



Survival, causes of death, and risk factors associated with mortality in Barcelona HIV new diagnoses. 2001-2013

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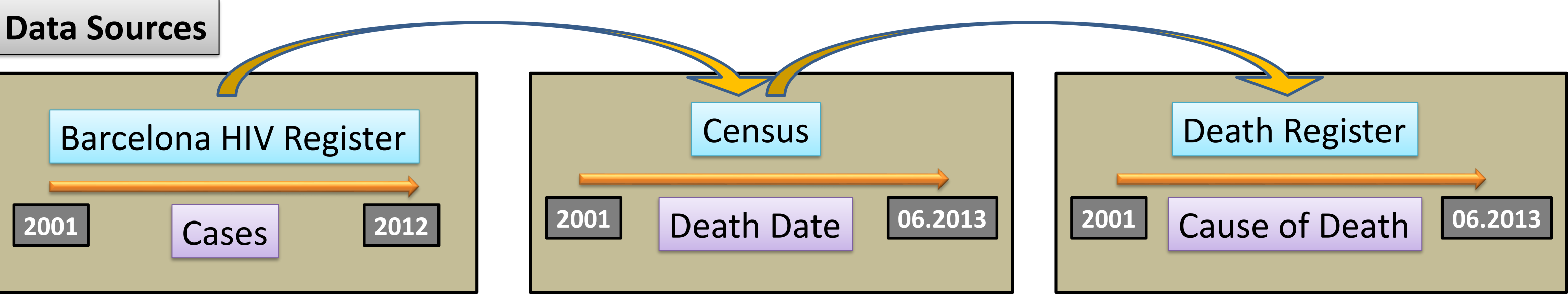
BACKGROUND

- Higher survival of HIV-patients leads to the emergence of non-HIV-related **Causes of Death** (e.g. cancer, liver disease or cardiovascular disease).
- Successful preventive plans must be based on accurate evaluation of mortality as well as associated risk factors

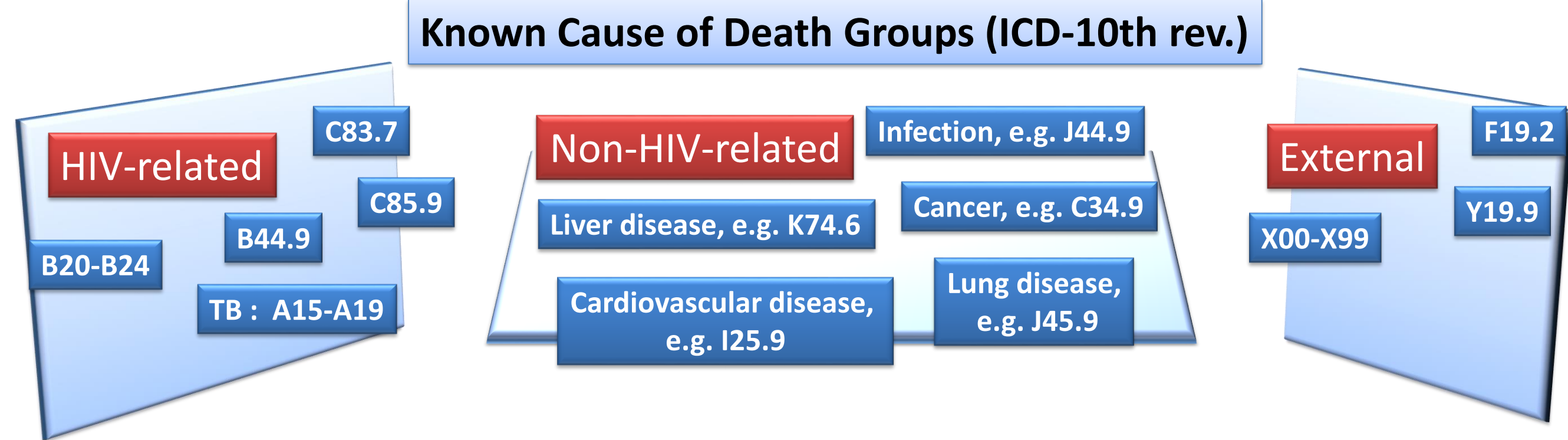
OBJECTIVES

- To calculate the mortality rates due to each cause of death of patients included in HIV-non-AIDS Cohort in Barcelona city
- To identify the factors related to worse survival

MATERIAL AND METHODS



- Population-based Cohort** of new HIV-non-AIDS diagnoses aged ≥ 18 included in Barcelona HIV Register (2001-2012)
- Mortality rates:** Per 1000 person-year (M; 95%CI) by Cause of Death Group
- Censoring date:** 30.06.2013



- Survival estimation:** Kaplan-Meier curves and Cox regression [hazard ratio (HR); 95%CI]
- Multivariable analysis adjusted by age, origin, education, district, CD4 at diagnosis, anti-HCV, HIV transmission category group by sex

RESULTS

- New HIV-non-AIDS diagnoses: 3533
- Followed: 3138 (88.8%; 17805 person/year)**
 - Men: 85.9%
 - Men who have sex with men (MSM) 61.0%
- Median age and CD4:
 - 33 years (IQR 28–40 years)
 - 399 cells/ μ L (IQR 245–579 cells/ μ L)
- ✓ 183 (5.8%) died (M:10.3; 95%CI:8.8–11.8)**
- ✓ Available Cause of Death: 149 (81.4%)**

Table 2. Mortality rates by cause of death and proportional mortality in the whole cohort and by transmission category and sex until June 2013. Barcelona city

Cause of Death ^a	Cohort (n=3138)			IDU male (n=254)			IDU female (n=75)		
	Deaths (%)	Person-Years	Rate (95% CI) ^b	Deaths (%)	Person-Years	Rate (95% CI) ^b	Deaths (%)	Person-Years	Rate (95% CI) ^b
HIV related	64 (35.0)	248	3.6 (2.7 - 4.5)	19 (37.3)	89	10.8 (6.0 - 15.7)	3 (21.4)	15	5.8 (-0.8 - 12.3)
Non-HIV related	63 (34.4)	276	3.5 (2.7 - 4.4)	13 (25.5)	64	7.4 (3.4 - 11.4)	7 (50.0)	29	13.5 (3.5 - 23.5)
Infection	7 (3.8)	32	0.4 (0.1 - 0.7)	2 (15.4)	1	1.1 (-0.4 - 2.7)	1 (14.3)	2	1.9 (-1.9 - 5.7)
Cancer	19 (10.4)	76	1.1 (0.6 - 1.5)	3 (23.1)	16	1.7 (-0.2 - 3.6)	2 (28.6)	9	3.9 (-1.5 - 9.2)
Liver	11 (6.0)	51	0.6 (0.3 - 1.0)	6 (46.2)	31	3.4 (0.7 - 6.2)	3 (42.9)	17	5.8 (-0.8 - 12.3)
Cardiovascular	13 (7.1)	69	0.7 (0.3 - 1.1)	2 (15.4)	15	1.1 (-0.4 - 2.7)	0	-	-
External causes	22 (12.0)	87	1.2 (0.7 - 1.8)	13 (25.5)	57	7.4 (3.4 - 11.4)	0	-	-
Not available	34 (18.6)	186	1.9 (1.3 - 2.6)	6 (11.8)	26	3.4 (0.7 - 6.2)	4 (28.6)	31	7.7 (0.2 - 15.3)
Total	183	797	10.3 (8.8 - 11.8)	51	235	29.1 (21.1 - 37.0)	14	75	27.0 (12.9 - 41.1)

Cause of Death ^a	MSM non-IDU (n=1913)			HTS male (n=378)			HTS female (n=347)		
	Deaths (%)	Person-Years	Rate (95% CI) ^b	Deaths (%)	Person-Years	Rate (95% CI) ^b	Deaths (%)	Person-Years	Rate (95% CI) ^b
HIV related	15 (39.5)	42	1.5 (0.7 - 2.2)	14 (32.6)	61	6.6 (3.1 - 10.0)	8 (34.8)	36	3.4 (1.1 - 5.8)
Non-HIV related	12 (31.6)	67	1.2 (0.5 - 1.9)	16 (37.2)	49	7.5 (3.8 - 11.2)	10 (43.5)	43	4.3 (1.6 - 6.9)
Infection	1 (8.3)	10	0.1 (-0.1 - 0.3)	3 (18.8)	18	1.4 (-0.2 - 3.0)	0	-	-
Cancer	3 (25.0)	12	0.3 (0.0 - 0.6)	7 (43.8)	20	3.3 (0.9 - 5.7)	1 (10.0)	2	0.4 (-0.4 - 1.3)
Liver	0	-	-	1 (6.3)	0	0.5 (-0.5 - 1.4)	0	-	-
Cardiovascular	4 (33.3)	21	0.4 (0.0 - 0.8)	2 (12.5)	7	0.9 (-0.4 - 2.2)	5 (50.0)	26	2.1 (0.3 - 4.0)
External causes	2 (5.3)	2	0.2 (-0.1 - 0.5)	7 (16.3)	28	3.3 (0.9 - 5.7)	0	-	-
Not available	9 (23.7)	52	0.9 (0.3 - 1.5)	6 (14.0)	41	2.8 (0.6 - 5.1)	5 (21.7)	29	2.1 (0.3 - 4.0)
Total	38	162	3.8 (2.6 - 4.9)	43	179	20.2 (14.2 - 26.3)	23	107	9.9 (5.8 - 13.9)

The table does not show the 171 HIV-infected individuals with unknown transmission category, neither the non-HIV-related categories “Lung non-infectious disease” (5 cases; 2.7%) and “other causes” (8 cases; 4.4%). **Bold values highlight main Causes of Death.** ^aSpecific Cause of Death groups were formed from ICD-10 codes. ^bRate per 1.000 HIV-infected individuals and its 95% confidence interval

- Bivariable analyses are showed in Fig. 1 survival curves.
- Multivariable analysis showed increased mortality in patients:

older at HIV diagnosis	Spaniards vs. immigrants	lower/primary vs. university education	Gràcia vs. Eixample district residents	injectors male and female, heterosexual male vs. MSM non-IDU	<200 vs. ≥ 500 CD4 counts at HIV diagnosis
• HR:1.3; 95%CI:1.2–1.4	• HR:2.0; 95%CI:1.3–3.0	• HR:2.3; 95%CI:1.3–4.0	• HR:2.3; 95%CI:1.3–4.1	• e.g., HR IDU male:3.8; 95%CI:2.2–6.6	• HR:1.9; 95%CI:1.2–3.0

LIMITATIONS

- Outcome identification required using different data sources (registries)
- Census is limited to Barcelona city

CONCLUSIONS & RECOMMENDATIONS

- Mortality was similar in HIV-related and non-HIV-related Cause of Death
- Low CD4 counts at diagnosis indicates **late treatment initiation**
- Loss in follow-up may affect the results in immigrants**
- Interventions aimed on improving early HIV treatment initiation need to focussed on IDU and HTS males

Table 1. Characteristics of the individuals diagnosed in Barcelona with HIV between 2001 and 2012 by sex

	HIV-infected individuals n (%)	Men n (%)	Women n (%)
Socio-demographic features			
Country of origin			
Spaniards	1733 (55.2)	1500 (55.7)	233 (52.6)
Immigrants	1403 (44.7)	1193 (44.3)	210 (47.4)
Unknown	2 (0.1)	2 (0.1)	0 (0.0)
Education level completed			
Illiteracy/Primary	574 (18.3)	413 (15.3)	161 (36.3)
Lower secondary	689 (22.0)	566 (21.0)	123 (27.8)
Upper secondary	887 (28.3)	785 (29.1)	102 (23.0)
University	911 (29.0)	866 (32.1)	45 (10.2)
Unknown	77 (2.5)	65 (2.4)	12 (2.7)
HIV transmission category			
Injecting Drug Users (IDU)	320 (10.2)	245 (9.1)	75 (16.9)
Homosexual non-IDU	1913 (61.0)	1913 (71.0)	0 (0.0)
Heterosexual non-IDU	725 (23.1)	378 (14.0)	347 (78.3)
Homosexual and IDU	9 (0.3)	9 (0.3)	0 (0.0)
Unknown	171 (5.4)	150 (5.6)	21 (4.7)
Clinical features^a			
CD4 (cells/μl)			
<200 ^b	478 (15.2)	377 (14.0)	101 (22.8)
200-349	581 (18.5)	512 (19.0)	69 (15.6)
350-499	621 (19.8)	547 (20.3)	74 (16.7)
≥ 500	899 (28.6)	791 (29.4)	108 (24.4)
Unknown	559 (17.8)	468 (17.4)	91 (20.5)
Anti-HCV			
Positive	351 (11.2)	277 (10.3)	74 (16.7)
Negative	2024 (64.5)	1756 (65.2)	268 (60.5)
Unknown	763 (24.3)	662 (24.6)	101 (22.8)
Total	3138	2695	443

^a At the time of HIV diagnosis; ^b <200 CD4 counts highlights severe immunodeficiency

Fig. 1 Survival curves according to age, country of origin, educational level, transmission, CD4, and anti-HCV antibodies

