1
Germany	5
Ghana	2
Haiti	1
Hungary	3
Italy	3
Kenya	1
Republic of Korea	1
Lithuania	1
Nigeria	2
Philippines	1
Poland	1
Portugal	3
Romania	6
Russian Federation	1
Saint Vincent and the Grenadines	1
Serbia	2
Slovakia	4
Slovenia	1
Somalia	2
Zimbabwe	1
Switzerland	1
Syrian Arab Republic	1
Thailand	2
Tunisia	1
Turkey	4
Ukraine	8
Unknown	3

HIV diagnosis 2022 N=197	
Afghanistan	3
Austria	122
Bosnia and Herzegovina	2
Brazil	4
Bulgaria	1
Cameroon	2
Canada	1
Colombia	1
Croatia	3
Czech Republic	1
Egypt	1
France	1
Georgia	1
Occupied Palestinian Territory	1
Greece	2
Hungary	2
Iran	3
Italy	4
Kenya	1
Poland	3
Portugal	1
Romania	6
Russian Federation	2
Serbia	4
Slovakia	3
Slovenia	1
Somalia	1
South Africa	1
Spain	1
Switzerland	1
Syrian Arab Republic	1
Turkey	2
Ukraine	12
Unknown	2

HIV diagnosis 2023 N=194	
Afghanistan	4
Azerbaijan	1
Argentina	1
Austria	124
Bosnia and Herzegovina	5
Bulgaria	2
Cameroon	2
China	1
Colombia	1
Democratic Republic of the Congo	1
Dominican Republic	1
Ethiopia	1
France	1
Georgia	1
Germany	4
Ghana	1
Indonesia	2
Cote d'Ivoire	1
Republic of Moldova	1
Nigeria	2
Pakistan	1
Poland	2
Portugal	1
Romania	9
Russian Federation	1
Serbia	1
Slovakia	1
Slovenia	1
Somalia	2
Switzerland	1
Syrian Arab Republic	3
The former Yugoslav Republic of Macedonia	2
Turkey	6
Ukraine	5
Unknown	1

5.5.3 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%.

5.5.4 Refugees from Ukraine (after March 1st 2022)

Center	Men	Women	Children	ART	Total
Penzing	6	8	0	14	14
AKH Vienna	12	17	0	26	29
Favoriten	4	3	0	7	7
Linz	7	17	2	25	26
Salzburg	3	4	0	7	7
Innsbruck	3	7	3	13	13
Feldkirch	2	2	0	4	4
Graz	4	13	0	17	17
Klagenfurt	0	3	0	3	3
Total	41	74	5	**116**	120

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 245/µl.

CD4 nadir (patients with follow-up the last 12 months)
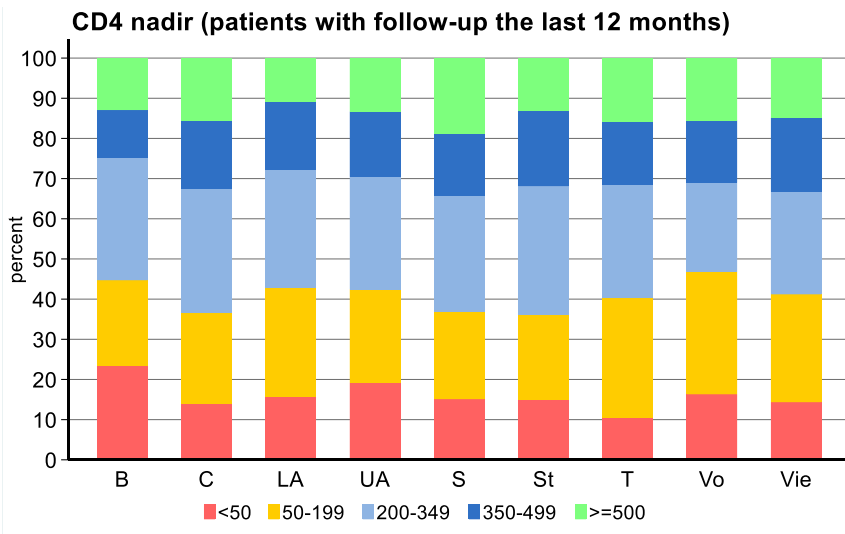
5.6.2 Proportion of Patients with AIDS

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
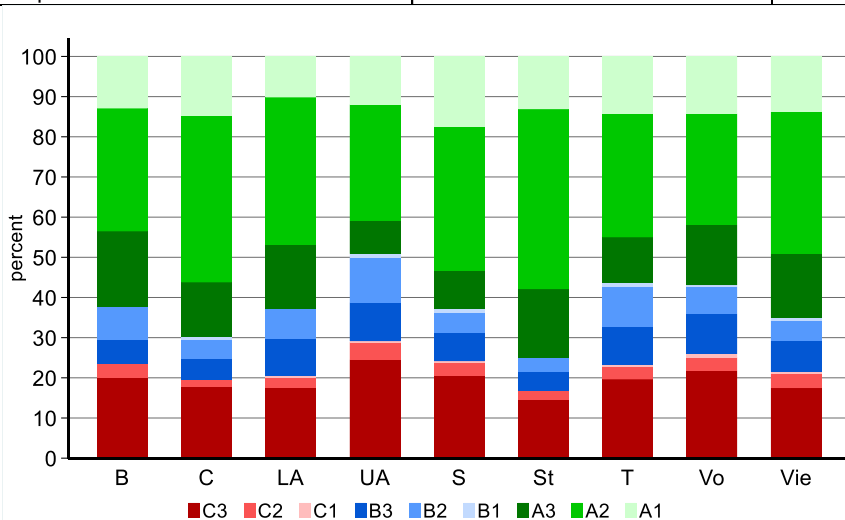
6 Diagnosis of HIV and presentation to an HIV centre

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, 464 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	219	2.6	100.8	39	4.2	101.4	240.0	88.0	480.0
2000	257	1.1	135.9	56	2.3	92.0	361.0	156.0	566.0
2005	357	0.7	94.2	84	1.2	71.4	354.0	165.0	538.0
2006	354	0.7	68.2	58	1.1	31.2	371.0	193.0	579.0
2007	380	0.7	82.5	73	1.8	61.3	327.0	153.0	565.0
2008	405	0.8	80.3	52	1.6	84.9	398.0	228.0	570.0
2009	346	0.6	74.7	37	0.9	49.0	343.5	197.0	563.0
2010	375	0.6	72.6	54	0.7	69.5	398.0	199.0	643.0
2011	365	0.6	57.4	56	1.5	38.8	379.0	221.0	560.0
2012	381	0.6	47.0	54	0.9	45.9	364.0	168.0	584.0
2013	319	0.5	41.6	29	1.5	40.9	401.0	209.0	627.0
2014	311	0.7	46.6	30	1.8	51.8	383.0	202.0	586.0
2015	325	0.5	35.2	34	1.2	38.5	382.0	179.0	571.0
2016	301	0.4	14.0	17	0.7	7.7	370.0	164.0	580.0
2017	320	0.4	29.2	19	1.3	45.7	389.0	196.0	584.0
2018	226	0.4	40.7	15	0.6	38.9	385.0	216.0	623.0
2019	258	0.4	24.0	21	1.9	13.8	369.0	165.0	588.0
2020	174	0.4	12.0	15	2.2	33.4	351.0	190.0	554.0
2021	196	0.4	2.7	16	0.5	21.1	301.5	108.0	513.5
2022	195	0.4	3.2	14	0.7	9.9	322.0	122.0	524.0
2023	189	0.3	2.6	20	0.6	4.6	376.0	186.0	561.0
2024	22	0.3	0.6	2	0.2	0.4	221.0	134.0	413.0

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

Male IDU

Female IDU

Male heterosexual

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

Female heterosexual

MSM

Other

legend: <50, 50-199, 200-349, 350-499, >=500, No CD4 within 6 months

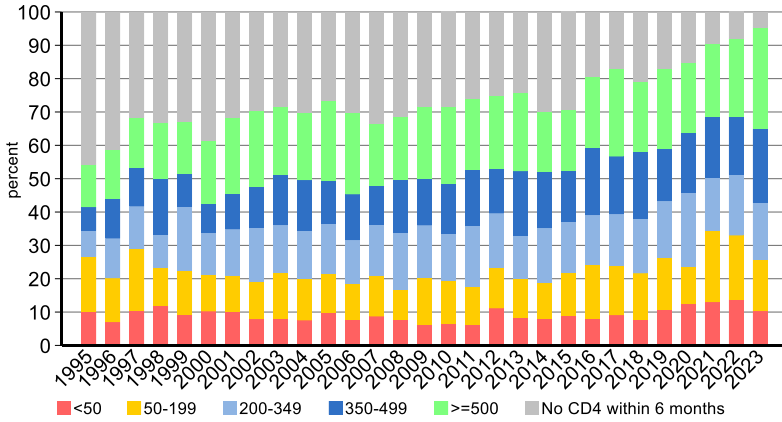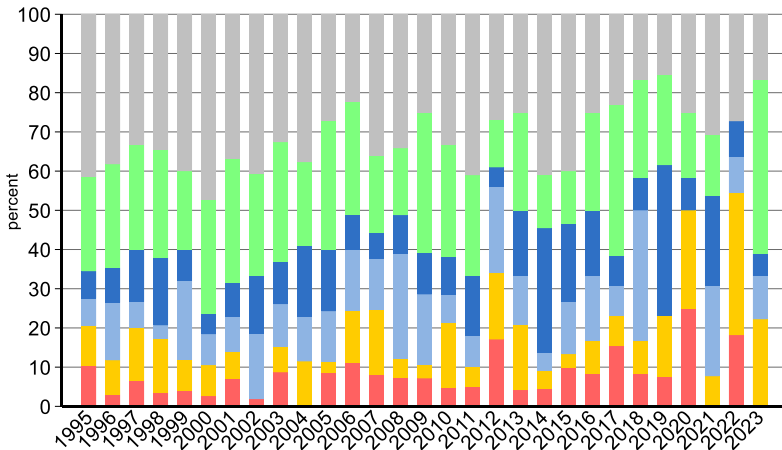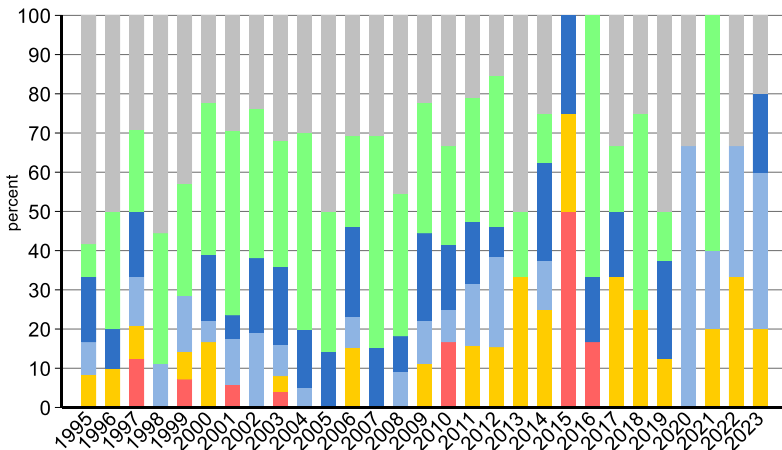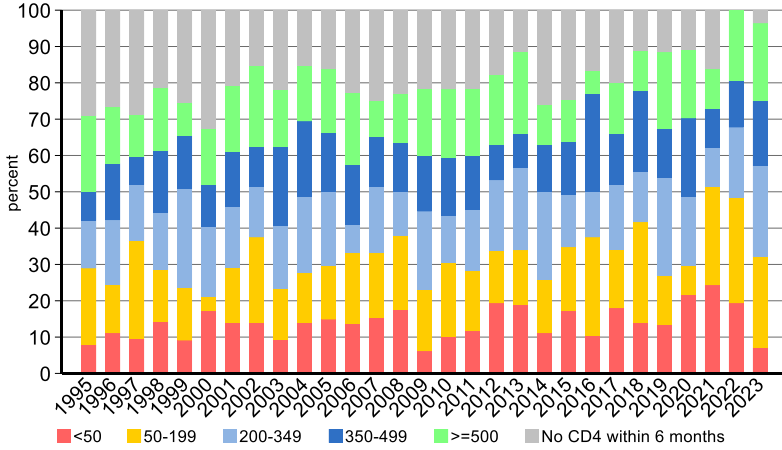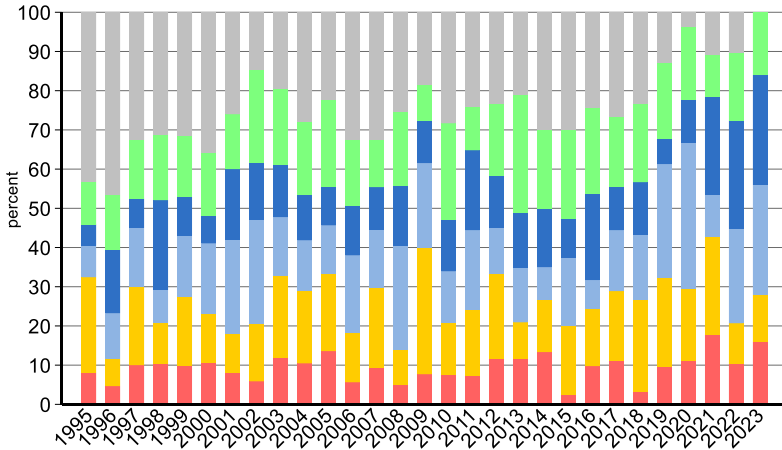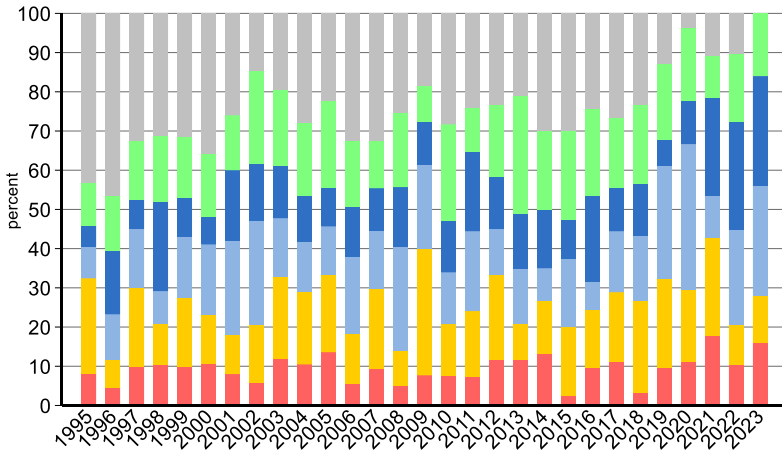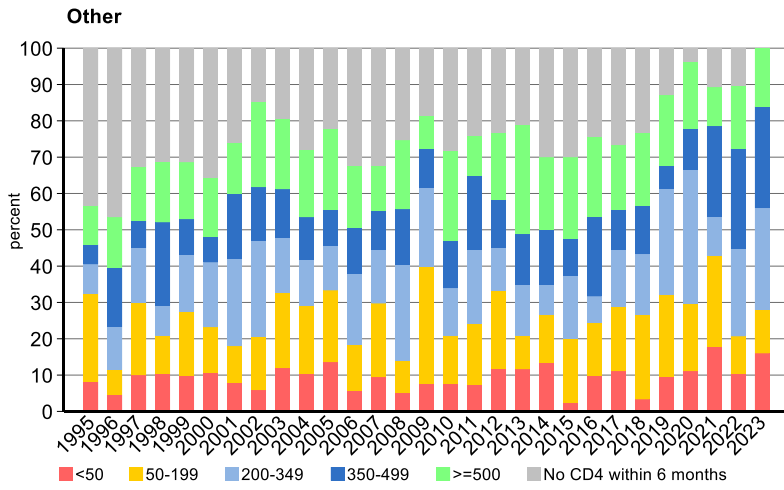### 6.1.2 Factors associated with an „early" diagnosis in patients diagnosed since 2001

"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	1201	7271	16.52%	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	485	2498	19.42%	1.81	[1.45,2.26]	<0.001	1.80	[1.42,2.29]	<0.001
30-50 years	605	3826	15.81%	1.41	[1.14,1.76]	0.002	1.35	[1.08,1.69]	0.009
≥ 50	111	947	11.72%	1.00		.	1.00		.
HIV transmission category									
Male IDU	142	767	18.51%	0.78	[0.64,0.95]	0.014	0.76	[0.62,0.94]	0.011
Female IDU	67	245	27.35%	1.29	[0.96,1.73]	0.088	1.09	[0.80,1.44]	0.580
Male heterosexual	121	1323	9.15%	0.35	[0.28,0.42]	<0.001	0.40	[0.32,0.49]	<0.001
Female heterosexual	114	1210	9.42%	0.36	[0.29,0.44]	<0.001	0.42	[0.33,0.52]	<0.001
Other	21	467	4.50%	0.16	[0.10,0.25]	<0.001	0.19	[0.12,0.30]	<0.001
MSM	736	3259	22.58%	1.00		.	1.00		.
Federal state									
Carinthia	29	309	9.39%	0.59	[0.40,0.87]	0.009			
Upper Austria	123	686	17.93%	1.24	[1.00,1.55]	0.052			
Salzburg	92	398	23.12%	1.71	[1.33,2.20]	0.000			
Styria	95	644	14.75%	0.98	[0.77,1.25]	0.899			
Tyrol	150	504	29.76%	2.41	[1.94,2.99]	0.000			
Other federal states	185	1017	18.19%	1.27	[1.05,1.53]	0.014			
Missing	0	5	0.00%	1.00	[1.00,1.00]	.			
Foreign countries	76	691	11.00%	0.70	[0.54,0.91]	0.008			
Vienna	451	3017	14.95%	1.00		.			
Population size of area of residence									
Missing value	7	102	6.86%	0.44	[0.20,0.94]	0.035	0.66	[0.30,1.46]	0.307
< 100 000	535	2941	18.19%	1.31	[1.15,1.50]	<0.001	1.62	[1.40,1.87]	<0.001
≥ 100 000	189	983	19.23%	1.41	[1.17,1.69]	<0.001	1.79	[1.47,2.19]	<0.001
> 1 million	470	3245	14.48%	1.00		.	1.00		.
Nationality									
Missing value	5	45	11.11%	0.49	[0.19,1.24]	0.130	0.55	[0.21,1.42]	0.227
Low prevalence countries	219	1859	11.78%	0.52	[0.44,0.61]	<0.001	0.52	[0.44,0.62]	<0.001
High prevalence countries	40	784	5.10%	0.21	[0.15,0.29]	<0.001	0.30	[0.21,0.43]	<0.001
Austria	937	4583	20.45%	1.00		.	1.00		.
Calendar period of HIV test									
2005-2008	260	1534	16.95%	0.98	[0.81,1.19]	0.858	0.96	[0.78,1.18]	0.713
2009-2012	297	1506	19.72%	1.18	[0.98,1.43]	0.087	1.07	[0.88,1.31]	0.492
2013-2016	200	1304	15.34%	0.87	[0.71,1.07]	0.197	0.78	[0.63,0.97]	0.026
≥ 2017	219	1619	13.53%	0.75	[0.62,0.92]	0.006	0.66	[0.53,0.88]	<0.001
2001-2004	225	1308	17.20%	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	3073	7271	42.26%	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	772	2498	30.90%	0.31	[0.27,0.37]	<0.001	0.32	[0.27,0.38]	<0.001
30-50 years	1744	3826	45.58%	0.59	[0.51,0.68]	<0.001	0.61	[0.52,0.71]	<0.001
≥ 50	557	947	58.82%	1.00		.	1.00		.
HIV transmission category									
Male IDU	316	767	41.20%	1.38	[1.18,1.62]	<0.001	1.52	[1.28,1.79]	<0.001
Female IDU	66	245	26.94%	0.73	[0.54,0.97]	0.032	0.90	[0.67,1.22]	0.508
Male heterosexual	747	1323	56.46%	2.56	[2.24,2.91]	<0.001	2.04	[1.77,2.34]	<0.001
Female heterosexual	620	1210	51.24%	2.07	[1.81,2.37]	<0.001	1.89	[1.63,2.19]	<0.001
Other	227	467	48.61%	1.86	[1.53,2.27]	<0.001	1.71	[1.39,2.10]	<0.001
MSM	1097	3259	33.66%	1.00		.	1.00		.
Federal state									
Carinthia	142	309	45.95%	1.22	[0.96,1.54]	0.104			
Upper Austria	313	686	45.63%	1.20	[1.01,1.42]	0.033			
Salzburg	163	398	40.95%	0.99	[0.80,1.23]	0.936			
Styria	287	644	44.57%	1.15	[0.97,1.36]	0.113			
Tyrol	194	504	38.49%	0.89	[0.74,1.09]	0.258			
Other federal states	457	1017	44.94%	1.17	[1.01,1.35]	0.035			
Missing	2	5	40.00%	0.95	[0.16,5.71]	0.958			
Foreign countries	273	691	39.51%	0.93	[0.79,1.11]	0.424			
Vienna	1242	3017	41.17%	1.00		.			
Population size of area of residence									
Missing value	32	102	31.37%	0.66	[0.43,1.00]	0.053	0.58	[0.37,0.90]	0.016
< 100 000	1302	2941	44.27%	1.14	[1.03,1.26]	0.010	1.00	[0.90,1.12]	0.943
≥ 100 000	408	983	41.51%	1.02	[0.88,1.18]	0.785	0.91	[0.78,1.06]	0.228
> 1 million	1331	3245	41.02%	1.00		.	1.00		.
Nationality									
Missing/Unknown	10	45	22.22%	0.41	[0.20,0.83]	0.013	0.43	[0.21,0.90]	0.024
Low prevalence countries	735	1859	39.54%	0.94	[0.84,1.05]	0.251	1.02	[0.91,1.15]	0.687
High prevalence countries	445	784	56.76%	1.88	[1.62,2.19]	<0.001	1.63	[1.37,1.94]	<0.001
Austria	1883	4583	41.09%	1.00		.	1.00		.
Calendar period of HIV test									
2005-2008	665	1534	43.35%	1.02	[0.88,1.18]	0.805	1.03	[0.88,1.20]	0.733
2009-2012	617	1506	40.97%	0.92	[0.80,1.07]	0.303	0.97	[0.83,1.14]	0.709
2013-2016	525	1304	40.26%	0.90	[0.77,1.05]	0.173	0.94	[0.79,1.10]	0.431
≥ 2017	705	1619	43.55%	1.03	[0.89,1.19]	0.722	1.03	[0.88,1.20]	0.727
2001-2004	561	1308	42.89%	1.00		.	1.00		.

7   Antiretroviral therapy (ART)

7.1   Patients currently in care regarding treatment status

Overall, 4810 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 March 1st, 2024 4763 (99.0%) patients were on antiretroviral therapy in the 9 HIV treatment centres. Of the 47 patients not on treatment on March 1st, 2024, 17 had received antiretroviral treatment at an earlier point in time.
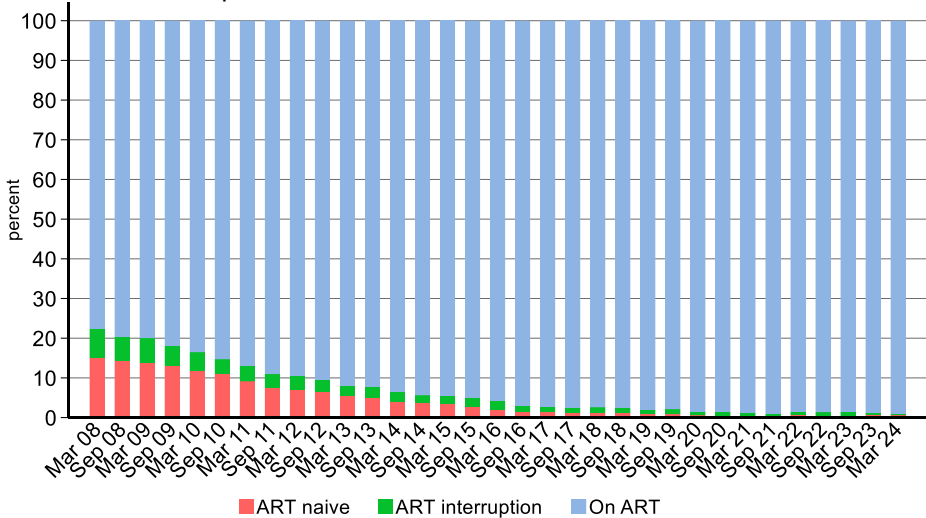
7.2   Regimens of antiretroviral therapy

Use of therapy regimens over time
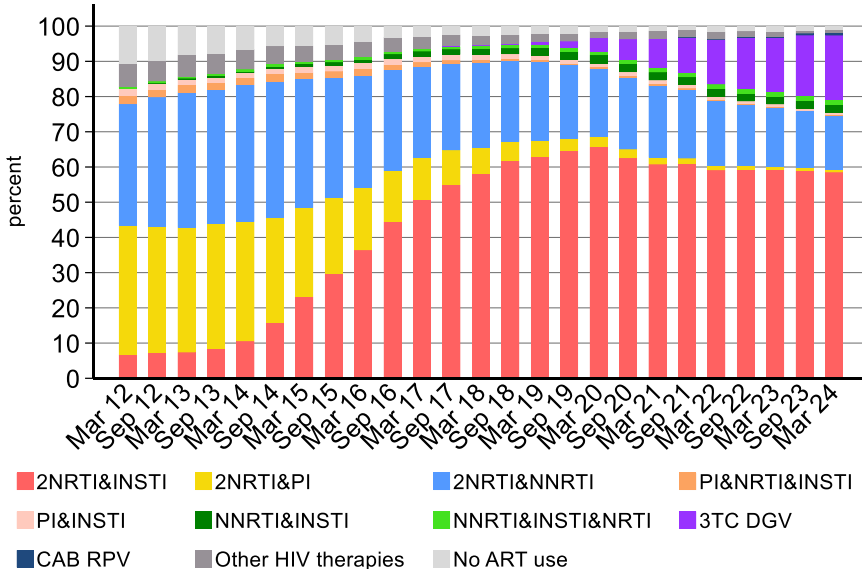
Proportion of therapy regimens on March 1st 2024
(absolut numbers given in parantheses)
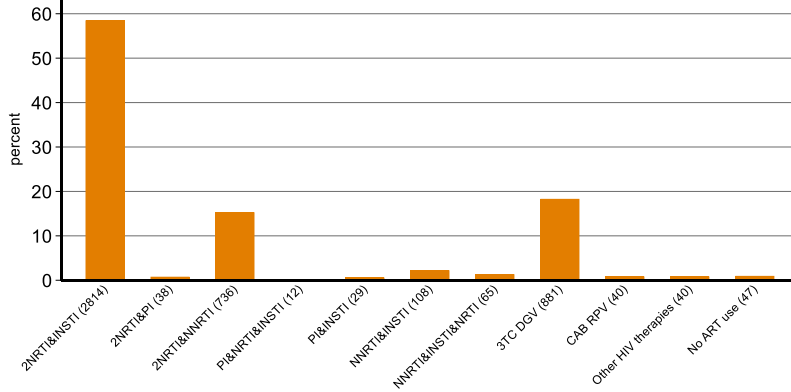
Therapy regimens in the patients currently in care

Legend:
- 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
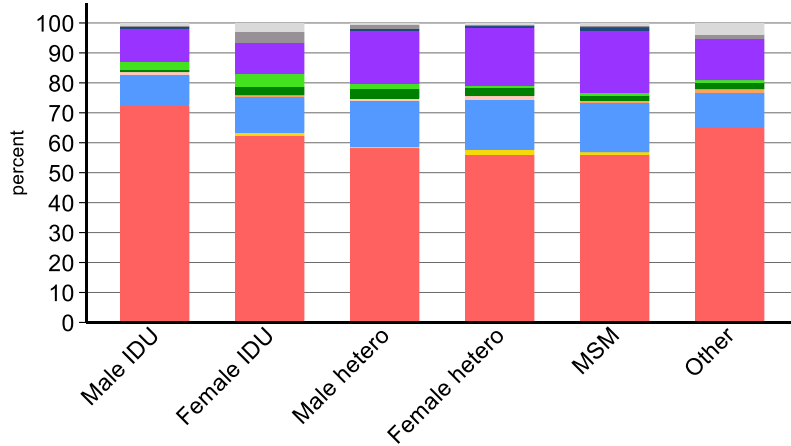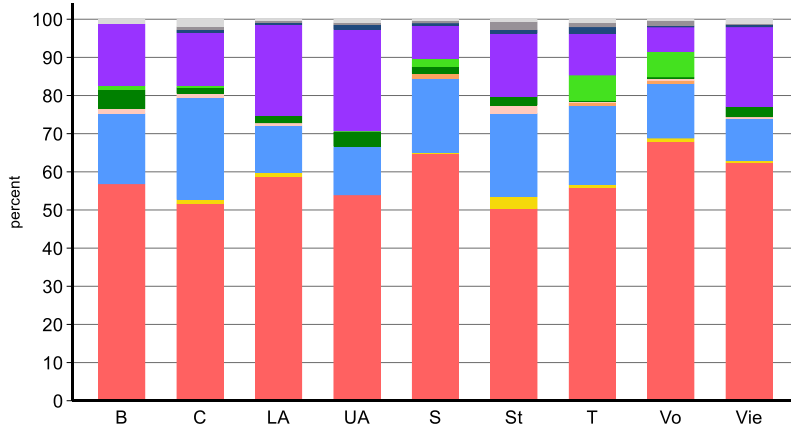
7.3   CD4 cell counts at initiation of ART

7.3.1   CD4 cell counts at initiation of ART

Median CD4 cell count-last measurement before ART start
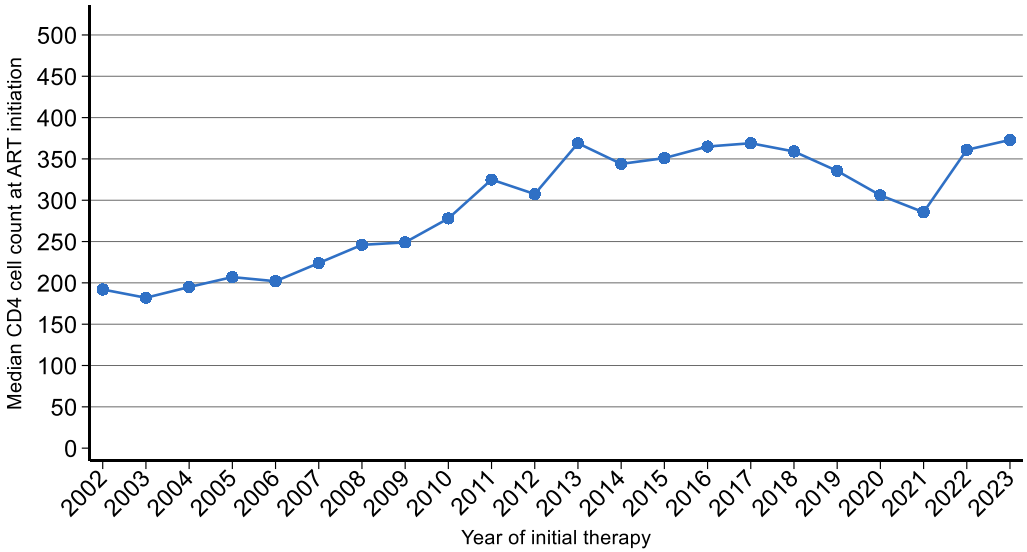
7.3.2   Median CD4 count at ART initiation

Transmission category
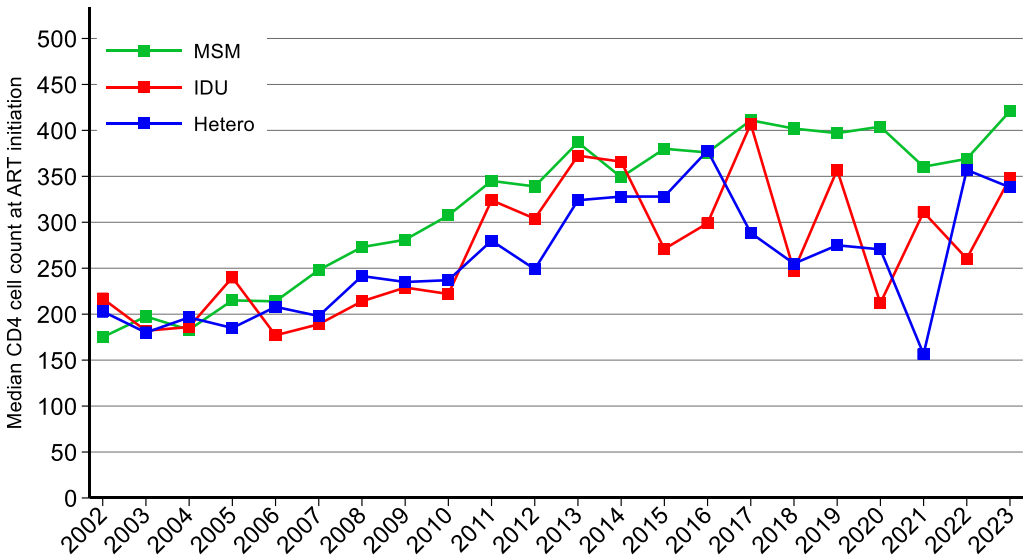
Level of education
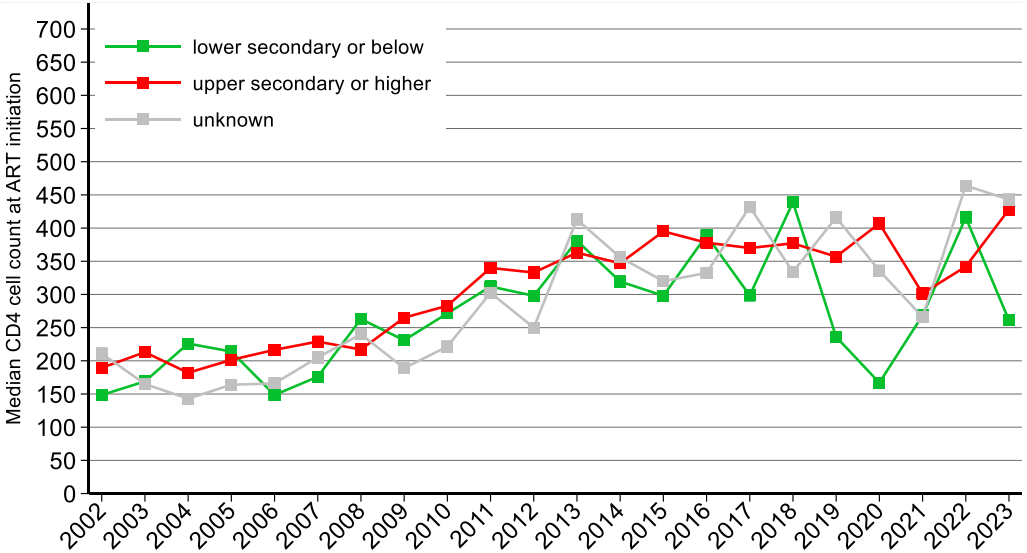
Status of employment
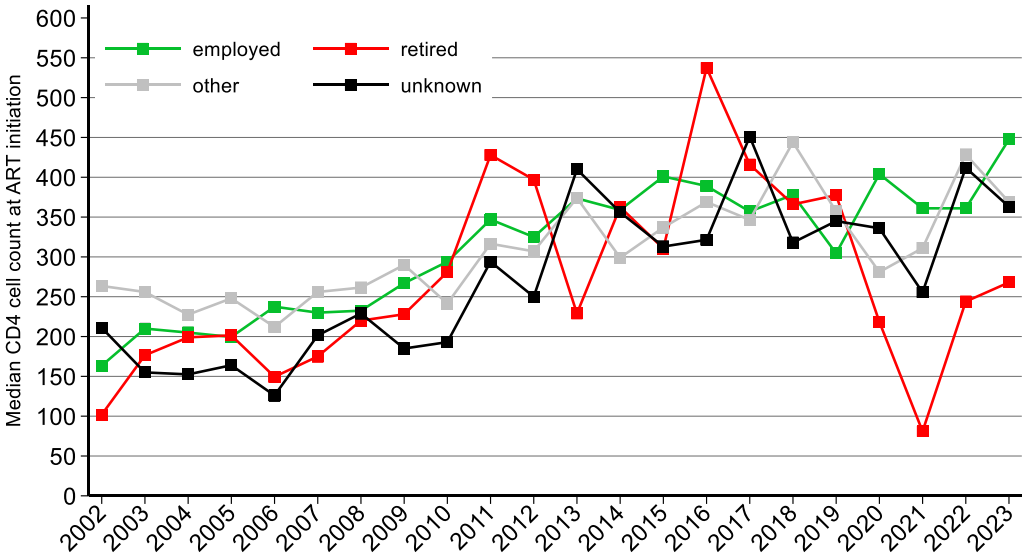
7.4 Initial therapy

7.4.1 Number of persons who started ART in the respective year
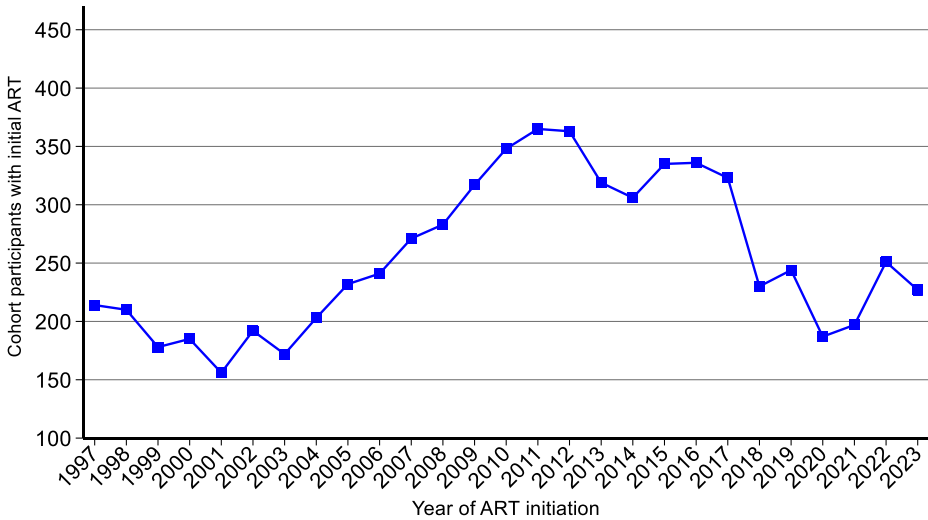
7.4.2 Regimens of the initial therapy

After September 1st, 2023, 119 patients started antiretroviral therapy. 105 of them also had their first measurement of CD4 cell count within this period.

Initial therapy by transmission category and sex

Legend: 2NRTI&INSTI ■ 2NRTI&NNRTI ■ 3TC DGV ■ Other HIV therapies

X-axis categories: Male IDU, Female IDU, Male hetero, Female hetero, MSM, Other

Y-axis: percent (0–100)
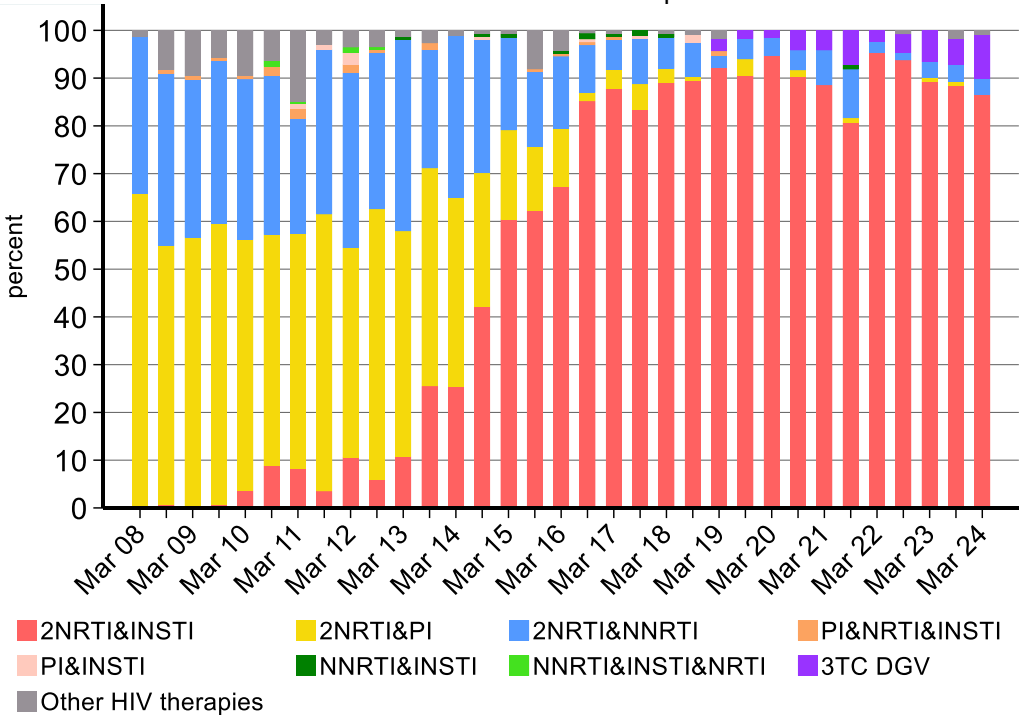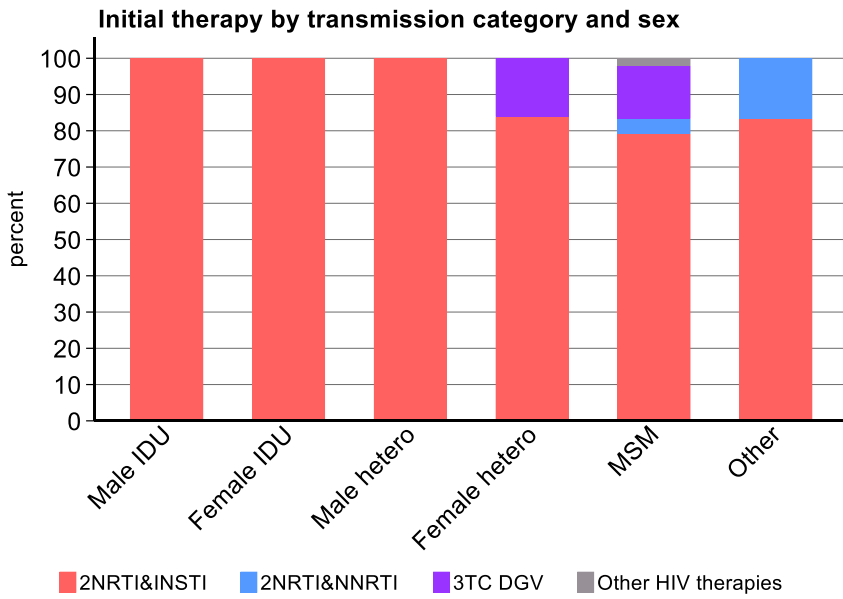
7.5 ART switches and interruptions

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	35.7	18.9
2006	23.0	13.5
2007	28.7	13.6
2008	25.8	13.9
2009	30.6	9.3
2010	21.5	7.3
2011	24.1	7.6
2012	26.6	6.0
2013	21.3	6.4
2014	24.7	7.1
2015	23.0	5.7
2016	23.1	3.8
2017	13.9	3.0
2018	24.4	2.9
2019	22.8	0.4
2020	17.2	3.1
2021	18.8	2.9
2022	11.2	2.3
2023	8.6	0.4
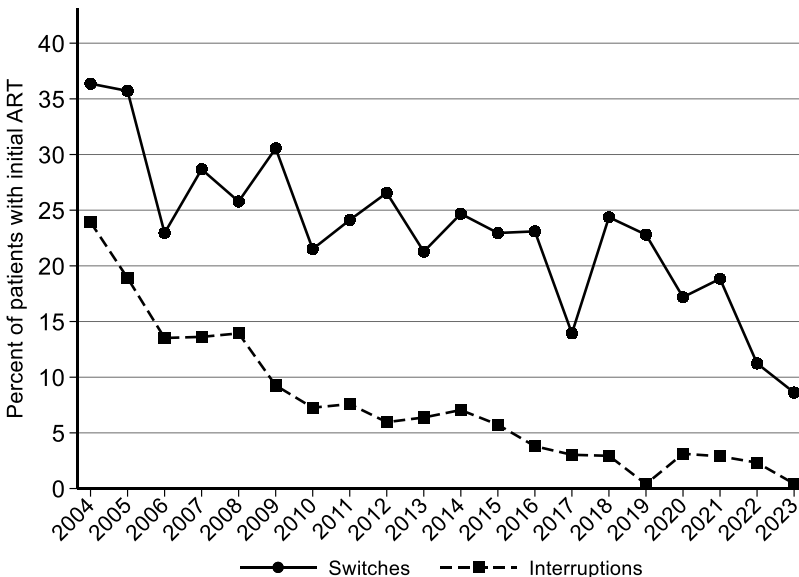
7.5.2 ART switches and interruptions per calendar year

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	28.3	8.8
2005	27.8	10.9
2006	24.5	7.3
2007	21.9	6.0
2008	22.7	5.3
2009	19.4	5.2
2010	20.0	4.1
2011	16.9	4.0
2012	18.0	3.9
2013	15.7	3.0
2014	21.5	3.1
2015	22.1	2.9
2016	23.5	2.4
2017	18.1	2.2
2018	13.5	1.7
2019	19.9	1.5
2020	17.7	1.4
2021	15.2	0.8
2022	17.6	0.8
2023	11.5	0.7
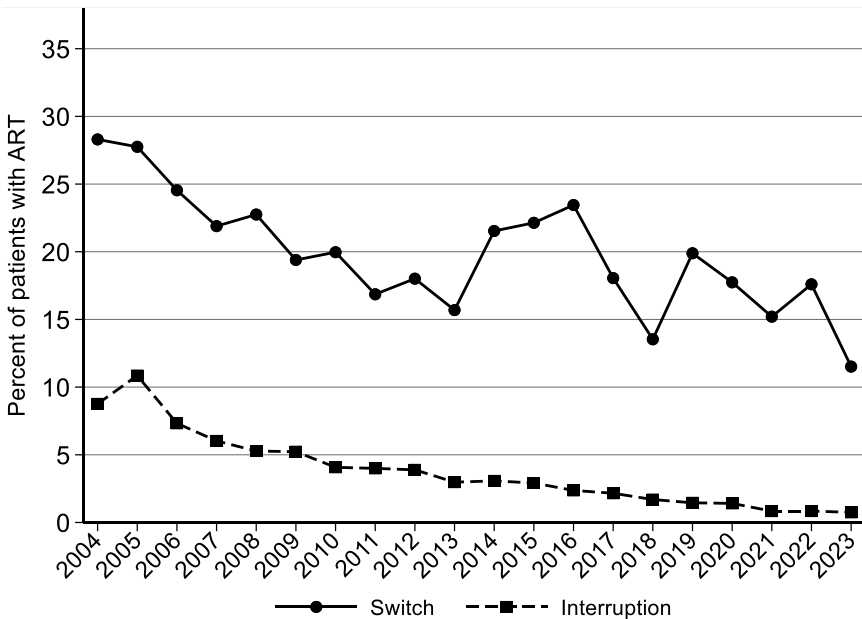
7.5.3 Risk factors for treatment switches during the first year of treatment, excluding switches from TDF to TAF containing regimens

10 Transgender persons were excluded from these analyses

	Switch	All		Univariable logistic regression			Multivariable logistic regression		
	1323	5723	23.12%	OR	[95% CI]	p value	OR	[95% CI]	p value
HIV transmission category									
Male IDU	131	612	21.41%	1.04	[0.84,1.29]	0.719	0.92	[0.74,1.15]	0.480
Female IDU	42	216	19.44%	0.92	[0.65,1.31]	0.649	0.84	[0.59,1.20]	0.341
Male heterosexual	233	1044	22.32%	1.10	[0.92,1.31]	0.295	0.91	[0.76,1.10]	0.333
Female heterosexual	300	962	31.19%	1.73	[1.47,2.04]	<0.001	1.57	[1.32,1.86]	<0.001
Other	79	296	26.69%	1.39	[1.06,1.83]	0.019	1.32	[0.99,1.75]	0.057
MSM	538	2593	20.75%	1.00		.	1.00		.
Age at baseline									
< 30 years	305	1400	21.79%	0.81	[0.66,0.98]	0.027	0.81	[0.66,0.99]	0.037
30-50 years	771	3362	22.93%	0.86	[0.73,1.02]	0.075	0.83	[0.70,0.99]	0.035
≥ 50	247	961	25.70%	1.00		.	1.00		.
AIDS at baseline									
Yes	293	859	34.11%	1.93	[1.65,2.25]	<0.001			
No	1030	4864	21.18%	1.00		.			
CD4 count at baseline									
< 50	209	648	32.25%	2.12	[1.74,2.59]	<0.001	1.96	[1.59,2.41]	<0.001
50-199	303	1100	27.55%	1.70	[1.43,2.02]	<0.001	1.51	[1.26,1.82]	<0.001
200-349	311	1445	21.52%	1.22	[1.03,1.45]	0.019	1.09	[0.91,1.29]	0.363
Missing	127	493	25.76%	1.55	[1.23,1.95]	<0.001	1.61	[1.27,2.04]	<0.001
≥ 350	373	2037	18.31%	1.00		.	1.00		.
HIV-RNA at baseline									
10.000-99.999	385	1960	19.64%	0.90	[0.74,1.08]	0.265			
≥ 100.000	534	2036	26.23%	1.31	[1.09,1.57]	0.004			
Missing	191	731	26.13%	1.30	[1.04,1.63]	0.022			
≤ 9.999	213	996	21.39%	1.00		.			
Nationality									
High prevalence countries	201	715	28.11%	1.35	[1.14,1.62]	0.001			
Low prevalence countries	1122	5008	22.40%	1.00		.			
Population size of area of residence									
Rural areas	542	2332	23.24%	1.10	[0.96,1.26]	0.164	1.13	[0.98,1.30]	0.095
Capital cities	218	783	27.84%	1.40	[1.17,1.68]	<0.001	1.48	[1.23,1.79]	<0.001
Vienna	563	2608	21.59%	1.00		.	1.00		.
Year of ART Initiation									
2004-2007	297	969	30.65%	2.80	[2.21,3.55]	<0.001	2.79	[2.19,3.57]	<0.001
2008-2011	339	1336	25.37%	2.16	[1.72,2.71]	<0.001	2.36	[1.87,2.98]	<0.001
2012-2015	328	1375	23.85%	1.99	[1.58,2.50]	<0.001	2.19	[1.74,2.77]	<0.001
2016-2019	238	1155	20.61%	1.65	[1.30,2.09]	<0.001	1.79	[1.41,2.28]	<0.001
2020-2023	121	888	13.63%	1.00		.	1.00		.

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

10 Transgender persons were excluded from these analyses

	TI	All		Univariable logistic regression			Multivariable logistic regression		
	425	5723	7.43%	OR	[95% CI]	p value	OR	[95% CI]	p value
HIV transmission category									
Male IDU	90	612	14.71%	4.74	[3.49,6.44]	<0.001	3.39	[2.46,4.67]	<0.001
Female IDU	53	216	24.54%	8.94	[6.15,12.99]	<0.001	6.27	[4.22,9.32]	<0.001
Male heterosexual	73	1044	6.99%	2.07	[1.51,2.84]	<0.001	1.68	[1.20,2.37]	0.003
Female heterosexual	105	962	10.91%	3.37	[2.52,4.51]	<0.001	2.31	[1.66,3.21]	<0.001
Other	13	296	4.39%	1.26	[0.70,2.29]	0.441	1.26	[0.68,2.32]	0.464
MSM	91	2593	3.51%	1.00		.	1.00		.
Age at baseline									
< 30 years	168	1400	12.00%	2.65	[1.90,3.71]	<0.001	1.79	[1.25,2.58]	0.002
30-50 years	210	3362	6.25%	1.30	[0.94,1.79]	0.118	0.97	[0.69,1.37]	0.866
≥ 50	47	961	4.89%	1.00		.	1.00		.
AIDS at baseline									
Yes	69	859	8.03%	1.11	[0.85,1.45]	0.462			
No	356	4864	7.32%	1.00		.			
CD4 count at baseline									
< 50	49	648	7.56%	1.11	[0.79,1.55]	0.551			
50-199	85	1100	7.73%	1.13	[0.86,1.50]	0.376			
200-349	116	1445	8.03%	1.18	[0.92,1.53]	0.199			
Missing	35	493	7.10%	1.04	[0.71,1.52]	0.859			
≥ 350	140	2037	6.87%	1.00		.			
HIV-RNA at baseline									
10.000-99.999	145	1960	7.40%	0.87	[0.66,1.15]	0.320			
≥ 100.000	140	2036	6.88%	0.80	[0.60,1.06]	0.124			
Missing	56	731	7.66%	0.90	[0.63,1.28]	0.561			
≤ 9.999	84	996	8.43%	1.00		.			
Nationality									
High prevalence countries	88	715	12.31%	1.95	[1.52,2.50]	<0.001	1.37	[1.02,1.86]	0.039
Low prevalence countries	337	5008	6.73%	1.00		.	1.00		.
Population size of area of residence									
Rural areas	135	2332	5.79%	0.67	[0.54,0.84]	<0.001	0.92	[0.72,1.16]	0.476
Capital cities	71	783	9.07%	1.09	[0.82,1.44]	0.556	1.44	[1.06,1.94]	0.018
Vienna	219	2608	8.40%	1.00		.	1.00		.
Year of ART Initiation									
2004-2007	166	969	17.13%	9.45	[5.83,15.35]	<0.001	6.83	[4.18,11.18]	<0.001
2008-2011	124	1336	9.28%	4.68	[2.86,7.64]	<0.001	3.65	[2.22,6.02]	<0.001
2012-2015	85	1375	6.18%	3.01	[1.82,4.99]	<0.001	2.67	[1.60,4.44]	<0.001
2016-2019	31	1155	2.68%	1.26	[0.71,2.25]	0.431	1.25	[0.70,2.23]	0.460
2020-2023	19	888	2.14%	1.00		.	1.00		.

7.7 Frequency of drug dosing

7.7.1 Overview

22 of 4810 (0.5%) patients do not take any drugs at all and 25 (0.5%) patients have no ART but take other drugs. 734 (15.3%) patients are receiving ART only.

Dosing frequency	Number of patients					
	0	1	2	3	4	Total
Antiretrovirals (ARVs)	47	4639	123	1	0	4810
Drugs other than ARVs	756	1663	1294	758	339	4810
Overall dosing frequency	22	1666	1795	935	392	4810
Overall dosing frequency in patients with once daily ARVs	0	1656	1721	891	371	4639
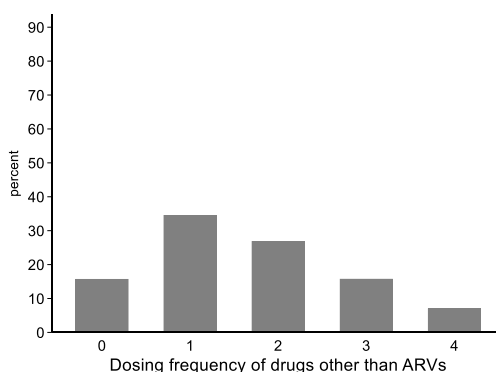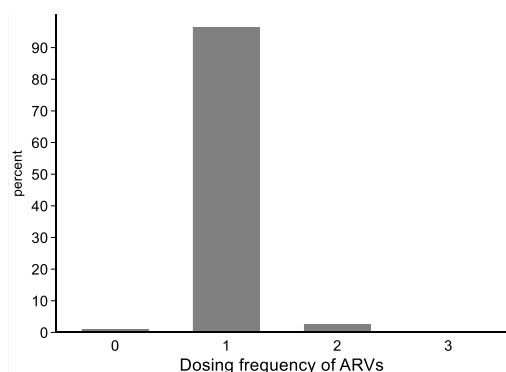
7.7.2 Most frequent regimen on March 1st 2024

Regimen	Frequency	Percent
BGV FTC TAF	2,085	43.77
3TC DGV	881	18.5
3TC ABC DGV	322	6.76
FTC RPV TAF	294	6.17
3TC DOR TDF	255	5.35
DGV FTC TDF	101	2.12
EVG FTC TAF	87	1.83
3TC ABC RAL	67	1.41
DGV FTC TAF	65	1.36
DGV RPV	56	1.18
FTC RAL TDF	50	1.05
3TC ABC NVP	49	1.03
CAB RPV	40	0.84
DGV DOR	40	0.84
FTC RPV TDF	38	0.8
EFV FTC TDF	33	0.69
3TC DGV DOR	31	0.65
FTC RAL TAF	30	0.63
FTC NVP TDF	18	0.38
FTC NVP TAF	17	0.36
DGV DRV RTVb	15	0.31
Other	189	3.88
Total	**4763**	**100.00**

7.8 Use of antiretroviral drugs to prevent HIV infection

PEP

	Non-occupational PEP started in								
	2016	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**
Sex									
Women	37	40	63	65	44	45	42	79	15
Men	107	134	160	263	149	180	189	210	37
Age (years)									
<30	64	97	114	164	103	126	118	150	26
30-48	72	72	102	150	83	94	107	123	22
≥50	8	5	7	14	7	5	6	16	4
Area of residence									
Vienna	74	101	126	192	108	120	129	156	24
Lower Austria	4	6	10	13	21	13	17	28	5
Burgenland	1	0	1	4	3	2	2	3	0
Upper Austria	3	15	17	25	11	32	21	25	6
Salzburg	0	7	8	11	3	3	8	3	1
Tyrol	22	11	23	29	28	29	18	34	6
Vorarlberg	2	1	2	3	3	3	9	11	0
Styria	10	6	14	17	8	10	17	19	4
Carinthia	0	0	1	1	0	0	0	1	0
Missing/Foreign	28	27	21	33	8	13	10	9	6

PrEP

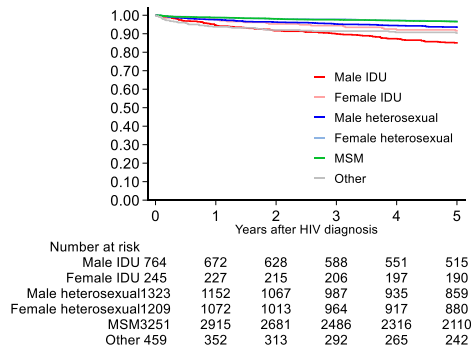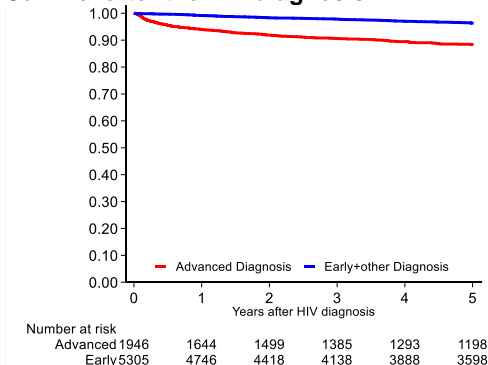|	PrEP started in									On PrEP at 01.03.2024
	2016	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	
Sex										
Women	0	1	3	9	5	2	4	12	2	30
Men	6	101	199	288	211	305	423	484	73	1652
Age (years)										
<30	3	32	52	83	63	113	175	179	26	553
30-48	3	64	124	188	132	158	204	282	42	963
≥50	0	6	26	26	21	36	48	35	7	166
Area of residence										
Vienna	1	80	83	132	65	87	104	152	22	602
Lower Austria	0	6	9	12	10	9	14	26	3	81
Burgenland	0	0	0	3	1	3	2	2	0	11
Upper Austria	0	0	21	28	33	51	71	90	16	285
Salzburg	0	1	5	7	3	5	24	23	1	61
Tyrol	4	12	60	89	70	120	155	145	23	418
Vorarlberg	1	1	19	12	18	22	32	30	6	123
Styria	0	1	4	10	14	8	20	26	3	83
Carinthia	0	0	0	0	1	1	1	0	0	3
Missing/Foreign	0	1	1	4	1	1	4	2	1	15

8 Disease progression and Response to ART

8.1 Factors associated with mortality in patients diagnosed since 2001

Date of censoring: last contact with the HIV centre (31 missing)

All centres	820	7271	11.28%	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	210	2498	8.41%	0.26	[0.22,0.31]	<0.001	0.19	[0.15,0.24]	<0.001
30-50 years	379	3826	9.91%	0.33	[0.28,0.38]	<0.001	0.29	[0.24,0.34]	<0.001
≥ 50	231	947	24.39%	1.00		.	1.00		.
HIV transmission category									
Male IDU	229	767	29.86%	3.78	[3.14,4.56]	<0.001	4.14	[3.40,5.04]	<0.001
Female IDU	69	245	28.16%	3.16	[2.41,4.15]	<0.001	3.71	[2.78,4.94]	<0.001
Male heterosexual	175	1323	13.23%	1.74	[1.43,2.13]	<0.001	1.19	[0.97,1.47]	0.094
Female heterosexual	74	1210	6.12%	0.73	[0.56,0.95]	0.019	0.74	[0.56,0.98]	0.034
Other	57	467	12.21%	2.13	[1.59,2.85]	<0.001	1.81	[1.34,2.44]	<0.001
MSM	216	3259	6.63%	1.00		.	1.00		.
Population size of area of residence									
Missing value	6	102	5.88%	0.80	[0.36,1.80]	0.595	1.09	[0.48,2.50]	0.832
< 100 000	257	2941	8.74%	0.59	[0.51,0.69]	<0.001	0.65	[0.55,0.76]	<0.001
≥ 100 000	89	983	9.05%	0.60	[0.48,0.75]	<0.001	0.77	[0.61,0.97]	0.026
> 1 million	468	3245	14.42%	1.00		.	1.00		.
Nationality									
Missing/Unknown	4	45	8.89%	0.87	[0.32,2.32]	0.778	1.15	[0.42,3.15]	0.784
Low prevalence countries	98	1859	5.27%	0.45	[0.36,0.55]	<0.001	0.60	[0.48,0.74]	<0.001
High prevalence countries	47	784	5.99%	0.41	[0.31,0.56]	<0.001	0.68	[0.49,0.93]	0.016
Austria	671	4583	14.64%	1.00		.	1.00		.
Stage of disease									
Advanced diagnosis									
Yes	349	1947	17.93%	2.16	[1.88,2.48]	<0.001	1.98	[1.71,2.28]	<0.001
No	471	5324	8.85%	1.00		.	1.00		.
Calendar period of HIV test									
2005-2008	228	1534	14.86%	0.76	[0.64,0.91]	0.003	0.85	[0.71,1.01]	0.76
2009-2012	158	1506	10.49%	0.70	[0.57,0.86]	0.001	0.79	[0.64,0.96]	0.70
2013-2016	80	1304	6.13%	0.57	[0.44,0.74]	<0.001	0.66	[0.51,0.86]	0.57
≥ 2017	46	1619	2.84%	0.76	[0.64,0.91]	0.003	0.85	[0.71,1.01]	0.76
2001-2004	308	1308	23.55%	1.00		.	1.00		.

Survival after the HIV diagnosis

Number at risk

	0	1	2	3	4	5
Advanced	1946	1644	1499	1385	1293	1198
Early	5305	4746	4418	4138	3888	3598

Number at risk

	0	1	2	3	4	5
Male IDU	764	672	628	588	551	515
Female IDU	245	227	215	206	197	190
Male heterosexual	1323	1152	1067	987	935	859
Female heterosexual	1209	1072	1013	964	917	880
MSM	3251	2915	2681	2486	2316	2110
Other	459	352	313	292	265	242

8.2 HIV RNA (viral load)

8.2.1 Last HIV RNA currently in care regardless of ART

94.8% of the patients currently in care (4829 of 5094) have a current HIV RNA below 400 copies/ml.

Last HIV RNA Measurement

Legend: <=50, 51-199, 200-999, >=1000, No information

Proportion of patients with HIV RNA =50 <200 and <1000 in different periods

Legend: <=50 copies/ml, <200 copies/ml, <1000 copies/ml
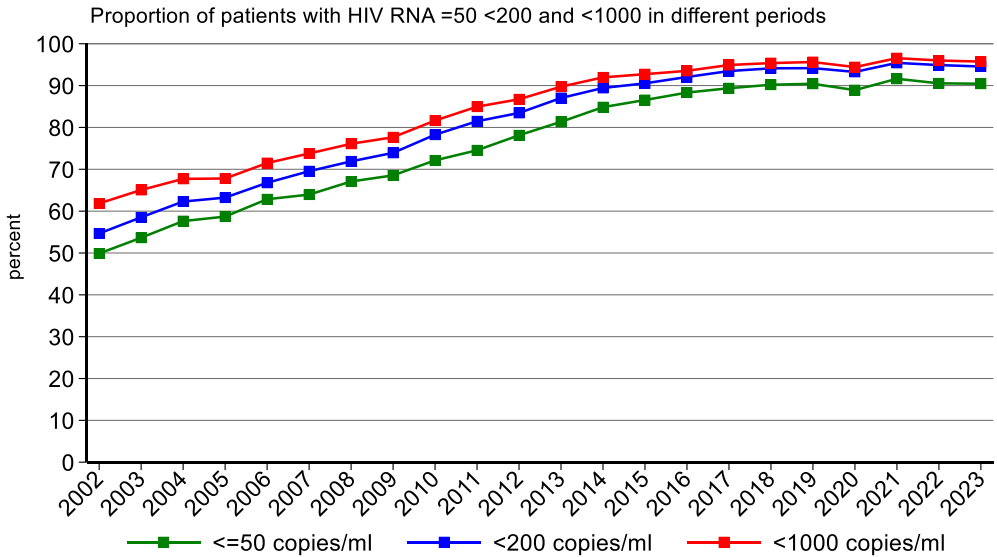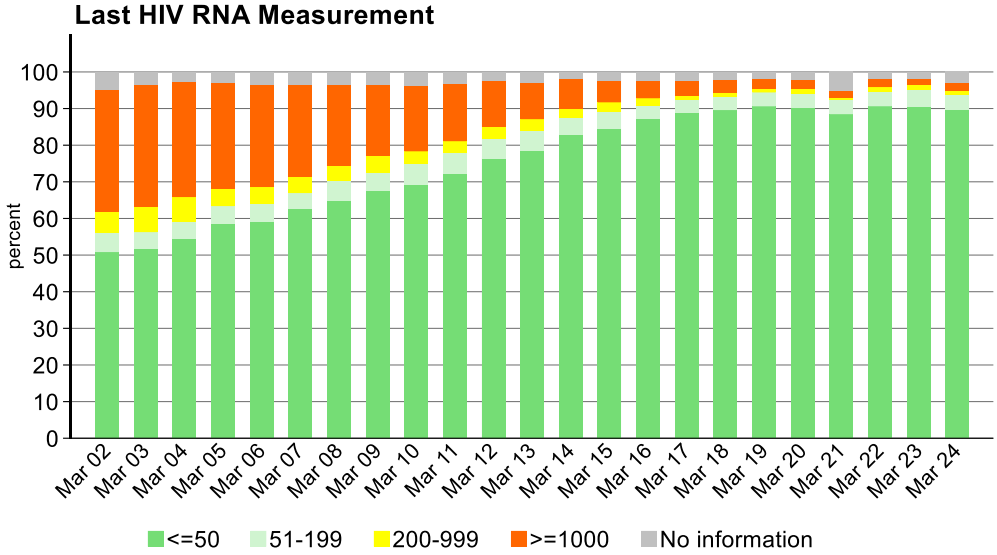
RNA-measurement and visit in the last 12 months

Chart 1: Bar chart showing percent on the y-axis (0 to 100) for categories B, C, LA, UA, S, St, T, Vo, Vie. Legend: <=50, 51-199, 200-999, >=1000, No Information.

Chart 2: Bar chart showing percent on the y-axis (0 to 100) for categories MSM, IDU, Hetero, Other. Legend: <=50, 51-199, 200-999, >=1000, No Information.
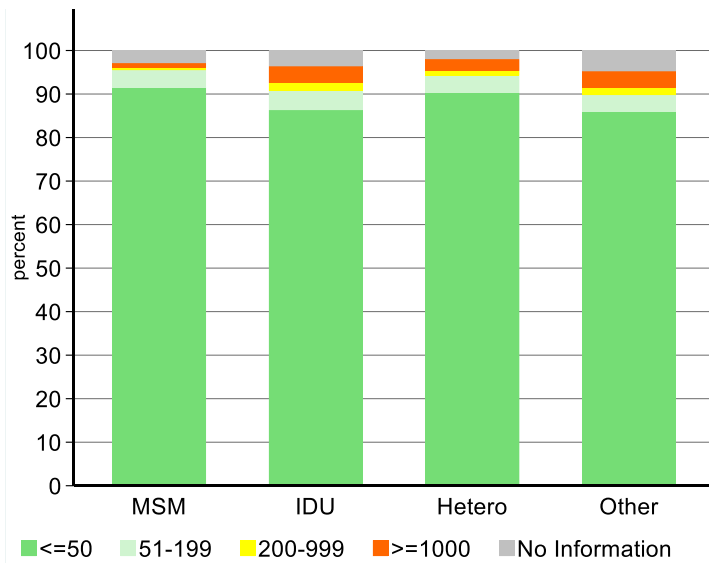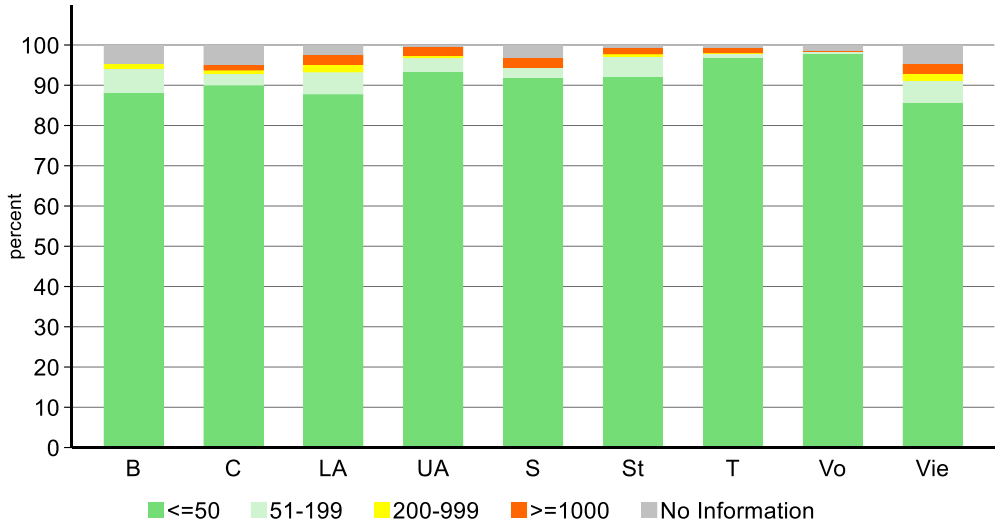
8.2.2   The continuum of care in Austria

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 2022.

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 [low, high estimate]	(e) Suppressed of all PLHIV
2010	6254	**84%** [80%,86%]	**83%** [76%,89%]	**79%** [71%,86%]	**55%**
2011	6432	**86%** [82%,88%]	**85%** [79%,91%]	**80%** [72%,88%]	**59%**
2012	6594	**88%** [84%,90%]	**87%** [81%,93%]	**81%** [73%,89%]	**62%**
2013	6734	**89%** [85%,91%]	**89%** [83%,94%]	**83%** [74%,91%]	**66%**
2014	6864	**90%** [86%,92%]	**91%** [85%,96%]	**84%** [75%,92%]	**69%**
2015	6975	**91%** [88%,94%]	**92%** [87%,97%]	**84%** [75%,93%]	**70%**
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%**
2021	7732	**97%** [94%,100%]	**96%** [92%,99%]	**89%** [69%,96%]	**82%**
2022	7596	**96%** [93%, 99%]	**96%** [93%, 99%]	**89%** [70%, 95%]	**82%**

We conclude that Austria has finally reached the 90-90-90 target of UNAIDS for 2020. The somewhat smaller estimate of viral suppression may be explained substantially by transfer of care in Vienna and out-migration. This and the decrease in HIV incidence support 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 might be included.
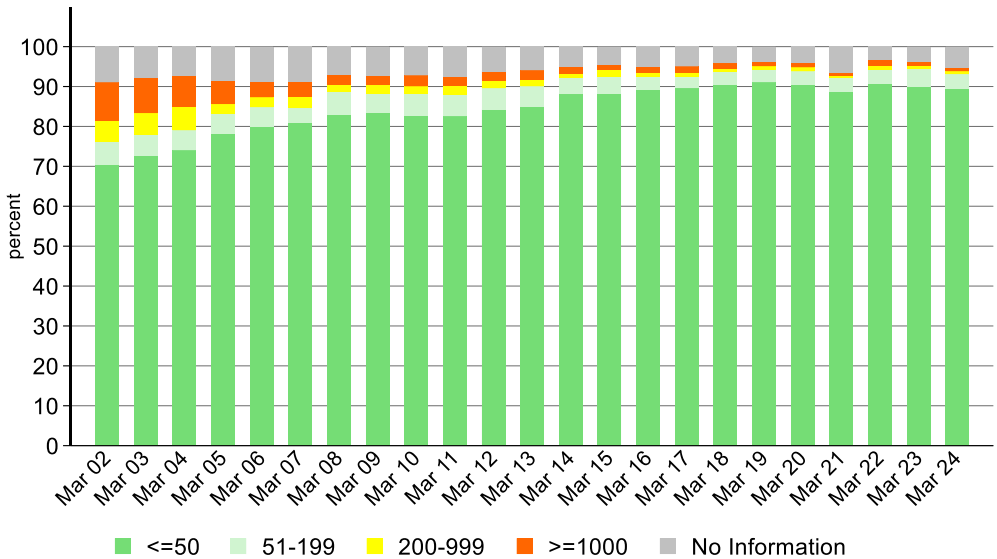
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8.2.3   Last HIV RNA on ART

Patients were included if there were at least 75 days between ART initiation and HIV RNA measurement.
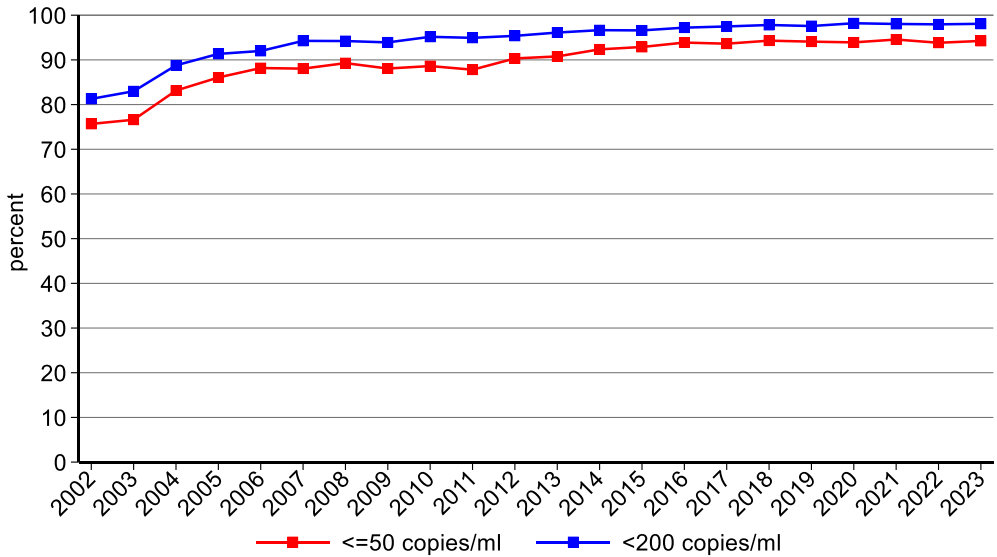
8.2.3.1   Last HIV RNA on ART at different points in time

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

8.2.4   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.

	102	4914	2.08%	Univariable logistic regression			Multivariable logistic regression		
				OR	[95% CI]	p value	OR	[95% CI]	p value
Age									
< 30 years	5	175	2.86%	2.13	[0.82,5.51]	0.119	2.91	[1.03,8.19]	0.044
30-50 years	62	2170	2.86%	2.13	[1.40,3.24]	0.000	2.03	[1.29,3.21]	0.002
≥ 50	35	2569	1.36%	1.00		.	1.00		.
HIV transmission category									
Male IDU	17	398	4.27%	5.02	[2.58,9.74]	<0.001	2.89	[1.44,5.80]	0.003
Female IDU	6	180	3.33%	3.88	[1.53,9.83]	0.004	2.24	[0.85,5.93]	0.105
Male heterosexual	21	917	2.29%	2.63	[1.41,4.92]	0.002	2.40	[1.25,4.64]	0.009
Female heterosexual	30	986	3.04%	3.53	[1.98,6.30]	<0.001	2.18	[1.15,4.11]	0.016
Other	9	278	3.24%	3.76	[1.68,8.40]	0.001	2.49	[1.05,5.93]	0.039
MSM	19	2155	0.88%	1.00		.	1.00		.
Nationality									
Missing/unknown	1	23	4.35%	2.79	[0.37,21.04]	0.320	1.67	[0.21,13.44]	0.629
High prevalence	22	410	5.37%	3.48	[2.10,5.76]	<0.001	1.93	[1.07,3.48]	0.028
Low prevalence	23	991	2.32%	1.46	[0.89,2.38]	0.133	1.45	[0.86,2.45]	0.159
Austria	56	3490	1.60%	1.00		.	1.00		.
Population size of area of residence									
Rural areas	35	2286	1.53%	0.49	[0.32,0.76]	0.001			
Capital cities	12	832	1.44%	0.46	[0.25,0.87]	0.017			
Vienna	55	1796	3.06%	1.00		.			
AIDS									
Yes	14	760	1.84%	0.87	[0.49,1.53]	0.624			
No	88	4154	2.12%	1.00		.			
CD4 Nadir									
<50	22	761	2.89%	1.88	[1.12,3.15]	0.017	1.59	[0.93,2.73]	0.092
50-199	34	1266	2.69%	1.74	[1.11,2.73]	0.016	1.48	[0.91,2.39]	0.112
≥200	45	2884	1.56%	1.00		.	1.00		.
ART initiation									
Before 1.1.1997	5	364	1.37%	0.64	[0.26,1.58]	0.333	0.41	[0.16,1.09]	0.074
After 1.1.1997	97	4550	2.13%	1.00		.	1.00		.
Ever ART interruptions									
None	48	3768	1.27%	0.22	[0.14,0.35]	<0.001	0.19	[0.11,0.33]	<0.001
1	26	643	4.04%	0.71	[0.41,1.24]	0.229	0.72	[0.41,1.26]	0.249
≥2	28	503	5.57%	1.00		.	1.00		.
Art duration									
< 9 months	4	71	5.63%	2.94	[1.05,8.24]	0.040	4.25	[1.43,12.60]	0.009
9-18 months	5	166	3.01%	1.53	[0.61,3.82]	0.361	1.72	[0.60,4.92]	0.315
> 18 months	93	4677	1.99%	1.00		.	1.00		.

9   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

10 Austrian HIV Cohort Study Group

As of May 2024

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Coordinating Centre: Medical University of Innsbruck (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)
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