Costs of Antiretroviral Therapy

Chapter 3 of the text present summary information on the unit cost of antiretroviral therapy (ART), which is then used to construct the projection scenarios that appear in subsequent chapters. This annex gives the background information which was used to construct table 3.9 on the costs of antiretroviral drugs and table 3.10 on the costs of treating opportunistic illnesses, both of which appear in chapter 3. The cost of antiretroviral drugs depends on the exact drugs used, the dosage of each, and the exact price of each drug in Thailand. Since all of these vary across patients, across physicians, and over time, they are subject to continual revision. Chapter 4 analyzes the sensitivity of the book's major results to large changes in the prices of the drugs. Although we did not consider the possibility that the choice of drugs might also change, table B.1 presents the 2004 prices of the individual drugs in Thailand and thus allows the reader to consider the potential effect that specific changes might make to unit costs of treatment.

Successful ART means postponing most of the costs of treating opportunistic illnesses until the time when ART no longer works, a time that comes sooner for some patients than for others. We assume that the patient would fact the same opportunistic illnesses when treatment fails as he or she would have faced had treatment never been initiated. Thus the financial savings achieved by postponing treatment of opportunistic illnesses for a single patient consists of the difference in the present discounted value of treatment between the time ART is initiated and the time ART fails. This savings is larger if the cost of opportunistic illness treatment is larger or if the discount rate is larger. Tables B.2 and B.3 in this annex present data on the

distribution of the various opportunistic illnesses within Thailand. Based on these relative frequencies, table 3.10 presents the available data on the cost of treating opportunistic illnesses for the typical Thai patient. These estimates are then used to ensure that projections of the future cost of ART in Thailand properly net out the savings from postponing the treatment of opportunistic illnesses.

One of the most important cost elements in ART is the cost of the CD4 test. A survey of Thai physicians practicing ART, conducted by HIV-NAT for this study, asked the physicians for information on the cost to their patients of CD4 tests. Figure B.1 shows that, despite the fact that NAPHA was more than a year old, there was still substantial variation in the prices paid for these tests. While we have used a moderate value for the cost of a CD4 test in our projections, the Thai government should be aware that some patients are being requested to pay much more or to forego this essential element of good ART.

Table B.1 Costs of Branded and Generic Antiretroviral Drugs in Thailand, November 2004

ARV drugs	Strength (mg) and Daily dose	Cost per patient/month				Cost per patient/year			
		Branded drugs		Generic drugs		Branded drugs		Generic drugs	
		Baht	US$	Baht	US$	Baht	US$	Baht	US$
NRTI									
abacavir (ABC)	300 × 2	10,080	252.0	n.a.	n.a.	35,480	887.0	n.a.	n.a.
didanosine (ddI)	100 × 4	1,033	25.8	50	1.3	12,400	310.0	600	15.0
lamivudine (3TC)	150 × 2	6,048	151.2	600	15.0	72,576	1,814.4	7,200	180.0
stavudine (d4T)	30 × 2	4,146	103.7	210	5.3	49,752	1,243.8	2,520	63.0
stavudine (d4T)	40 × 2	4,326	108.2	270	6.8	51,912	1,297.8	3,240	81.0
zidovudine (AZT)	300 × 2	4,644	116.1	1,020	25.5	55,728	1,393.2	12,240	306.0
AZT + 3TC	(300 + 150) × 2	8,340	208.5	1,500	37.5	100,080	2,502.0	18,000	450.0
NNRTI									
efavirenz (EFV)	600 × 1	2,319	58.0	n.a.	n.a.	27,828	695.7	n.a.	n.a.
nevirapine (NVP)	200 × 2	1,666	41.7	900	22.5	19,992	499.8	10,800	270.0
NtRTI									
tenofovir (TDF)	300 × 1	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
PI									
indinavir (IDV)	400 × 6	4,860	121.5	n.a.	n.a.	58,320	1,458.0	n.a.	n.a.
nelfinavir (NFV)	250 × 10	9,344	233.6	n.a.	n.a.	112,128	2,803.2	n.a.	n.a.
ritonavir (RTV)	100 × 2	2,542	63.6	n.a.	n.a.	30,504	762.6	n.a.	n.a.
saquinavir (SQV)	100 × 10	9,840	246.0	n.a.	n.a.	118,080	2,952.0	n.a.	n.a.
indinavir + ritonavir (IDV/r)	400 × 4	3,240	81.0	n.a.	n.a.	38,880	972.0	n.a.	n.a.
lopinavir + ritonavir (LPV/r)	(133.3 + 33.3) × 6	12,692	317.3	n.a.	n.a.	152,304	3,807.6	n.a.	n.a.
saquinavir + ritonavir (SQV/r)	(1000 + 100) × 2	11,964	299.1	n.a.	n.a.	143,568	3,589.2	n.a.	n.a.

Table B.1 Continued

ARV drugs	Strength (mg) and Daily dose	Cost per patient/month				Cost per patient/year			
		Branded drugs		Generic drugs		Branded drugs		Generic drugs	
		Baht	US$	Baht	US$	Baht	US$	Baht	US$
First line (MOPH guidelines)									
3TC + d4T + NVP	(150 + 30 + 200) × 2	11,860	296.5	1,200	30.0	142,320	3,558.0	14,400	360.0
3TC + d4T + NVP	(150 + 40 + 200) × 2	12,040	301.0	1,320	33.0	144,480	3,612.0	15,840	396.0
d4T + 3TC + EFV	(40 + 150) × 2 + 600 × 1	12,513	312.8	2,579	64.5	150,156	3,753.9	30,948	773.7
AZT + 3TC + EFV	(300 + 150) × 2 + 600 × 1	10,006	250.2	3,819	95.5	120,072	3,001.8	45,828	1,145.7
AZT + 3TC + NVP	(300 + 150 + 200) × 2	17,684	442.1	2,400	60.0	212,208	5,305.2	28,800	720.0
d4T + 3TC + IDV/r	30/40 + 150 + 800/100	13,434	335.9	3,500	87.5	161,208	4,030.2	42,000	1,050.0
AZT + 3TC + IDV/r	300 + 150 + 800/100	21,032	525.8	4,740	118.5	252,384	6,309.6	56,880	1,422.0
Second line (HIV-NAT)									
IDV + RTV + EFV	800 + 100 + 600	9,721	243.0			116,652	2,916.3		
IDV + RTV + AZT + 3T C	800 + 100 + 200/300 + 150	8,902	222.6			106,824	2,670.6		
Second line (WHO guideline)									
ABC + ddI + LPV/r		22,822	570.6			273,864	6,846.6		
ABC + ddI + SQV/r	(300 + 400* + 1000/100) × 2	22,094	552.4			265,128	6,628.2		
TDF + ddI + LPV/r									
TDF + ddI + SQV/r									

Source: Bureau of AIDS, Tuberculosis, and Sexually Transmitted Infection, MOPH 2004; Duncombe 2004; GPO 2004; MSF 2004.
Note: A daily dose of didanosine in combinations is 400 milligrams once daily for patients who weigh more than 60 kilograms and 250 milligrams once daily for those who weigh 60 kilograms or less.
n.a. = not available.

Table B.2 Prevalence of Opportunistic Infections of AIDS Patients at Siriraj Hospital, 2002–04

Type of infection	*Prevalence (%)*
Tuberculosis	29.3
Pneumocystis carinii pneumonia	18.7
Cryptococcal meningitis	15.7
Cytomegalovirus infection	6.3
Lymphoma	6.3
Toxoplasmosis	5.7
Salmonellosis	6.0
Cryptosporidium	5.3
Other	5.0

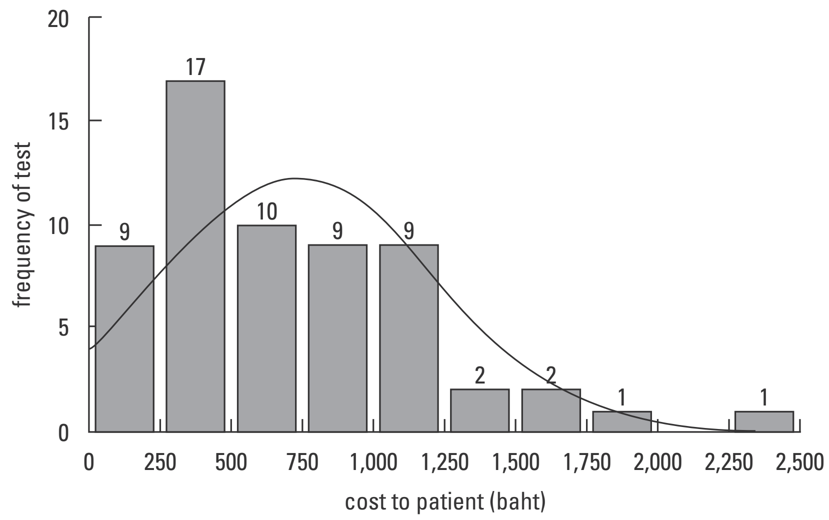
Source: Ratanasuwan 2004.
Note: Other includes histoplasmosis, mycobacterium avium complex, PML, candida esophagitis, and rhodococcosis.

Table B.3 Opportunistic Infections Presented among 282 WHO Study Participants at 32 Public Hospitals, 2002–04

Type of infection	*%*
Tuberculosis	34.7
Pneumocystis carinii pneumonia	19.0
Cryptococcal meningitis	15.8
PPE	13.7
Toxoplasmosis	3.2
Oral candida	4.2
Other	8.4
No data	3.2

Source: Supakankunti and others 2004.
Note: Other includes penicilosis, chronic fever, and herpes zoster.

Figure B.1 Cost of CD4 Counts



Source: HIV-NAT survey of Thai Physicians 2004.