EVALUATION OF THE FINANCIAL COST OF TREATING PEOPLE LIVING WITH THE HUMAN IMMUNODEFICIENCY VIRUS IN THE UNITED KINGDOM VERSUS MATCHED HIV-NEGATIVE CONTROLS IN 2004, 2010 and 2017

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Introduction

- Over the last two decades the survival rates for people living with the human immunodeficiency virus (PLHIV) have dramatically improved.[1]

- Due to the changing pattern of illness in the ageing PLHIV cohort, it is expected the differing costs of care will change over the same period.

- For example, higher rates of related comorbidities have been reported,[2] inferring greater resource requirements for this cohort of patients.

- Previous research has reported a 5-fold increase in outpatient visits in the first-year post diagnosis compared to matched HIV-negative controls.[3]

- The cost impact associated with increased survival and greater healthcare resource use in PLHIV remains largely unknown.

Objectives

- To evaluate National Health Service (NHS) financial costs attributed to the care of PLHIV, in comparison with matched HIV-negative controls.

- To evaluate which healthcare setting – hospital inpatient admissions, hospital outpatient, prescriptions or general practice incurs the greatest cost burden in HIV patients.

Methods

Data source

- Patients were selected from the Clinical Practice Research Datalink (CPRD) GOLD database, a routine primary care database in the United Kingdom comprising approximately 11 million patients.[4]

- CPRD GOLD captures data from approximately 10% of the UK general practice records and is representative of the UK as a whole. Approximately 60% of primary care practices participate in the Hospital Episode Statistics (HES) linkage scheme, by which their patient records are linked to inpatient and outpatient data throughout the NHS hospitals in England.[4,5]

Patient selection

- The study population was selected from permanently registered patients of acceptable research quality (as set by CPRD), who were eligible for the HES linkage scheme.

- Read codes (primary care) and ICD-10 codes (secondary care) were used to identify patients with a HIV diagnosis.

- The index date for PLHIV was the earlier of either a patient's incident diagnosis of HIV, or their first positive test result for HIV. For HIV-negative controls, their index date was set to the index date of their matched HIV case.

- Patients were matched at a ratio of 1:2 with HIV-negative controls by their age, gender, general practice (GP).

Analysis

- Baseline characteristics were calculated for PLHIV and their matched controls in 2004, 2010 and 2017.

- Costs were calculated for GP visits,[6] primary care prescriptions,[7] inpatient hospital admissions, and outpatient visits.[8]

- Costs are presented as cost per person year (PPY) for each of the visit types and by total cost for the years 2004, 2010 and 2017 (in GBP at 2016/2017 pay and prices).

- Mean and medians are presented for total costs for both PLHIV and matched HIV-negative controls.

- Costs of anti-retroviral (ARV) drugs were excluded from cost analysis due to the majority of ARVs being prescribed in secondary care and therefore unobservable to the available datasets.

Results

- The baseline characteristics are presented in Table 1.

Table 1. Baseline characteristics for PLHIV and HIV-negative controls

Year	2004		2010		2017	
	PLHIV	HIV-negative	PLHIV	HIV-negative	PLHIV	HIV-negative
N	730	1.460	1,256	2,512	502	1,004
Age, mean(sd)	37.5(11.7)	38.4(12.7)	39.2(12.1)	39.8(12.5)	40.7(12.2)	40.9(12.6)
Male, %	65.8	66.7	65.7	66.0	68.5	66.0

- The ratios of mean total cost for PLHIV compared with HIV-negative controls were 9.4:1, 2:1 and 1.3:1 for the three annual periods, respectively (Table 2).

- Mean component costs were also higher for PLHIV in 2017, excluding inpatient costs which were greater in the HIV-negative cohort. The highest mean cost was observed in 2004 with a mean inpatient cost of £3,986 for PLHIV.

- The total median costs for PLHIV were £740, £598, and £328 in years 2004, 2010 and 2017 respectively compared to £67, £125, and £139 for HIV-negative controls respectively.

Table 2. Mean cost of care PPY for PLHIV vs HIV-negative controls (£)

Year	Cohort	1° care	Prescription	Inpatient	Outpatient	Total
2004	HIV-negative	108	86	253	84	531
	PLHIV	267	130	3,986	630	5,013
2010	HIV-negative	143	106	266	176	692
	PLHIV	225	149	301	703	1,378
2017	HIV-negative	149	115	220	165	648
	PLHIV	164	139	72	493	867

Discussion & Conclusion

- **All respective costs were greater in PLHIV compared to the HIV-negative control group in all follow-up years, apart from inpatient costs for 2017.**

- **The marginal cost of managing PLHIV (excluding ARVs) converged markedly with that of the HIV-negative controls, during the 15 years preceding 2017, potentially reflecting improvements in HIV specialist care.**

Limitations

- Coding of HIV status may be underrepresented as PLHIV may choose to access care in other settings (e.g. GUM clinic) or to not disclose HIV status.

- Some patients once diagnosed with HIV may not have given consent for their GP to be informed, therefore these patients may not be identified as HIV patients.

- The highest mean cost was observed in 2004, however this may be inflated due to repeated occurrence of expensive treatments, such as dialysis.

References

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