	Cohort 1: client experience (n=1165)			**Cohort 2: 30 days late before next visit* (n=176 793 unique individuals; 780 614 visits)**			**Cohort 3: in care at 15 months (n=85 003)**		**Cohort 4: treatment success (n=933)**	
	Control (n=679)	<6 months intervention (n=255)	≥6 months intervention (n=231)	Control (n=107 220 **unique individuals**; 358 741 visits)	<6 months intervention (n=111 429 **unique individuals**; 178 523 visits)	≥6 months intervention (n=90 984 **unique individuals**; 243 350 visits)	Control (n=41 998)	Intervention (n=43 005)	Control (n=453)	Intervention (n=480)
Sex										
Female	337 (49·6%)	130 (51·0%)	120 (51·9%)	227 172 (63·3%)	112 240 (62·9%)	151 429 (62·2%)	27 461 (65·4%)	27 530 (64·0%)	266 (58·7%)	273 (56·9%)
Male	342 (50·4%)	125 (49·0%)	111 (48·1%)	131 569 (36·7%)	66 283 (37·1%)	91 921 (37·8%)	14 537 (34·6%)	15 475 (36·0%)	187 (41·3%)	207 (43·1%)
Age at study enrolment†, years	38 (31–46)	38 (31–45)	37 (31–45)	39 (32–46)	39 (31–46)	38 (31–45)	39 (32–46)	39 (32–46)	37 (31–44)	37 (30–44)
Age group at										

study enrolment, years										
<25	57 (8·4%)	28 (11·0%)	24 (10·4%)	29 122 (8·1%)	15 307 (8·6%)	23 353 (9·6%)	3183 (7·6%)	3073 (7·1%)	46 (10·2%)	47 (9·8%)
25–34	216 (31·8%)	84 (32·9%)	77 (33·3%)	100 401 (28·0%)	50 609 (28·3%)	72 088 (29·6%)	11 744 (28·0%)	11 876 (27·6%)	146 (32·2%)	152 (31·7%)
35–44	233 (34·3%)	86 (33·7%)	83 (35·9%)	131 923 (36·8%)	64 346 (36·0%)	86 160 (35·4%)	15 701 (37·4%)	15 916 (37·0%)	161 (35·5%)	171 (35·6%)
45–59	155 (22·8%)	52 (20·4%)	45 (19·5%)	85 414 (23·8%)	41 928 (23·5%)	53 888 (22·1%)	10 026 (23·9%)	10 621 (24·7%)	92 (20·3%)	107 (22·3%)
>60	18 (2·7%)	5 (2·0%)	2 (0·9%)	11 561 (3·2%)	6123 (3·4%)	7447 (3·1%)	1321 (3·1%)	1493 (3·5%)	8 (1·8%)	3 (0·6%)
Missing	0	0	0	320 (0·1%)	210 (0·1%)	414 (0·2%)	23 (0·1%)	26 (0·1%)	0	0
Group										
Group 1	..	..	..	0	73 285 (41·1%)	179 423 (73·7%)	..	43 005 (100·0%)	..	480 (100·0%)
Group 2	110 (16·2%)	81 (31·8%)	164 (71·0%)	36 956 (10·3%)	41 399 (23·2%)	42 449 (17·4%)	..	..	..	..
Group 3	120 (17·7%)	58 (22·7%)	62 (26·8%)	110 311	36 654 (20·5%)	21 478 (8·8%)	..	..	..	..

				(30·7%)						
Group 4	449 (66·1%)	116 (45·5%)	5 (2·2%)	211 474 (58·9%)	27 185 (15·2%)	0	41 998 (100·0%)	··	453 (100·0%)	··
Period										
Period 1	290 (42·7%)	··	··	163 209 (45·5%)	73 285 (41·1%)	0	41 998 (100·0%)	43 005 (100·0%)	453 (100·0%)	480 (100·0%)
Period 2	177 (26·1%)	81 (31·8%)	43 (18·6%)	141 437 (39·4%)	41 399 (23·2%)	86 485 (35·5%)	··	··	··	··
Period 3	212 (31·2%)	58 (22·7%)	65 (28·1%)	54 095 (15·1%)	36 654 (20·5%)	86 435 (35·5%)	··	··	··	··
Period 4	0	116 (45·5%)	123 (53·2%)	0	27 185 (15·2%)	70 430 (28·9%)	··	··	··	··
Care status										
New ART	··	··	··	19 422 (5·4%)	10 096 (5·7%)	15 113 (6·2%)	4478 (10·7%)	4353 (10·1%)	128 (28·3%)	134 (27·9%)
In care	421 (62·0%)	148 (58·0%)	125 (54·1%)	274 377 (76·5%)	139 620 (78·2%)	177 612 (73·0%)	29 370 (69·9%)	29 511 (68·6%)	229 (50·6%)	218 (45·4%)
Returner	258 (38·0%)	107 (42·0%)	106 (45·9%)	64 942 (18·1%)	28 807 (16·1%)	50 625 (20·8%)	8150 (19·4%)	9141 (21·3%)	96 (21·2%)	128 (26·7%)

Viral suppression at study enrolment										
Suppressed	..	..	..	..	..	..	..	..	260 (57·4%)	261 (54·4%)
Not suppressed	..	..	..	..	..	..	..	..	187 (41·3%)	209 (43·5%)
Missing	..	..	..	..	..	..	..	..	6 (1·3%)	10 (2·1%)
WHO stage at ART enrolment										
Stage 1	332 (48·9%)	128 (50·2%)	106 (45·9%)	183 346 (51·1%)	90 625 (50·8%)	124 407 (51·1%)	21 434 (51·0%)	21 746 (50·6%)	241 (53·2%)	256 (53·3%)
Stage 2	87 (12·8%)	30 (11·8%)	31 (13·4%)	47 081 (13·1%)	22 856 (12·8%)	29 202 (12·0%)	5423 (12·9%)	5560 (12·9%)	71 (15·7%)	46 (9·6%)
Stage 3	94 (13·8%)	40 (15·7%)	33 (14·3%)	57 761 (16·1%)	28 700 (16·1%)	36 250 (14·9%)	6815 (16·2%)	7020 (16·3%)	50 (11·0%)	49 (10·2%)
Stage 4	7 (1·0%)	0	1 (0·4%)	4270 (1·2%)	2507 (1·4%)	3246 (1·3%)	500 (1·2%)	664 (1·5%)	2 (0·4%)	3 (0·6%)

Missing	159 (23·4%)	57 (22·4%)	60 (26·0%)	66 283 (18·5%)	33 835 (19·0%)	50 245 (20·6%)	7826 (18·6%)	8015 (18·6%)	89 (19·6%)	126 (26·3%)
Date of HIV care enrolment										
<2010	101 (14·9%)	34 (13·3%)	24 (10·4%)	65 127 (18·2%)	31 146 (17·4%)	36 778 (15·1%)	7569 (18·0%)	7531 (17·5%)	58 (12·8%)	47 (9·8%)
2010–2014	95 (14·0%)	34 (13·3%)	32 (13·9%)	53 268 (14·8%)	25 924 (14·5%)	33 013 (13·6%)	6902 (16·4%)	7141 (16·6%)	58 (12·8%)	48 (10·0%)
2014–2017	135 (19·9%)	46 (18·0%)	40 (17·3%)	64 332 (17·9%)	31 028 (17·4%)	39 308 (16·2%)	8225 (19·6%)	8503 (19·8%)	73 (16·1%)	78 (16.3%)
2017–2019	195 (28·7%)	61 (23·9%)	64 (27·7%)	76 009 (21·2%)	37 655 (21·1%)	49 141 (20·2%)	10 201 (24·3%)	11 037 (25·7%)	92 (20·3%)	120 (25·0%)
>2019	153 (22·5%)	80 (31·4%)	71 (30·7%)	100 005 (27·9%)	52 770 (29·6%)	85 110 (35·0%)	9101 (21·7%)	8793 (20·4%)	172 (38·0%)	187 (39·0%)
Marital status										
Single	91 (13·4%)	40 (15·7%)	37 (16·0%)	43 547 (12·1%)	20 835 (11·7%)	26 868 (11·0%)	4827 (11·5%)	3900 (9·1%)	70 (15·5%)	49 (10·2%)
Married	355 (52·3%)	121 (47·5%)	113 (48·9%)	195 487 (54·5%)	95 590 (53·5%)	131 557 (54·1%)	23 113 (55·0%)	23 954 (55·7%)	257 (56·7%)	234 (48·8%)

Divorced	63 (9·3%)	25 (9·8%)	28 (12·1%)	39 716 (11·1%)	19 340 (10·8%)	26 236 (10·8%)	4609 (11·0%)	4472 (10·4%)	49 (10·8%)	66 (13·8%)
Widowed	48 (7·1%)	20 (7·8%)	14 (6·1%)	29 029 (8·1%)	14 274 (8·0%)	18 816 (7·7%)	3482 (8·3%)	3641 (8·5%)	26 (5·7%)	26 (5·4%)
Missing	122 (18·0%)	49 (19·2%)	39 (16·9%)	50 962 (14·2%)	28 484 (16·0%)	39 873 (16·4%)	5967 (14·2%)	7038 (16·4%)	51 (11·3%)	105 (21·9%)
Education status at ART enrolment										
None	22 (3·2%)	8 (3·1%)	7 (3·0%)	19 361 (5·4%)	9135 (5·1%)	11 467 (4·7%)	2108 (5·0%)	2106 (4·9%)	23 (5·1%)	19 (4·0%)
Primary	98 (14·4%)	32 (12·5%)	37 (16·0%)	92 602 (25·8%)	45 857 (25·7%)	61 282 (25·2%)	10 753 (25·6%)	11 812 (27·5%)	114 (25·2%)	116 (24·2%)
Secondary	384 (56·6%)	152 (59·6%)	128 (55·4%)	174 279 (48·6%)	87 138 (48·8%)	121 241 (49·8%)	20 297 (48·3%)	20 790 (48·3%)	233 (51·4%)	228 (47·5%)
University	61 (9·0%)	20 (7·8%)	26 (11·3%)	20 010 (5·6%)	10 668 (6·0%)	14 184 (5·8%)	1939 (4·6%)	1856 (4·3%)	19 (4·2%)	16 (3·3%)
Missing	114 (16·8%)	43 (16·9%)	33 (14·3%)	52 489 (14·6%)	25 725 (14·4%)	35 176 (14·5%)	6901 (16·4%)	6441 (15·0%)	64 (14·1%)	101 (21·0%)

Data are n (%) or median (IQR). Viral load and retention are longitudinal outcomes that were assessed after 15 months of intervention experience. The variable group 1 is composed of all individuals who were in clinics in which the intervention was rolled out earliest in calendar time. ART=antiretroviral

therapy. *Numbers for this cohort are reported at the visit level. Unique individuals may have visits during both control and intervention periods. †Numbers of participants who were missing age data are reported in categorical age variables.

Table 1: **Participant characteristics for patient experience, missed visits, retention in care, and treatment success**

	Participants	**Control (n=632)**		**<6 months intervention (n=249)**		**≥6 months intervention (n=230)**		**Control *vs* <6 months intervention**		**Control *vs* ≥6 months intervention**	
		Sum score*	Bad experience†	Sum score*	Bad experience†	Sum score*	Bad experience†	Adjusted difference for sum score (95% CI; p value)	Adjusted difference for bad experience, percentage points (95% CI; p value)	Adjusted difference for sum score (95% CI; p value)	Adjusted difference for bad experience, percentage points (95% CI; p value)
Overall	1111	9·9 (2·3)	147/632 (23·3%)	10·7 (1·9)	33/249 (13·3%)	11·1 (1·2)	8/230 (3·5%)	0·4 (0·0 to 0·8; 0·036)	–5·4 (–13·4 to 2·6; 0·19)	1·0 (0·5 to 1·5; <0·001)	–16·9 (–24·8 to –8·9; <0·001)
Baseline care status											
In care	651	9·8 (2·4)	98/383 (25·6%)	10·6 (2·1)	21/144 (14·6%)	11 (1·3)	4/124 (3·2%)	0·5 (0·0 to 1·0; 0·057)	–8·0 (–18·4 to –2·5; 0·14)	1·3 (0·6 to 2·0; <0·001)	–20·4 (–30·1 to –10·8; <0·001)
Returner	460	10·1 (2·3)	49/249 (19·7%)	10·9 (1·7)	12/105 (11·4%)	11·1 (1·1)	4/106 (3·8%)	0·3 (–0·3 to 0·9; 0·29)	–2·2 (–13·8 to 9·3; 0·71)	0·6 (–0·2 to 1·4; 0·14)	–11·2 (–22·4 to 0·0; 0·088)
Sex											
Female	566	9·6 (2·4)	8/3198 (27·6%)	10·5 (2·1)	22/127 (17·3%)	11·0 (1·3)	2/120 (1·7%)	0·3 (–0·3 to 0·9; 0·28)	–6·7 (–18·9 to 5·6; 0·29)	1·0 (0·2 to 1·8; 0·010)	–24·0 (–34·8 to –

											13·2; <0·001)
Male	545	10·2 (2·2)	59/313 (18·8%)	10·9 (1·6)	11/122 (9·0%)	11·2 (1·1)	6/110 (5·5%)	0·5 (–0·1 to 1·0; 0·087)	–5·4 (–15·1 to 4·3; 0·29)	0·8 (0·1 to 1·5; 0·022)	–9·2 (–19·4 to 1·1; 0·12)
Age, years											
<25	95	10·0 (2·1)	8/48 (16·7%)	9·9 (2·7)	6/25 (24·0%)	11·2 (1·1)	0/22	–0·7 (–1·9 to 0·5; 0·24)	28·5 (–2·5 to 59·4; 0·082)	–0·1 (–1·5 to 1·3; 0·89)	–20·2‡
25–44	732	9·7 (2·5)	115/417 (27·6%)	10·6 (2·0)	25/163 (15·3%)	11·0 (1·4)	8/152 (5·3%)	0·3 (–0·2 to 0·9; 0·20)	–6·0 (–16·4 to 4·4; 0·26)	0·8 (0·1 to 1·5; 0·020)	–17·8 (–27·9 to –7·7; 0·002)
>45	284	10·5 (1·9)	24/167 (14·4%)	11·3 (1·1)	2/61 (3·3%)	11·3 (0·8)	0/56	0·8 (0·2 to 1·5; 0·008)	–15·2 (–29·9 to –0·4; 0·10)	1·2 (0·4 to 2·0; 0·002)	–19·3‡

Data are n, mean (SD), or n (%), unless otherwise stated. *Sum score of 12-item patient experience instrument. Results represent crude mean sum score with standard deviation and adjusted mean differences from mixed-effects linear regression. †Bad experiences indicate interactions with sum score ≤8 (approximately in bottom 15th percentile). Results represent crude number and percent and adjusted risk differences from mixed-effects logistic regression. ‡95% CI and p value were not estimable in regression models due to positivity violations (ie, perfect prediction due to no reported bad patient experiences for intervention ≥6 months).

Table 2: **Effect of the PCC intervention on client experience, cohort 1**

	Visits	**Missed visits in the control periods (n=358 741)**	**Missed visits during <6 months intervention (n=178 523)**	**Missed visits during ≥6 months intervention (n=243 350)**	**Control *vs* <6 months intervention**		**Control *vs* ≥6 months intervention**	
					Adjusted risk difference, percentage points	p value	Adjusted risk differenc e,	p value

					(95% CI)		percentage points (95% CI)	
Overall	780 614	90 593/358 741 (25·3%)	40 380/178 523 (22·6%)	52 288/243 350 (21·5%)	–2·1 (–2·5 to –1·7)	<0·001	–4·2 (–4·8 to –3·7)	<0·001
Baseline care status								
New ART	44 631	6715/19 422 (34·6%)	3219/10 096 (31·9%)	4323/15 113 (28·6%)	–1·3 (–2·8 to 0·3)	0·13	–5·0 (–7·4 to –2·7)	<0·001
In care	591 609	63 167/274 377 (23·0%)	28 635/139 620 (20·5%)	33 305/177 612 (18·8%)	–2·5 (–3·0 to –2·1)	<0·001	–4·6 (–5·2 to –3·9)	<0·001
Returner	144 374	20 711/64 942 (31·9%)	8526/28 807 (29·6%)	14 660/50 625 (29·0%)	–0·6 (–1·6 to 0·4)	0·23	–2·1 (–3·6 to –0·6)	0·005
Sex								
Female	490 841	58 508/227 172 (25·8%)	25 733/112 240 (22·9%)	33 001/151 429 (21·8%)	–2·9 (–3·4 to –2·4)	<0·001	–5·6 (–6·3 to –4·9)	<0·001
Male	289 773	32 085/131 569 (24·4%)	14 647/66 283 (22·1%)	19 287/91 921 (21·0%)	–0·7 (–1·3 to –0·1)	0·031	–1·9 (–2·9 to –1·0)	<0·001
Age group, years								
<25	67 782	8628/29 122 (29·6%)	3980/15 307 (26·0%)	6083/23 353 (26·1%)	–2·2 (–3·6 to –0·8)	0·002	–3·1 (–5·1 to –1·0)	0·003

25–44	505 527	60 289/232 324 (26·0%)	26 641/114 955 (23·2%)	34 899/158 248 (22·1%)	–2·2 (–2·6 to –1·7)	<0·001	–4·4 (–5·1 to –3·7)	<0·001
>45	206 361	21 569/96 975(22·2%)	9697/48 051 (20·2%)	11 166/61 335 (18·2%)	–1·9 (–2·6 to –1·1)	<0·001	–4·4 (–5·4 to –3·3)	<0·001

Data are n or n (%), unless otherwise stated. Missed visits are measured among 176 793 unique individuals.

Table 3: **Effect of the PCC intervention on missed visits by 30 days, cohort 2**

	Participants	**In Care at 15 months, Control (n=41 998)**	**In Care at 15 months, Intervention (n=43 005)**	**Adjusted risk difference, (95% CI)**	**p value**
Overall	85 003	33 668/41 998 (80·2%)	35 959/43 005 (83·6%)	5·9 (0·6 to 11·2)	0·026
Baseline care status					
New ART	8831	1980/4478 (44·2%)	2447/4353 (56·2%)	12·7 (1·4 to 23·9)	0·030
In care	58 881	25 123/29 370 (85·5%)	25 727/29 511 (87·2%)	4·1 (0·2 to 8·0)	0·038
Returner	17 291	6565/8150 (80·6%)	7785/9141 (85·2%)	5·0 (0·1 to 10·1)	0·049
Sex					
Female	54 991	21 805/27 461 (79·4%)	22 872/27 530 (83·1%)	6·6 (0·8 to 12·4)	0·022
Male	30 012	11 863/14 537 (81·6%)	13 087/15 475 (84·6%)	3·7 (0·0 to 7·4)	0·051
Age group, years					
<25	6256	1994/3183 (62·7%)	2111/3073 (68·7%)	7·5 (–1·0 to 16·0)	0·087

25–44	55 237	21 574/27 445 (78·6%)	23 031/27 792 (82·9%)	6·9 (1·1 to 12·7)	0·018
>45	23 461	10 088/11 347 (88·9%)	10 804/12 114 (89·2%)	1·2 (–1·3 to 3·7)	0·34

Data are n or n (%).

Table 4: **Effect of the PCC intervention on retention in care at 15 months, cohort 3**

		Treatment Success, Control (n=453)	**Treatment Success, Intervention (n=480)**	**Adjusted risk difference, (95% CI)**	**p value**
Overall	933	379/453 (83·7%)	402/480 (83·8%)	0·9 (–5·4 to 7·2)	0·78
Baseline care status					
New ART	262	99/128 (77·3%)	106/134 (79·1%)	2·1 (–13·8 to 18·1)	0·79
In care	447	211/229 (92·1%)	199/218 (91·3%)	–0·8 (–7·2 to 5·5)	0·80
Returner	224	69/96 (71·9%)	97/128 (75·8%)	3·4 (–10·5 to 17·2)	0·63
Baseline treatment success status					
Plasma HIV RNA suppressed	519	239/260 (91·9%)	240/261 (92·0%)	0·0 (–6·9 to 6·8)	0·99
Plasma HIV RNA not suppressed	396	136/187 (72·7%)	152/209 (72·7%)	0·5 (–10·7 to 11·7)	0·93
Sex					
Female	539	224/266 (84·2%)	237/273 (86·8%)	2·6 (–5·9 to 11·0)	0·55

Male	394	155/187 (82·9%)	165/207 (79·7%)	–1·3 (–10·0 to 7·4)	0·77
Age group, years					
<25	92	32/46 (69·6%)	38/47 (80·9%)	13·6 (–1·4 to 28·6)	0·11
25–44	630	261/307 (85·0%)	269/323 (83·3%)	–1·1 (–7·0 to 4·9)	0·72
>45	210	86/100 (86·0%)	95/110 (86·4%)	2·1 (–5·3 to 9·5)	0·65

Table 5: **Effect of the PCC intervention on treatment success at 15 months, cohort 4**