

**EXPERT REPORT JL/TB(B)**

**PRICE EVOLUTION OF ANTIRETROVIRAL DRUGS 1996 TO 2002  
MARYLAND REIMBURSEMENTS FOR MEDICAID PROGRAM**

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The Consumer Project on Technology (CPTech) has analyzed reimbursement data from the Maryland Medicaid program for 15 US FDA approved drugs used in the treatment of HIV/AIDS. The data were observed from 1996 to 2002. In each therapeutic class, prices increased over time despite competition from other medicines in the same therapeutic class.

The fifteen drugs are divided into three therapeutic classes, nucleoside reverse transcriptase inhibitors (NRTIs, or nucleosides), protease inhibitors, and non-nucleoside reverse transcriptase inhibitors (NNRTIs, or non-nucleosides). The NRTIs include zidovudine, didanosine, zalcitabine, stavudine, lamivudine and abacavir. The protease inhibitors include ritonavir, saquinavir, indinavir, amprenavir, nelfinavir and lopinavir. The NNRTIs include nevirapine, delavirdine and efavirenz. Prices are expressed in US dollars per day of treatment based upon standard treatment regimes.

In the NRTI class the mean price increase was 30%. The first drug in the class was AZT. The two least expensive drugs in the class were Didanosine (ddI) and Zalcitabine (ddC), two products that were invented by the NIH, and licensed to BMS and Roche. NIH insisted both drugs be introduced at prices lower than AZT. In 1995, the NIH terminated the enforcement of reasonable pricing provisions in licenses. BMS subsequently increased the price of ddI by 45 percent.<sup>2</sup> The most expensive product in the class is Abacavir, which is the only NRTI that can be used as the third drug in a HAART cocktail. With the exception of ddC, widely considered the weakest drug in the NRTI class, prices increased every year.

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<sup>1</sup> Iris Boutris and Yonathan Haregot contributed the research on Maryland Medicaid reimbursements.

<sup>2</sup> The US government has rights in key patents in four drugs (ddI, ddC, d4T and Abacavir) in this class, and provided significant research subsidies for all six.

<b>Table 1: Price evolution of NRTIs in US\$ from 1996-2002<sup>3</sup></b>								
Daily price in USD								
Drug/Year	1996	1997	1998	1999	2000	2001	2002	Price increase
Zidovudine	8.84	8.85	8.89	9.17	9.71	10.20	10.99	24%
Didanosine	5.78	6.05	6.47	6.88	7.30	7.66	8.38	45%
Zalcitabine	6.46	6.43	6.71	6.69	6.9	7.14	7.66	19%
Stavudine	7.24	7.57	8.08	8.74	9.26	9.72	10.32	43%
Lamivudine	7.11	7.15	7.62	8.15	8.3	8.66	9.36	32%
Abacavir	N.A.	N.A.	N.A.	11.01	11.14	11.67	12.57	14%

Table 2 provides data for 6 Protease Inhibitors (PIs). In the protease inhibitor class the mean price increase was 16%. From year to year, prices for individual products were either level or they rose (*with the exception of just three cases where prices fell by an insignificant 1 cent, 2 cents and 7 cents*), despite entry of new products in 1997 (Nelfinavir), 1999 (Amprenavir) and 2000 (Kaletra). By 2002, four highest priced products were priced in a tight band of \$19.91 to \$22.03 per day.

<b>Table 2: Price evolution of Protease Inhibitors in US\$ from 1996-2002<sup>4</sup></b>								
Daily price in USD								
Drug/Year	1996	1997	1998	1999	2000	2001	2002	Price increase
Ritonavir (Norvir)	19.73	19.73	19.77	19.83	19.86	N.A.	N.A.	-
Lopinavir+Ritonavir (Kaletra)	N.A.	N.A.	N.A.	N.A.	19.99	19.98	20.76	5%*
Indinavir (Crixivan)	13.32	13.39	13.32	13.68	14.37	15.57	16.17	21%
Nelfinavir (Viracept)	N.A.	17.14	17.15	18.36	18.34	18.77	19.91	16%
Saquinavir (Fortovas)	N.A.	17.81	18.31	19.00	19.63	20.40	22.03	24%
Amprenavir (Agenerase)	N.A.	N.A.	N.A.	18.98	19.21	20.19	21.80	15%

\*Abbott replaced Ritonavir(Norvir) with Lopinavir+Ritonavir(Kaletra) in 2000. The 5 percent change is for Norvir-->Kaletra.

<sup>3</sup> Maryland Medicaid Reimbursement data (Cite)

<sup>4</sup> Maryland Medicaid Reimbursement data (Cite)

In the Non Nucleoside Reverse Transcriptase Inhibitors (NNRTI) class, the mean price increase was 26%. Delavirdine, the cheapest drug, increased in price by 36% whereas efavirenz, the most expensive drug, increased in price by 7%. Efavirenz was introduced into the market in 1999 at a hefty 43 percent higher price than nevirapine. Efavirenz prices increased by 90 cents by 2002. Despite the fact that efavirenz prices were higher, it became the best selling drug in the class. *After entry* of efavirenz in the NNRTI class, nevirapine prices rose by \$1.76 per day, or 20 percent.

**Table 3: Price evolution of NNRTIs in US\$ from 1996-2002<sup>5</sup>**  
Daily price in USD

Drug/Year	1996	1997	1998	1999	2000	2001	2002	Price increase
Nevirapine	7.68	7.70	8.02	8.52	8.96	9.58	10.28	34%
Delavirdine	N.A.	6.96	7.20	7.92	8.64	9.00	9.48	36%
Efavirenz	N.A.	N.A.	N.A.	12.18	11.97	11.97	13.08	7%

<sup>5</sup> Maryland Medicaid Reimbursement data (Cite)