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Cost-Effectiveness of a Care Program for HIV/AIDS Patients Affiliated with a Health Insurer in Colombia, Comparing Three Health Care Providers Nationwide

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ABSTRACT

Background: In Colombia, HIV and AIDS constitute one of the major diseases of high cost to the health system, making necessary health risk management of patients with this disease through comprehensive health care programs with their respective evaluation of results. **Objective:** To evaluate the relative cost-effectiveness of a care program for patients with HIV/AIDS affiliated to a health insurer in Colombia, comparing their results in three Health care provider (HCP). **Methods:** The study population corresponded to a cohort of patients older than 18 years with HIV/AIDS and affiliated to a health insurer in Colombia during 2011 and 2012. A cost-effectiveness and cost-utility analysis of a health care program for this population was performed on the basis of a Markov model, in which quality-adjusted life-years (QALYs) and life-years gained were assessed. This analysis was conducted from the insurer perspective. The time horizon was life expectancy. A discount rate of 3% was

applied. **Results:** Drugs accounted for 80.54% of care costs. The average annual cost of patients in health state 5 was 3 times higher than that of patients in state 1. HCP A compared with HCP B generated an additional 1.53 QALYs, with a rate of incremental cost-effectiveness of \$2400 per QALY gained. HCP C showed a dominated behavior. The variables that most influence the uncertainty were the cost of HCP A in health state 5 (55.52%) and the cost of HCP B in state 3 (27.51%). **Conclusions:** HCP A is a very cost-effective option considering a threshold of 1 time the per-capita gross domestic product.

Keywords: AIDS, cost-benefit analysis, impact assessment health, program evaluation.

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Introduction

Globally, reducing the incidence of HIV and AIDS has been defined as a priority in health, and one of the main objectives of the Millennium Development Goals, given their impact on morbidity, mortality and quality of life, and sociocultural and economic aspects of the affected population [1,2]. The prevalence of HIV/AIDS in adults aged 15 to 49 years worldwide was estimated at 0.5% in 2012 [3], at 0.4% in the Latin American context in 2012 [4], and at 0.16% in Colombia in 2013 [5].

In Colombia, HIV and AIDS constitute one of the main high-cost diseases, given its chronicity, disease burden, impact on the demand for services and health technology, and high financial burden for patients, their families, society, and the General System of Social Security in Health [6,7]. It was estimated that about \$ 138 million (USD) health resources were invested in Colombia by 2011 in response to HIV and AIDS. Of these, 84.13%

were involved in the care and treatment of those suffering from the disease. This is equivalent to an average cost of \$803 per person per year with the disease, and nearly 3 times the annual premium per capita for the period (Capitation Payment Unit \$273.58 for 2011) [8].

Therapeutic advances in the treatment of this disease have improved patient outcomes and have extended their life expectancy to the extent that it is considered today as a chronic disease that can be managed with the intervention of avoidable outcomes [9,10]. Against this background and in an environment of health insurance, risk management has become necessary for the health of members with HIV/AIDS through the design and implementation of models of care with holistic and clinical disease management, including program development routes and clinical practice guidelines. These programs should, in turn, articulate both health professionals and service providers, promoting prevention and early diagnosis of comorbidities.

Conflicts of interest: The authors have indicated that they have no conflicts of interest with regard to the content of this article.

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Under these considerations, in 2011, a new model of care for these patients was implemented by the insurer using which this study was conducted, which preliminarily showed decreased hospitalization rates and associated costs for this pathology. To facilitate decision making, it was considered necessary to evaluate health outcomes of these interventions beyond analysis and monitoring of the behavior of costs and incidence of comorbidities, including differences among providers. Therefore, the aim of this study was to evaluate the cost-effectiveness of the program of care for patients with HIV/AIDS affiliated with a health insurer in Colombia, comparing the results of its management in three health care providers (HCP).

Methods

Field of Study and Target Population

In Colombia, the health insurance model called the General System of Social Security in Health seeks universal population coverage, with the state delegating insurers to pay a fixed annual premium per user (annual premium per capita), which seeks to ensure access through health care providers to a positive list of benefits defined by the government.

The system is divided administratively and financially into the contributory scheme and the subsidized scheme. The first addresses the population linked at work or retired and those who have the ability to pay, whereas the latter caters to people who do not have sufficient income and therefore need to be subsidized by the state [11].

The target population for this study was a cohort of 884 patients affiliated with a health insurer in Colombia in the contributory system, with confirmed HIV infection and/or AIDS diagnosis, age older than 18 years, and at least an annual measurement of CD4 count during the years 2011 and 2012. The cohort members were distributed for the attention and follow up of their pathology among three health care providers who evaluated in this analysis. These institutions were contracted by the insurer for the development of the model of care in seven cities of the country. The three institutions are distributed in different cities of the country as follows: HCP A in Bogotá; HCP B

in Barranquilla, Bucaramanga, and Santa Marta; and HCP C in Cartagena, Montería, and Sincelejo. According to the objectives of the study, they are considered the relevant alternatives to compare.

Program Description

Patients were admitted to the program of care in HIV/AIDS once the diagnosis was confirmed in primary care institutions. The program was designed by a model of standard care and develops equally in the three specialized health care providers (HCP A, HCP B and HCP C) through an interdisciplinary team of medical specialists in infectious diseases, general practitioners, nurses, nutritionists, psychologists, social workers, and dentists [12].

On admission, the patients are seen by the general practitioner who requests a pack of blood tests and refers the patients to their respective interventions and follow-up to each of the health service providers. Then, medical supervision is performed and according to laboratory results, the plan of care and the need for initiation of antiretroviral therapy (ART) is defined, wherein the patient receives medication immediately after medical consultation and before leaving the institution.

The patient is seen by the infectious disease specialist at least four times a year and receives additional specialist care when inadequate virologic or immunologic response to treatment is observed, or when the patient is a pregnant woman. Follow-up consultation is performed monthly by general practitioners and telephone tracking by technical support staff who perform both searching, catchment and induction to the demand for health services, as well as strengthening adherence to treatment. The relevant laboratories are performed once per semester. Patient and family education is led by the nurse, with the active participation of other team professionals.

Cost Description

The cost-effectiveness analysis assessed only direct medical costs. Drug treatment, diagnostic and therapeutic procedures, as well as hospital, outpatient, emergency, and home care costs were taken into account. Indirect costs were not considered. The cost of each care and service provided to every patient in the

Table 1 – Annual average cost and transition probabilities by HCP and health state, from 2011 to 2012.

Strategy	Cost (per state) (\$)	Initial health state 2011	Final health state 2012				
			5	4	3	2	1
HCP A	6359.45	5	0.30	0.37	0.33	0.00	0.00
	4031.92	4	0.07	0.42	0.43	0.04	0.04
	2538.70	3	0.02	0.03	0.41	0.41	0.13
	1792.30	2	0.00	0.01	0.07	0.39	0.52
	1749.80	1	0.01	0.01	0.04	0.11	0.84
HCP B	3728.11	5	0.26	0.47	0.26	0.00	0.00
	2745.30	4	0.12	0.42	0.38	0.08	0.00
	1745.96	3	0.04	0.12	0.58	0.16	0.11
	1374.39	2	0.00	0.00	0.37	0.58	0.05
	1995.42	1	0.01	0.00	0.11	0.30	0.57
HCP C	3050.04	5	0.00	0.50	0.33	0.17	0.00
	2086.18	4	0.20	0.30	0.30	0.20	0.00
	2765.97	3	0.00	0.18	0.38	0.29	0.15
	2336.19	2	0.00	0.08	0.32	0.39	0.21
	2054.56	1	0.00	0.03	0.03	0.24	0.70

HCP, health care provider.

*Annual average first half 2015 US \$1 = 2485.32 Colombian peso [13].

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