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Background

- Most studies of engagement in care (EIC) in people living with HIV use a simplistic definition of EIC based on the number of clinic visits per year, and examine limited predictors of EIC.
- We adapted an existing EIC algorithm for adults living with HIV in England¹, for use in young people (YP) and applied it to YP with perinatal HIV (PHIV) in the Adolescent and Adults Living with Perinatal HIV (AALPHI) cohort in 2013-2015.

Methods

AALPHI

- AALPHI was a prospective cohort study which commenced in 2012 and recruited two groups of young people, PHIV, and an HIV- but HIV-affected comparison group. Both groups were recruited from NHS clinics and voluntary sector organisations across England.
- Young people with PHIV were: aged 13-21 years, previously or currently receiving paediatric care in England, able to give informed consent/assent, aware of their HIV status for at least 6 months.

Baseline predictors of engagement in care

- Routine clinical data collected by the Collaborative HIV Paediatric study and data from the baseline AALPHI interview were considered as potential predictors of EIC (Table 1).

Table 1: Variables included in the analysis shown in the 7 domains

Domain	Variables
<i>A priori</i>	Time from AALPHI interview (months), sex, age, ethnicity, born outside of the UK/Ireland
Sociodemographic	Education/employment status, ever excluded from school, death of one or both parents, fostered/adopted, number of main carers, live with parents/carers, parent/carer in work, main language spoken at home, IDACI deprivation score
Risk behaviour practices	Ever smoked cigarettes, alcohol amount, use of recreational drugs, ever had sex (anal or vaginal), age at first sex, use of condoms
Mental Health	Perceptions about HIV, ever self-harmed, ever felt life not worth living, major life events, quality of life, self-esteem, anxiety, depression
Cognition	NPZ-6 score
Clinic	Clinic location, clinic type, distance from home to clinic, travel time from home to clinic
HIV experience management	Age told about HIV diagnosis, how many people participant has told about their HIV, number of doses missed in last 3 days, self-assessment of HIV
HIV markers	CDC C stage, CD4 nadir, current CD4, current VL, time on ART, on EFV, treatment interruption

Adapting the adult algorithm for EIC for young people

- The adult algorithm¹ predicts when the next clinic visit will be scheduled within 1-6 months following the current visit, based on routinely collected clinical data including antiretroviral therapy (ART) management, CD4 count and HIV viral load (VL).

Figure 1: EIC flowchart for young people on ART VL ≤50 c/mL

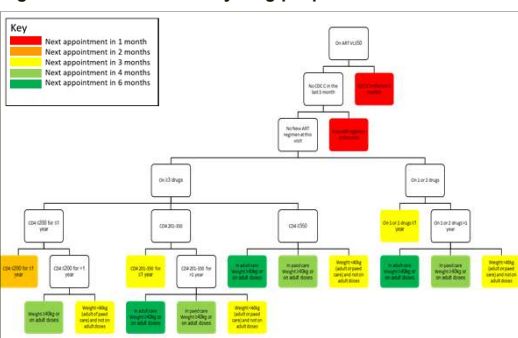
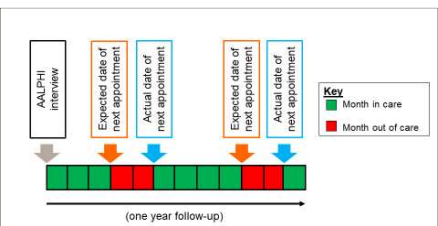


Figure 2: Example of engagement in care over 1 year



- To adapt it for young people with PHIV, the algorithm was updated to the latest (2016) guidelines^{2,3} and adapted in consultation with 8 HIV consultants from 5 UK clinics.
- Three flowcharts were developed for young people: on ART VL ≤50 c/mL, on ART VL >50c/mL and off ART. Figure 1 shows an example flowchart.

- Time since AALPHI interview date (baseline) was split into 1 month periods across 12 months of follow-up. Each person-month was classified as engaged in care (patient had a clinic visit or not yet due for clinic visit) or not engaged in care (patient overdue a clinic visit).

Statistical analysis

- Logistic regression models (allowing for clustered data) were used to explore multivariable predictors of being engaged in care.
- Multivariable models, adjusted for a priori factors, were first fitted separately within each domain (Table 1) with those with p>0.15 removed using backward stepwise selection. All variables retained in this step were carried forward to the final model and those with p>0.05 removed using backwards selection.
- Checks for collinearity were carried out within each domain and splines were used to model non-linear relationships.

Results

Participant characteristics

- 306 young people were included in the analysis. Their characteristics are shown in Table 2.

Table 2: Participant characteristics at the start of follow-up

Characteristic	No (%) Median [IQR]	Characteristic	No (%)
Sex		Born outside the UK/Ireland	
Female	179 (59)	Yes	180 (59)
Male	127 (41)	No	126 (41)
Age, years	17 [15-18]	CD4 count (cells/μL)	
Age group		≤200	17 (6)
≤15 years	120 (39)	201-350	26 (9)
16-18 years	127 (42)	351-499	63 (22)
≥19 years	59 (19)	≥ 500	179 (62)
Ethnic group		Viral load	
Black	262 (86)	≤50c/mL	202 (69)
Asian, mixed, other	35 (11)	>50c/mL	89 (31)
White	9 (3)		

- Across the 12 month follow-up period there were a total of 3,585 person-months of follow-up. 87% of these person-months were classified as engaged in care.

Multivariable predictors of engagement in care

Table 3: Predictors of engagement in care

Baseline characteristic	Adjusted odds ratio (95% CI)	p value
A-priori domain:		
Month of follow-up (1-12)	0.97 (0.93, 1.02)	0.24
Sex, Male (ref)	1	
Female	1.29 (0.86, 1.94)	0.22
Age	0.94 (0.87, 1.02)	0.15
Ethnicity, Black (ref)	1	
Asian, mixed, prefer not to say	0.44 (0.25, 0.78)	
White	1.05 (0.29, 3.81)	0.02
Born outside the UK, No (ref)	1	
Yes	0.86 (0.57, 1.30)	0.47
Variables from the other domains:		
Ever self-harmed, No (ref)	1	
Yes	0.55 (0.32, 0.95)	0.03
Adherence self-assessment, Good/excellent (ref)	1	
Not so good/bad	0.46 (0.25, 0.84)	
Not on ART	0.64 (0.34, 1.21)	0.04
Viral load, ≤50 c/mL (ref)	1	
>50 c/mL	0.47 (0.30, 0.75)	0.002

- Among the a priori variables, only ethnicity was significant with Asian/mixed/prefer not to say participants least likely to be engaged in care.
- From the other domains, having ever self-harmed, poor adherence and viral load >50 c/mL were independent predictors of EIC.

Conclusions

- Identifying which YP are less likely to engage in care may allow targeted interventions to support YP to attend clinic, which is crucial to improve their health outcomes.
- VL and ethnicity, which are easily available in clinic, are strongly associated with EIC in this cohort.
- In addition, assessment of self-harm and self-rated adherence may help clinics identify young people at risk of lower EIC, while at the same time facilitate multidisciplinary clinic support to address YP's mental health needs.

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