

Contemporary Costs of HIV Health Care in the HAART Era

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BACKGROUND

Previous research showed HIV care is expensive. With the change in epidemiology of HIV and current therapies, new analyses are needed to evaluate trends in costs of care.

This analysis examines sociodemographic and clinical correlates of health care costs in a multistate sample of HIV patients in 2006.

METHODS

The HIV Research Network (HIVRN) is a consortium of 19 sites in the United States (U.S.) that provide primary and subspecialty care to HIV patients. We evaluated health care costs at 11 adult sites in 2006 (N=14,490). These sites are located in the Eastern (5), Midwestern (1), Southern (2), and Western (3) U.S. Overall sample size per year: N=14,490 in 2006

We conducted a cross-sectional review of medical records to assess inpatient days, outpatient visits, visits to emergency departments, and prescribed ARVs and OI prophylaxis medications.

Per-unit costs of care were based on Healthcare Cost and Utilization Project (HCUP) data for HIV inpatient care, discounted average wholesale prices for medications, and inflated cost estimates from the HIV Costs and Service Utilization Study for outpatient and emergency department care. Unit costs were \$2,014.66 for an inpatient night, \$221.08 for outpatient visit, and \$430.98 for ED visit.

Total costs of care were stratified by the median CD4 count obtained in 2006 (≤ 50 , 51-200, 201-350, 351-500, > 500 cells/mm³).

To examine demographic variations in costs of care, we estimated a multiple regression model that included gender, race/ethnicity, HIV risk factor (IDU versus other), age, and CD4 category. We calculated mean predicted costs for each demographic variable, adjusting for CD4 count and other variables in the model.

Table 1. Demographic and Clinical Characteristics

Characteristic	2006 N= 14,490 (%)
Gender	
Male	10,543 (71)
Age (years)	
18-34	2,511 (17)
35-44	5,578 (37)
> 45	6,863 (46)
Race/ethnicity	
White	3,920 (26)
Black	7,262 (49)
Hispanic	3,232 (22)
Other	526(4)
HIV transmission	
Non-IDU	11,557 (79)
IDU	2941 (20)
Median CD4 in 2006 (cells/mm³)	
<51	847 (6)
51-200	2,169 (15)
201-350	3,248 (22)
351-500	3,393 (23)
>500	5,283 (35)

Table 2. Total Costs of Care by CD4 Count

	CD4 Stratum (cells/mm ³)				
	≤ 50	51-200	201-350	351-500	>500
N	847	2,169	3,248	3,393	5,283
ARV Costs	\$9,327 (8,723 – 9,931)*	\$11,172 (10,286 – 11,518)*	\$10,416 (10,141 – 10,691)*	\$9,272 (9,009 – 9,536)	\$9,519 (9,321 – 9,717)
OI Prophylaxis Costs	\$928 (853 – 1,003)*	\$591 (543 – 638)*	\$221 (196 – 246)*	\$130 (112 – 148)*	\$92 (81 – 104)
Inpatient Costs	\$19,658 (16,736 – 22,579)*	\$7,994 (6,994 – 8,993)*	\$3,475 (2,972 – 3,976)*	\$2,000 (1,672 – 2,328)*	\$1,466 (1,269 – 1,662)
Outpatient Costs	\$1,364 (1,261 – 1,466)	\$1,405 (1,356 – 1,454)*	\$1,344 (1,307 – 1,381)*	\$1,269 (1,236 – 1,302)*	\$1,208 (1,184 – 1,232)
CD4 Test Costs	\$106 (101 – 111)*	\$117 (114 – 120)*	\$112 (110 – 114)*	\$109 (107 – 110)*	\$103 (102 – 105)
HIV-1 RNA Test Costs	\$250 (238 – 263)*	\$280 (273 – 287)*	\$268 (262 – 273)	\$260 (255 – 264)*	\$249 (245 – 253)
Total Costs	\$31,633 (28,682 – 34,584)*	\$21,559 (20,494-22,624)*	\$15,835 (15,255-16,414)*	\$13,040 (12,609-13,471)	\$12,638 (12,354-12,921)

Table 3. Multiple Regression of Total Costs (\$U.S)

Independent Variable	Coefficient (95% CI) ^a
Female	(reference)
Male	-289.45 (-958, 379)
White	(reference)
Black	-562.10 (-1294, 169)
Hispanic	618.41 (-239, 1476)
Other race/ethnicity	-494.36 (-2554, 1265)
IDU	1401.00 (648, 2155)*
Other risk groups	(reference)
Age 18-34	(reference)
35-44	2607.11 (1730, 3483)*
45+	4075.63 (3210, 4941)*
Median CD4 ≤ 50	(reference)
51- 200	-10452.00 (-11923, -8981)*
201-350	-16144.06 (-17545, -14743)*
351-500	-18823.68 (-20220, -17427)*
Above 500	-19328.84 (-20676, -17981)*
Constant	29,043.89

Note: Total costs exclude expenditures for ED visits. N= 14,940. R²=0.07.

a – Entries are regression coefficients, which represent the expected difference in costs versus the reference category. The constant is the expected cost for a white, female, non-IDU patient aged 18-34 with CD4 count below 50.

*-- p < .001

This study was supported by the Agency for Healthcare Research and Quality, National Institutes of Health, Health Resources and Services Administration, and Substance Abuse and Mental Health Services Administration. The views expressed in this article are those of the authors, and no official endorsement by the Agency for Healthcare Research and Quality or the U.S. Department of Health and Human Services is intended or should be inferred.

RESULTS

- Averaging over all CD4 strata, the mean annual total cost per person for HIV care in 2006 was \$15,745, [IQR \$6,227 to \$18,894]
- Average annual per-person costs of care were greatest for those with CD4 counts ≤ 50 cell/mm³ (\$31,633) and lowest for those with CD4 counts > 500 cells/mm³ (\$12,638).
- The majority of costs were attributable to medications, except for those with CD4 counts ≤ 50 cells/mm³, for whom inpatient costs were highest.
- After adjusting for CD4 count, predicted mean annual costs were significantly higher for IDUs vs. Non-IDUs (\$16,787 vs.\$15,385). Similarly, after adjustment for CD4, predicted values increased significantly with age, \$12,934 for those 18-34, \$15,541 for the 35-44 group, and \$17,010 for those 45 years or older.

CONCLUSIONS

- HIV health care in the U.S. continues to be expensive, with the majority of costs attributable to medications.
- Higher costs among patients with CD4 counts > 500 cell/mm³ demonstrate the effectiveness of maintenance HAART in increasing CD4 levels.
- With improved HIV survival and aging of the cohort, costs may increase and should be monitored in the future.

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