

Additional File 1, Table 1. Missing cause of death codes by cohort

Cohort	Total Deaths	Number of Deaths with missing Cause of Death Code	Proportion of Deaths with missing Cause of Death Code
Co-RIS	174	17	9.8%
AHIVCOS	294	30	10.2%
SHCS	384	54	14.1%
PISCIS	538	83	15.4%
HOMER	899	186	20.7%
EuroSIDA	210	45	21.4%
Alberta	140	38	27.1%
DHK	294	84	28.6%
ATHENA	1,006	321	31.9%
Vanderbilt	175	60	34.3%
FHDH	1,968	683	34.7%
HAVACS	109	39	35.8%
AQUITAINE	189	76	40.2%
VACS	3,460	1,802	52.1%
Royal Free	123	70	56.9%
ICONA	257	158	61.5%
VACH	924	701	75.9%
BONN	37	30	81.1%
Cologne	99	91	91.9%

Bold font denotes sites with >50% missing cause of death codes and therefore, exclusion in the sensitivity analysis (Table 5).

Additional File 2, Table 2. Unadjusted models for hazard ratios of cause-specific mortality

Type of death	N=6,712 coded deaths	HR (95% CI) Tuberculosis	HR (95% CI) Pneumocystis	HR (95% CI) Non-Hodgkin Lymphoma	HR (95% CI) All ADEs
ADEs	2,661	4.04 (3.43-4.75)	10.99 (9.72-12.44)	33.56 (29.74-37.88)	13.90 (12.86-15.01)
All NADEs	4,051	2.18 (1.83-2.59)	3.05 (2.56-3.63)	2.90 (2.16-3.91)	3.50 (3.26-3.75)
NADE malignancy	956	2.19 (1.53-3.13)	2.28 (1.51-3.45)	5.93 (3.85-9.14)	3.70 (3.21-4.26)
Accident, Suicide, Overdose	673	1.69 (1.04-2.74)	2.98 (1.93-4.60)	1.98 (0.82-4.76)	2.00 (1.63-2.44)
Cardiovascular	649	2.18 (1.41-3.37)	2.64 (1.65-4.22)	0.82 (0.20-3.27)	3.32 (2.78-3.96)
NADE infection	598	3.08 (2.10-4.54)	5.75 (4.09-8.09)	1.33 (0.43-4.14)	5.13 (4.33-6.07)
Hepatic	529	1.90 (1.14-3.18)	1.96 (1.08-3.57)	1.51 (0.48-4.68)	3.32 (2.73-4.05)
Respiratory	121	1.66 (0.53-5.21)	8.33 (4.36-15.92)	4.44 (1.10-17.95)	6.51 (4.52-9.37)
Renal	68	3.01 (0.95-9.58)	2.80 (0.69-11.45)	12.18 (3.83-38.77)	6.93 (4.27-11.23)
Central nervous	57	1.16 (0.16-8.41)	1.65 (0.23-11.93)	*	4.57 (2.61-7.99)
Metabolic	41	5.15 (1.59-16.68)	*	*	3.19 (1.57-6.51)
NADE, Other	359	1.87 (1.00-3.50)	2.10 (1.05-4.25)	3.73 (1.54-9.02)	2.84 (2.21-3.64)

*Denotes that no deaths occurred in these categories.

Abbreviations: HR, hazard ratio; 95% CI, 95% confidence interval; ADE, AIDS defining event; NADE, non-AIDS defining event

Additional File 3, Table 3. Adjusted models for hazard ratios of cause-specific mortality (non-marginal structural models)+

Type of death	N=6,712 coded deaths	aHR (95% CI) Tuberculosis	aHR (95% CI) Pneumocystis	aHR (95% CI) Non-Hodgkin Lymphoma	aHR (95% CI) All ADEs
ADEs	2,661	4.07 (3.44-4.81)	8.81 (7.69-10.08)	40.76 (35.64-46.62)	15.40 (14.04-16.90)
All NADEs	4,051	1.89 (1.58-2.25)	2.22 (1.86-2.66)	2.94 (2.17-3.96)	2.68 (2.47-2.90)
NADE malignancy	956	1.87 (1.30-2.69)	1.75 (1.15-2.66)	5.44 (3.51-8.43)	2.77 (2.35-3.26)
Accident, Suicide, Overdose	673	1.60 (0.98-2.60)	2.35 (1.51-3.65)	2.34 (0.97-5.65)	1.73 (1.39-2.16)
Cardiovascular	649	1.86 (1.19-2.90)	1.76 (1.09-2.84)	0.85 (0.21-3.41)	2.13 (1.74-2.60)
NADE infection	598	2.36 (1.60-3.50)	3.46 (2.41-4.97)	1.80 (0.58-5.62)	3.52 (2.88-4.30)
Hepatic	529	1.48 (0.88-2.48)	1.40 (0.76-2.56)	1.66 (0.53-5.19)	2.70 (2.15-3.38)
Respiratory	121	1.41 (0.43-4.62)	6.93 (3.51-13.69)	3.07 (0.78-12.11)	4.80 (3.24-7.12)
Renal	68	2.59 (0.80-8.37)	1.71 (0.40-7.32)	10.38 (2.93-36.72)	5.25 (2.78-9.90)
Central nervous	57	1.15 (0.16-8.53)	1.07 (0.14-8.50)	*	3.38 (1.73-6.60)
Metabolic	41	3.49 (1.08-11.31)	*	*	1.88 (0.79-4.48)
NADE, Other	359	2.24 (1.18-4.26)	2.15 (1.06-4.36)	2.98 (1.20-7.38)	3.04 (2.29-4.02)

*Denotes that no deaths occurred in these categories.

+Models were adjusted for baseline CD4+ count, baseline HIV-1 RNA, sex, HIV transmission risk group, age, calendar year of ART initiation, baseline ART regimen (PI/NNRTI/other), ADE at time of or prior to enrollment, and ART-CC cohort.

Abbreviations: aOR, adjusted hazard ratio; 95% CI, 95% confidence interval; ADE, AIDS defining event; NADE, non-AIDS defining event

Additional File 4, Table 4. Adjusted marginal structural models for hazard ratios of cause-specific mortality+ (Excluding those with ADE at or prior to baseline)

Type of death	N=4,225 coded deaths	aHR (95% CI) Tuberculosis	aHR (95% CI) Pneumocystis	aHR (95% CI) Non-Hodgkin Lymphoma	aHR (95% CI) All ADEs
ADEs	1,308	2.86 (2.23-3.68)	4.82 (3.93-5.91)	52.59 (42.64-64.13)	12.60 (10.26-15.48)
All NADEs	2,917	1.55 (1.21-1.98)	1.96 (1.50-2.56)	3.66 (2.54-5.28)	2.37 (2.10-2.67)
NADE malignancy	683	2.15 (1.35-3.43)	1.76 (0.95-3.28)	6.56 (3.79-11.35)	2.96 (2.32-3.77)
Accident, Suicide, Overdose	528	0.75 (0.34-1.67)	2.57 (1.40-4.69)	3.43 (1.30-9.07)	1.21 (0.86-1.70)
Cardiovascular	461	1.93 (1.08-3.46)	1.45 (0.71-2.98)	0.38 (0.05-2.72)	2.25 (1.67-3.02)
NADE infection	405	1.44 (0.83-2.50)	2.44 (1.43-4.19)	2.30 (0.50-10.49)	2.34 (1.69-3.24)
Hepatic	382	0.85 (0.37-1.97)	0.83 (0.30-2.27)	3.72 (1.17-11.82)	2.30 (1.68-3.15)
Respiratory	76	1.89 (0.53-6.73)	2.24 (0.68-7.36)	2.85 (0.70-11.60)	4.96 (2.69-9.16)
Renal	50	2.65 (0.53-13.10)	0.55 (0.07-4.21)	4.65 (0.83-25.88)	4.87 (1.83-12.95)
Central nervous	36	*	0.86 (0.10-7.01)	*	1.27 (0.44-3.65)
Metabolic	29	5.46 (1.71-17.48)	*	*	1.38 (0.54-3.57)
NADE, Other	267	1.45 (0.55-3.79)	4.02 (1.61-10.04)	3.92 (1.50-10.27)	3.51 (2.37-5.18)

*Denotes that no deaths occurred in these categories.

+Models were adjusted for baseline CD4+ count, baseline HIV-1 RNA, sex, HIV transmission risk group, age, calendar year of ART initiation, baseline ART regimen (PI/NNRTI/other), ADE at time of or prior to enrollment, and ART-CC cohort.

Abbreviations: aHR, adjusted hazard ratio; 95% CI, 95% confidence interval; ADE, AIDS defining event; NADE, non-AIDS defining event