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Belgian Research AIDS&HIV Consortium

Update on BREACH Research Activities

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A Characterization of Women Living with HIV in Belgium

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This study was sponsored by MSD

Background

- Of the estimated 38.4 million PLWH globally in 2021, women and girls represented 54% of this population and accounted for 49% of all new infections
  - By the end of 2021, women and girls accounted for 34% of all Belgian PLWH under medical care and 26% of all newly diagnosed persons

- Some physicians tend to apply the same approach to the management of HIV for both women and men despite the fact that many gender-specific differences exist
  - Varying pharmacokinetic and pharmacodynamics profiles
  - Differences in immune response to HIV infection
  - Experiencing gender-related events such as pregnancy and menopause

- In addition, WLWH are greatly under-represented in many areas of HIV research and even when they are involved, the studies are often underpowered to provide women-specific evidence

Objectives

- The primary objective of this study was to characterize WLWH in Belgium

- A single-center exploratory analysis, involving women and MLWH being treated at one of the participating centers, was also performed to explore for associations between gender and specific outcomes of interest

Design

- This was an observational, cross-sectional, multicenter study
  - Electronic data capture collected study variables on the individuals included in this study, from routine clinical practice
- The inclusion criteria, for the primary objective, were treatment-naïve and experienced cis and transgender WLWH, aged 18 years and above, being treated at one of the participating centers
  - Having had at least 1 consultation with their HIV specialist (either in-person, by telephone, or by videoconferencing) within 12 months prior to the index date of June 1, 2022
- For the exploratory analysis, inclusion criteria were all treatment-naïve and experienced PLWH (women and men), aged 18 years and above, being treated at a single participating center

Data collected

- Participant characteristics
  - Age, gender, race, BMI, and comorbidities
- HIV-related characteristics
  - Time since HIV diagnosis, mode of HIV-1 acquisition, prior AIDS-defining illness, HIV treatment status (naïve, experienced <6 months, experienced ≥6 months), time on ART and number of ART regimens, current ART regimen (indicated by class), $CD4^+$ T-cell count nadir, current $CD4^+$ and $CD8^+$ T-cell counts, and current HIV-1 VL
- Non-HIV-related laboratory parameters
  - Glomerular filtration rate, total cholesterol, triglycerides, LDL, HDL, and fasting plasma glucose

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Characteristics of the study population

	Overall *(N = 2797)*	Diagnosed ≤2 years *(N = 97)*	Transgender *(N = 51)*
Age (years), n (%)			
≥50	1356 (48.5)	14 (14.4)	17 (33.3)
<50	1441 (51.5)	83 (85.6)	34 (66.7)
Race, n (%)			
Black	2056 (73.5)	52 (53.6)	2 (3.9)
Data not available, n (%)	433 (15.5)	36 (37.1)	16 (31.4)
Most common comorbidities, n (%)			
Hypertension	484 (17.3)	5 (5.2)	3 (5.9)
Diabetes mellitus	206 (7.4)	4 (4.1)	1 (2)
Non-AIDS-defining malignancy	106 (3.8)	0 (0)	0 (0)
Neurological disease	33 (1.2)	1 (1)	0 (0)
Cardiac disease	19 (0.7)	0 (0)	0 (0)

Multivariable regression analysis revealed Black race to be the only significant association with having HTN (OR 1.99; 95% CI 1.48 – 2.68, p <0.0001)

IQR, inter-quartile range.

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Characteristics of the study population

	Overall *(N = 2797)*	Diagnosed ≤2 years *(N = 97)*	Transgender *(N = 51)*
Method of HIV acquisition, n (%)			
Heterosexual	2404 (86)	77 (79.4)	3 (5.9)
Vertical transmission	89 (3.2)	1 (1)	0 (0)
Transfusion	75 (2.7)	1 (1)	0 (0)
Homosexual/Bisexual	60 (2.1)	8 (8.3)	41 (80.4)
Intravenous drug use	29 (1)	0 (0)	0 (0)
Other	4 (0.1)	0 (0)	0 (0)
Data not available	136 (4.9)	10 (10.3)	7 (13.7)
Time since HIV diagnosis (years)			
Median (IQR)	15.6 (9.5 – 21.2)	0.8 (0.3 – 1.2)	3.5 (1.1 – 14.3)
Data not available, n (%)	1274 (45.5)	0 (0)	33 (64.7)
Prior AIDS defining illness			
N (%)	446 (15.9)	8 (8.3)	7 (13.7)
Data not available, n (%)	123 (4.4)	9 (9.3)	1 (2)
Nadir $CD4^+$ T-cell count (cells/µL)			
Median (IQR)	236 (124 – 376)	375 (228 – 587)	461 (254 – 648)
Data not available, n (%)	11 (0.4)	2 (2.1)	1 (2)

IQR, inter-quartile range.

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Characteristics of the study population

	Overall *(N = 2797)*	Diagnosed ≤2 years *(N = 97)*	Transgender *(N = 51)*
HIV treatment status, n (%)			
Experienced, <6 months	44 (1.6)	34 (35.1)	16 (31.4)
Experienced, ≥6 months	2721 (97.3)	59 (60.8)	34 (66.6)
Experienced, timing not available	3 (0.1)	0 (0)	0 (0)
Naïve	29 (1)	4 (4.1)	1 (2)
Time on ART (years)			
Median (IQR)	11.6 (6.4 – 20.1)	0.9 (0.4 – 1.5)	3.1 (1 – 10.6)
Data not available, n (%)	38 (1.4)	14 (14.4)	33 (64.7)
Number of ART regimens received			
Median (IQR)	4 (2 – 7)	1 (1 – 1)	2 (1 – 2)
Most common current ART regimen, n (%)			
2 NRTIs + 1 INSTI	954 (34.1)	48 (49.5)	19 (37.3)
2 NRTIs + 1 NNRTI	696 (24.9)	15 (15.5)	13 (25.5)
1 INSTI + 1 NRTI	405 (14.5)	15 (15.5)	9 (17.6)
2 NRTIs + 1 PI	130 (4.6)	6 (6.2)	5 (9.8)
1 INSTI + 1 NNRTI	116 (4.1)	1 (1)	1 (2)

ART, antiretroviral therapy; IQR, interquartile range; NRTI, nucleoside/nucleotide reverse transcriptase inhibitor; INSTI, integrase strand transfer inhibitor; NNRTI, non-nucleoside reverse transcriptase inhibitor; PI, protease inhibitor.

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Characteristics of the study population

	Overall (N = 2797)	Diagnosed ≤2 years (N = 97)	Transgender (N = 51)
Current CD4⁺ T-cell count (cells/µL), n (%)			
<200	73 (2.6)	8 (8.3)	0 (0)
Current HIV-1 viral load (copies/mL), n (%)			
<50	2393 (85.6)	75 (77.3)	44 (86.3)
50-199	115 (4.1)	3 (3.1)	1 (2)
≥200	142 (5.1)	16 (16.5)	1 (2)
Data not available	147 (5.3)	3 (3.1)	5 (9.8)

Multivariable analysis showed that having a CD4⁺ T-cell count at index date <500 cells/µL (OR 4.26; 95% CI 2.9 – 6.25, p <0.0001), or having had a prior AIDS-defining illness (OR 1.67; 95% CI 1.07 – 2.60, p = 0.02), were found to be significantly associated with being virologically non-suppressed (HIV-1 VL ≥200 copies/mL).

IQR, inter-quartile range.

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Laboratory parameters of the participants

	Overall		Diagnosed ≤2 years		Transgender	
	N	Median (IQR)	N	Median (IQR)	N	Median (IQR)
Glomerular filtration rate (mL/min/1.73m^2)	884	90 (74 – 106.8)	30	103 (75 – 114)	9	90 (77 – 97.5)
Fasting plasma glucose (mg/dL)	1389	91 (84 – 101)	53	90 (84 – 97)	17	88 (85 – 95)
High-density lipoprotein (mg/dL)	1329	59 (49 – 72)	50	52.5 (44 – 63)	12	46.9 (35.6 – 61.5)
Low-density lipoprotein (mg/dL)	1168	114 (92 – 141)	47	106.4 (84 – 132)	11	115 (102 – 139.2)
Triglycerides (mg/dL)	1349	89 (65 – 126)	50	86.5 (63 – 138)	12	98 (56.5 – 159.5)
Total cholesterol (mg/dL)	1369	197 (172 – 226)	51	183 (154 – 210)	12	187 (170 – 210.5)

N, number of participants with available data; IQR, inter-quartile range.

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Characteristics of the participants in the exploratory analysis

	Women *(N = 1094)*	Men *(N = 1878)*
Age (years), n (%)		
≥50	562 (51.4)	958 (51)
<50	532 (48.6)	920 (49)
Race, n (%)		
Black	861 (78.7)	491 (26.1)
White	185 (16.9)	1205 (64.2)
Other	21 (1.9)	62 (3.3)
Data not available	27 (2.5)	120 (6.4)
Transgender, n (%)	28 (2.6%)	0 (0)
Body mass index		
Median (IQR)	28.7 (25.1 – 32)	24.8 (22.6 – 27.8)
Data not available, n (%)	228 (20.8)	572 (30.5)
Most common co-morbidities, n (%)		
Hypertension	221 (20.2)	226 (12)
Diabetes mellitus	80 (7.3)	123 (6.5)
Non-AIDS-defining malignancy	43 (3.9)	65 (3.5)
Neurological disease	16 (1.5)	21 (1.1)
Cardiac disease	9 (0.8)	54 (2.9)

IQR, inter-quartile range.

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Characteristics of the participants in the exploratory analysis

	Women (N = 1094)	Men (N = 1878)
Method of HIV acquisition, n (%)		
Heterosexual	947 (86.5)	513 (27.3)
Vertical transmission	38 (3.5)	28 (1.5)
Transfusion	18 (1.6)	15 (0.8)
Homosexual/Bisexual	0 (0)	1119 (59.6)
Intravenous drug use	15 (1.4)	44 (2.3)
Data not available	76 (5.6)	159 (8.5)
Time since HIV diagnosis (years)		
Median (IQR)	18 (10.8 – 23.9)	13.3 (7.2 – 21)
Data not available, n (%)	32 (2.9)	57 (3)
Prior AIDS defining illness		
N (%)	186 (17)	243 (12.9)
Nadir $CD4^+$ T-cell count (cells/µL)		
Median (IQR)	238 (132 – 374)	303 (165 – 473)
Data not available, n (%)	3 (0.3)	7 (0.4)
HIV treatment status, n (%)		
Experienced, <6 months	19 (1.7)	60 (3.2)
Experienced, ≥6 months	1059 (96.8)	1796 (95.6)
Naïve	16 (1.5)	22 (1.2)
Time on ART (years)		
Median (IQR)	14.8 (7.8 – 21.9)	10.2 (5.7 – 18.3)
Data not available, n (%)	16 (1.5)	22 (1.2)

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Characteristics of the participants in the exploratory analysis

	Women (N = 1094)	Men (N = 1878)
Number of ART regimens received prior to current treatment		
Median (IQR)	4 (2 – 7)	3 (2 – 5.5)
Data not available, n (%)	19 (1.7)	30 (1.6)
Most common ART regimens at index date, n (%)		
2 NRTIs + 1 INSTI	345 (31.5)	683 (36.4)
2 NRTIs + 1 NNRTI	317 (29)	365 (19.4)
1 INSTI + 1 NRTI	85 (7.8)	236 (12.6)
2 NRTIs + 1 PI	143 (13.1)	199 (10.6)
1 INSTI + 1 NNRTI	31 (2.8)	88 (4.7)
$CD4^+$ T-cell count at index date (cells/µL), n (%)		
<200	33 (3)	65 (3.5)
200 – 349	82 (7.5)	147 (7.8)
350 – 499	161 (14.7)	271 (14.4)
≥500	818 (74.8)	1395 (74.3)
$CD4^+/CD8^+$ ratio at index date		
Median (IQR)	1 (0.7 – 1.4)	0.9 (0.6 – 1.2)
Data not available, n (%)	68 (6.2)	112 (6)
HIV-1 viral load (copies/mL), n (%)		
<50	965 (88.2)	1665 (88.7)
50-199	47 (4.3)	92 (4.9)
≥200	55 (5)	74 (3.9)
Data not available	27 (2.5)	47 (2.5)

Conclusion

- The results depict an ageing population that is predominantly Black
- The most common comorbidity was HTN
  - When compared to their male counterparts, WLWH had a slightly higher proportion of HTN, similar proportion of DM, and lower proportion of cardiac disease
- Most were being treated with a 3DR, with a lower proportion of women receiving a 2DR compared to MLWH
- Overall, WLWH had a low rate of virologic non-suppression, which was slightly higher than that of MLWH, but female gender was not found to be independently associated with being non-suppressed

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A Characterization of the HIV Population with Limited/Exhausted Treatment Options: A Multicenter Belgian Study

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This study was sponsored by ViiV Healthcare

Background

- Despite the availability of many potent antiretrovirals for the treatment of HIV, there is a subset of PLWH, that due to resistance, drug-drug interactions, or tolerability issues, are unable to receive a standard ART regimen from the remaining available treatment options

- As such, some of these individuals are potentially at risk of virologic non-suppression and subsequent progression of their illness

Objectives

- The primary objective was to determine the prevalence of individuals with limited/exhausted treatment options and subsequently classify them into one of the following categories (based on the 2 most recent consecutive laboratory analyses performed prior to the index date)
  - Suppressed, defined as having 2 HIV-1 VLs <50 copies/mL
  - Intermediate, defined as having at least one VL between 50 – 200 copies/mL
  - Unsuppressed, defined as having 2 HIV-1 VLs >200 copies/mL

- The secondary objective was to characterize the participants included in this analysis

Design

- This was an observational, cross-sectional, multicenter study

- We evaluated all treatment-experienced PLWH, aged ≥18 years, being treated at one of the participating HIV-reference centers, which was defined as having had at least 1 contact (in-person, telephone, or by videoconference) with their HIV specialist and performed at least 1 standard laboratory analysis, including an HIV-1 VL and $CD4^+$ cell count, within 12 months prior to the index date of April 1, 2022

Inclusion criteria

- Criterion A: having a multi-drug resistant (MDR) HIV-1 infection based on cumulative resistance data with at least one resistance test occurring between January 1, 2015 and August 1, 2021
  - MDR HIV-1 was defined as having ≥3 ARV classes that have ≤2 fully active ARVs remaining that can be effectively combined to form a viable new regimen

- Criterion B: having an extensive treatment history with multiple treatment changes due to comorbidities, toxicity, drug-drug interactions, or any other involuntary non-resistance-related reason
  - This was defined as having been treated with at least 3 core agent ARV classes and currently being on their ≥4th regimen containing either DTG twice daily (BID), DRV BID, or ETR + MVC; or has been treated with at least 4 different core agents and currently being on their 4th or subsequent regimen containing either DTG BID, DRV BID, or ETR + MVC.

Data collected

- Participant characteristics
  - Age, gender, race, weight, and co-morbidities

- HIV-related characteristics
  - Mode of HIV-1 acquisition, prior AIDS-defining illness, time on ART and number of ART regimens prior to the index date, cumulative resistance data, current ART regimen, nadir $CD4^+$ T-cell count along with the current $CD4^+$ and $CD8^+$ T-cell counts, and the two most recent consecutive HIV-1 VLs prior to the index date

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Characteristics of the study population

	Suppressed *(N = 104)*	Intermediate *(N = 11)*	Unsuppressed *(N = 4)*	Total *(N = 119)*
Criteria of inclusion, n (%)				
Criterion A	19 (18.3)	5 (45.5)	0 (0)	24 (20.2)
Criterion B	85 (81.7)	6 (54.5)	4 (100)	95 (79.8)
Age (years), n (%)				
≥50	94 (90.4)	9 (81.8)	2 (50)	105 (88.2)
<50	10 (9.6)	2 (18.2)	2 (50)	14 (11.8)
Gender, n (%)				
Male	70 (67.3)	7 (63.6)	0 (0)	77 (64.7)
Female	34 (32.7)	4 (36.4)	4 (100)	42 (35.3)
Race, n (%)				
White	60 (57.7)	5 (45.5)	0 (0)	65 (54.7)
Black	44 (42.3)	5 (45.5)	3 (75)	52 (43.7)
Other	0 (0)	1 (9)	0 (0)	1 (0.8)
Data not available	0 (0)	0 (0)	1 (25)	1 (0.8)
Weight (kg)				
Median (IQR)	76 (65 – 84)	70 (65 – 84)	72 (67 – 79)	76 (65 – 84)
Data not available, n (%)	3 (2.5)	0 (0)	0 (0)	3 (2.5)

IQR, inter-quartile range.

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Characteristics of the study population

	Suppressed *(N = 104)*	Intermediate *(N = 11)*	Unsuppressed *(N = 4)*	Total *(N = 119)*
Co-morbidities, n (%)				
Cardiovascular disease	26 (25)	2 (18.2)	2 (50)	30 (25.2)
Diabetes mellitus	19 (18.3)	3 (27.3)	0 (0)	22 (18.5)
Neurological disease	6 (5.8)	0 (0)	0 (0)	6 (5)
NADM	5 (4.8)	1 (9)	0 (0)	6 (5)
Renal disease	2 (1.9)	0 (0)	0 (0)	2 (1.7)
Active co-infection, n (%)				
HBV	2 (1.9)	0 (0)	1 (25)	3 (2.5)
HCV	0 (0)	0 (0)	0 (0)	0 (0)
Data not available	10 (9.6)	0 (0)	1 (25)	11 (9.2)
HIV Acquisition, n (%)				
Heterosexual	54 (51.9)	7 (63.6)	2 (50)	63 (52.9)
MSM	36 (34.6)	2 (18.2)	0 (0)	38 (31.9)
Other	9 (8.7)	1 (9)	2 (50)	10 (8.4)
Data not available	5 (4.8)	1 (9)	0 (0)	6 (5)

NADM, non-AIDS-defining malignancy; HBV, hepatitis B virus; HCV, hepatitis C virus; MSM, men who have sex with men.

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Characteristics of the study population

	Suppressed *(N = 104)*	Intermediate *(N = 11)*	Unsuppressed *(N = 4)*	Total *(N = 119)*
Time since HIV diagnosis (years)				
Median (IQR)	28.3 (25.9 – 29.8)	25.7 (24.8 – 32)	27.6 (25.9 – 29.8)	28.2 (24.9 – 32)
Prior AIDS defining illness				
N (%)	39 (37.5)	7 (63.6)	1 (25)	47 (43.1)
Data not available, n (%)	9 (8.7)	0 (0)	1 (25)	10 (8.4)
Nadir $CD4^+$ T-cell count (cells/µL)				
Median (IQR)	99.5 (29.5 – 184.5)	16 (4 – 90)	45 (20 – 61)	82 (20 – 180)
Time on ART (years)				
Median (IQR)	25.1 (21.7 – 26.1)	24.4 (23.8 – 25.2)	21.5 (18.3 – 24.6)	24.8 (21.7 – 26)
Data not available, n (%)	3 (2.8)	1 (9)	0 (0)	4 (3.4)
Number of ARVs received				
Median (IQR)	15 (13 – 18)	17 (15 – 18)	17 (14.5 – 20)	15 (13 – 18)

IQR, inter-quartile range; ART, antiretroviral therapy; ARV, antiretroviral.

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Characteristics of the study population

	Suppressed *(N = 104)*	Intermediate *(N = 11)*	Unsuppressed *(N = 4)*	Total *(N = 119)*
ARVs in current regimen, n (%)				
Two	21 (20.2)	4 (36.4)	2 (50)	27 (22.7)
Three	47 (45.2)	2 (18.2)	1 (25)	50 (42)
Four	25 (24)	4 (36.4)	0 (0)	29 (24.4)
Five	11 (10.6)	0 (0)	1 (25)	12 (10.1)
Six	0 (0)	1 (9)	0 (0)	1 (0.8)
Most common ART regimens at index date – n (%)	DRV/c + DTG – 11 (10.7) DRV/r + ETR + RAL – 9 (8.7) DRV/c + DTG + MVC – 5 (4.8) DRV/c/FTC/TAF + DTG – 4 (3.8)	DRV/r + DTG – 2 (18.2) DRV/c/FTC/TAF + DTG – 2 (18.2) BIC/FTC/TAF + MVC – 1 (9.1) DTG/3TC + DOR – 1 (9.1)	DRV/r + DTG – 2 (50) ATV/r + DTG + MVC – 1 (25) DRV/c + ABC/3TC/DTG + RPV – 1 (25)	DRV/c + DTG – 11 (9.2) DRV/r + ETR + RAL – 9 (7.6)
$CD4^+$ T-cell count at index date (cells/µL), n (%)				
<200	3 (2.9)	1 (9.1)	2 (50)	6 (5)
200 – 349	11 (10.6)	1 (9.1)	1 (25)	13 (10.9)
350 – 499	18 (17.3)	3 (27.3)	1 (25)	22 (18.5)
≥500	72 (69.2)	6 (54.5)	0 (0)	78 (65.6)
$CD4^+/CD8^+$ ratio at index date				
Median (IQR)	0.7 (0.4 – 1)	0.3 (0.1 – 0.6)	0.3 (0.1 – 0.4)	0.6 (0.4 – 1)
Value of HIV-1 VL ≥50 copies/mL				
Median (IQR)	N/A	102 (40 – 198)	1880 (1140 – 56260)	171 (65 – 1240)

ARV, antiretrovirals; ART, antiretroviral therapy; DRV/c; darunavir/cobicistat; DTG, dolutegravir; DRV/r; darunavir/ritonavir; ETR, etravirine ; RAL, raltegravir; MVC, maraviroc; FTC/TAF, emtricitabine/tenofovir alafenamide; BIC, bictegravir; 3TC, lamivudine; DOR, doravirine; ATV/r; atazanavir/ritonavir; ABC, abacavir; RPV, rilpivirine. IQR, inter-quartile range; VL, viral load.

Conclusion

- Individuals with limited/exhausted treatment options represented a small fraction (0.97%) of the population evaluated
- Most were on a 2 or 3-drug ART regimen, were virologically suppressed, and had a $CD4^+$ T-cell count within normal range
- A small proportion were not fully suppressed while some, despite being virologically suppressed, were on ≥4-drug ART regimens or on regimens that could have future implications, such as having DDIs with potential non-HIV medications
  - Therefore, these regimens may not be the most optimal treatments for the ever-aging HIV population and as such, new therapeutic options such as FTR, LEN, or even broadly neutralizing antibodies (bNAbs) will be needed to ensure virologic suppression in these individuals and correspondingly, decrease their pill burden
- Lastly, a standardized definition of PLWH with limited/exhausted treatment options will be required in order to accurately identify these individuals in the future

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Upcoming Studies

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Use of long-acting injectable cabotegravir/rilpivirine for the treatment of HIV in Belgium

- Cross-sectional evaluation of patient perception of, and satisfaction with, LAI CAB/RPV for the treatment of HIV
  - A 32-item PRO questionnaire

- A retrospective analysis of various endpoints
  - Virologic suppression
  - Viral blips
  - Discontinuation
  - Change in weight
  - …

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Efficacy, durability, and tolerability of bictegravir/emtricitabine/tenofovir alafenamide for the treatment of HIV in a real-world setting in Belgium: week 144 analysis

- Treatment-naïve and -experienced PLWH, aged ≥18 years, who received BIC/FTC/TAF between January 1, 2019 and September 30, 2020
- Prolongation of the 48-week analysis previously performed

Thank you for your attention!