
Introduction

International Context and Experience

If left untreated, infection with the human immunodeficiency virus (HIV) is almost universally fatal. Globally, HIV is now the major cause of years of potential life lost and the most common cause of death attributed to an infectious disease. In 2005 alone, 3.1 million people died from AIDS (acquired immunodeficiency syndrome) globally, and 4.9 million people became infected with HIV, bringing to 40.3 million the number of people living with the virus across the world (UNAIDS 2005).

The advent of antiretroviral therapy (ART) in the late 1980s began a revolution in the management of HIV that can be seen as analogous to the use of penicillin for treating bacterial infections in the 1940s. The aim of antiretroviral treatment strategies is suppression of viral replication, and successful treatment leads to immunologic restoration, slowing or halting of disease progression, prevention of drug resistance, and improvement in quality of life. ART is not a cure, but successful use of ART halts the decline in immune deficiency and prevents disease progression and death. ART has radically changed the outlook for those who can pay for it or can use well-resourced health care systems.

Until recently, poor infrastructure and lack of resources were considered major obstacles to the availability of ART in poor countries and among marginal and vulnerable populations. However, growing evidence suggests that provision of ART is both feasible and effective in resource-poor settings. Pilot studies in Africa (Côte d'Ivoire, Kenya, Malawi, Senegal, and Uganda), involving more than 2,000 participants,

and one broad-based public health program in Brazil, treating more than 100,000 people, demonstrate the successes of ART:

- significant improvements in weight, CD4 cell count, and viral load
- reductions in the incidence of opportunistic infections
- significant improvements in the quality of life.

Evaluation of the ART program in Brazil in 2002 indicated that during its first seven years 360,000 hospital admissions were avoided, at a savings of US\$2.2 billion over the costs of supplying ART; the prevalence of TB was reduced by 80 percent; mortality was reduced by 50 percent; and, following an HIV diagnosis, the median survival increased from 18 months to 58 months (Galvão 2002; Levi and Vitoria 2002). Those results are impressive, and they suggest that it is possible to deliver ART effectively on a large scale in resource-constrained settings.

Of the estimated 40 million adults and children infected with HIV worldwide, at least 5 million to 6 million people would immediately benefit from ART. However, only 700,000 people (approximately 12 percent of the estimated total who urgently need ART) are currently receiving access to therapy on an ongoing basis (WHO 2004a). Thailand, like Brazil, is now at the vanguard of resource-limited countries that are seeking to provide ART as the standard of care to large numbers of people with progressive HIV. As of February 2005, some 52,593 people living with HIV/AIDS (PHAs) in Thailand had received ART through the National Access to Antiretroviral Program for People Living with HIV/AIDS (NAPHA), and approximately 8,000 other PHAs are estimated to have access to ART through the Social Security Scheme (SSS) of the Royal Thai government. The government's objective was to reach a target of 80,000 PHAs by the end of 2005 and a target of 138,000 PHAs by 2007.

The Hope of ART

The first case of AIDS in Thailand was reported in September 1984. Since then, more than 1 million Thais have been infected with HIV and, of those, more than 400,000 have died. In 2004, some 572,000 Thais were estimated to be living with HIV. Of people living with

HIV, some 50,000 develop serious illness, and a similar number die every year (Thanprasertsuk and others 2004). HIV disease is now the leading cause of premature death in Thailand.

The bulk of this HIV-associated morbidity and mortality falls disproportionately on men and women in their prime productive years: approximately 78 percent of HIV/AIDS cases are in the 25- to 39-year-old group (Thanprasertsuk and others 2004). The human, economic, and social costs of this burden are huge. At the national level, AIDS has reversed the declining trend in national mortality rates, has reduced years of life expectancy, has led to an increase in the number of orphans (expected to reach 200,000 by 2005), and has resulted in sizable losses in labor productivity and years of labor (Phoolcharoen, Posyachinda and others 2004a). At the family level, HIV/AIDS is associated with a high burden of illness, rising medical costs, forgone income, and a need for family members—often elderly parents—to take on the burden of caring for their ill relatives. PHAs also have to confront widespread stigmatization and discrimination, which sometimes extend to their children and families (see box 1.1) (Mohr 2002b).

Box 1.1 Suchada’s Story: “ART Is a Great Contribution to Lessen Discrimination”

When, in 1996, I found out that I was infected, I resigned from my job fearing that people would find out that I was HIV positive. I divorced and moved with my daughter to [an]other province where nobody knew me. We were really alone in this cruel world. It was so hard that I wanted to kill myself, but I could not because I didn’t want my child to suffer even more. Four years later, I started to have serious [opportunistic infections] and looked for treatment. Fortunately, I met a doctor who told me about ART and suggested that I should go back to my hometown, where I could join ART free of charge.

It was not easy, because I did not want to disclose myself. I had to contact doctors and nurses privately. Everyone in the community suspected that I was infected. I was discriminated [against], and even my daughter, who is not infected, was discriminated [against]. I could not earn my living, because nobody would buy anything I made to sell in the market. Then I met some PHAs and [nongovernmental organization workers] who gave me good counseling and information. I was encouraged to [im]prove myself. Thanks to ART, my physical appearance is back almost to normal and my health has improved.

I believe that if there were no stigma, no discrimination, HIV/AIDS should be even less serious than many other chronic illnesses. Discrimination is worse than HIV itself. Without discrimination, PHAs are already more than 50 percent “cured.” ART is a great contribution to lessen discrimination.

Source: Phongphit 2004; personal interviews with PHAs.

Box 1.2 Kamman's Story: The "Miracle" of ART

I am 29 years old. In 2001, I was diagnos[ed] with HIV. Prior to this, I had been suffering [from] strong headaches, vomiting, and a stiff neck. I also lost weight and started to lose my sight. I left my job and went back home to the northeast. In the provincial hospital, I was advised not to start with [antiretroviral drugs] till I was cured of my OI [opportunistic infection]. In June 2003, I started urinating urine mixed with blood and was advised to go to Khon Kaen University Hospital, where I was told I could start with [antiretroviral drugs]. I had to go to the hospital every week and had to travel a distance of over 200 kilometers and also pay for my [drugs]. Several months later, I was told by a doctor in my province that I could have [medication] also here without paying for it.

It is a surprise and a miracle for many, and also for myself, that with almost all possible OIs, I can still survive and have a life of this quality. My health has improved remarkably since the start of ART six months ago. My weight has increased from 58 kilograms to 75 kilograms, and my CD4 has increased from 0 to 99 [cells per cubic millimeter]. From [being] almost blind, I have recovered part of my sight, and I can now help myself in almost everything and help work at home. Now I can even eat, sleep, and live like ordinary people.

Source: Phongphit 2004; personal interviews with PHAs.

The Royal Thai government and Thai society have demonstrated a strong commitment to providing comprehensive care and support to PHAs, but only recently have they been able to provide ART to large numbers of people with symptomatic HIV (see chapter 2). The availability of a domestically produced triple-drug combination (GPO-vir) at affordable prices (about B 1,200 or US\$30 per month) has opened the door for many PHAs who could previously not afford ART and has allowed the Thai Ministry of Public Health (MOPH) to roll out a large-scale campaign to provide ART in more than 840 hospitals to nearly 52,600 PHAs as of February 2005.¹

The advent of ART has radically changed the outlook for those living with HIV/AIDS, bringing hope, increased quality of life, reduced stigma, and less discrimination to many PHAs. In the words of an HIV-positive 29-year-old man, ART is a "miracle" (see box 1.2). According to another PHA, with ART she has "recovered my will to live" (see box 1.3). However, as the voices of these PHAs illustrate, using ART is also difficult and painful. As illustrated by box 1.4, many

Box 1.3 Parichart's Story: "Before ART, I Did Not Want to Live Any Longer"

I am a widow with a nine-year-old son. I started to take ART in 2001 and initially had to travel a distance of 120 kilometers to Bangkok every month and pay B 5,000. My parents, who are not very well off, had to sell their old car and were also considering selling off a plot of land to buy ART regularly. Now I take ART from the community hospital of my hometown, and I don't have to pay for it.

After [I began] taking ART, my CD4 has increased from 0 to 165 [cells per cubic millimeter], and within six months my weight increased from 42 kilograms to 55 kilograms. I have also been cured of the different OIs (including [tuberculosis], cryptococcal meningitis, [Pneumocystis carinii pneumonia], herpeszoster, etc.) I was suffering with.

Before ART, I did not want to live any longer; now I have recovered my will to live again. I would like to help other PHAs and share my experiences with them. They should know that someone seriously ill, with all kind of OIs like me, can survive. They should have hope, join ART, and take care of their health.

Source: Phongphit 2004; personal interviews with PHAs.

PHAs on ART report serious negative side effects and consequences (Phongphit 2004):

- mental and physical side effects
- negative impact on their physical appearance
- drug resistance
- other difficulties.

Overview of the Report

This report is intended to inform the Royal Thai government and Thai society at large about the full range of benefits, costs, and consequences likely to result from the government's decision to expand public provision of ART through NAPHA and to help design the most effective policies for achieving treatment benefits, promoting prevention, and maintaining financial sustainability.

The report team has structured its analysis around a complex epidemiological model, modified to take into account large-scale provision of ART. This model, the Asian Epidemic Model (AEM), is based

Box 1.4 Alternatives to ART

Samran's Story: Drug Resistance

I believe I was infected with HIV in 1987. Four years later, after having lost all hope, I was taken to a temple outside Bangkok, where I received some herbal medicine and gradually regained my health. I went back to Chiang Mai to take other herbal medicine and joined a self-help group of PHAs, where we learned to take care of our health by a "holistic" method, including nutrition, recreation, physical exercise, meditation, herbal medicine, and treatment of OIs.

In 1997, I took AZT and ddI as a member of a trial group. However my health deteriorated. I had OIs on account of drug resistance. After a break of 4 to 5 months, I changed to *Taiomon* from India. In 2001, I started with GPO-vir, and then a [protease inhibitor] group. It did not help, and my health worsened. I had developed drug resistance. Since I stopped ARV, my health is much better. I do not have any OI[s] now, but my CD4 has not gone down below 300 [cells per cubic millimeter], and my viral load is gradually increasing. I have developed drug resistance because I did not have consistency in taking ARV. I think that, although we have ARV, we should not forget to take care of our health holistically.

Vasna's Story: "If I could go back, I would not join ART"

Ten years ago, while undergoing a voluntary HIV testing and counseling for pregnant women, I found out that I was HIV positive. By January 2003, although I had no OI, I felt tired when walking upstairs, and my CD4 was 100. On [a] doctor's advice, I decided to go on ART.

A year and a month later, I am rather confused about ART. I do not understand why my weight went up from 75 kilograms to 99 kilograms, and I [am] disturbed by the fact that the fat growth is misplaced. If I could go back, I would not join ART till my health would be at its worst point. Because once you take [ART], you have to take the drugs every day of your life without any exception. I would recommend [to] anyone that, as long as his health is still not that bad and [he] has no OI, even if his CD4 is low, he should better take the various alternatives available to keep us healthy before deciding to go for ART. ART should be the last answer to his life.

I think [it] is good that we have ART. Most of my friends and persons I work with and work for have a much better life today thanks to ART. Besides undesired side effects [such] as the ones happening to me, we do not know whether and how long we would have ART, and [if] drug resistance occurs, who could tell us what is next?

Source: Phongphit 2004; personal interviews with PHAs.

on available behavioral and transmission data and captures the complexity of HIV risk in Thailand by modeling the behavior of eight separate risk groups. The previous version of this model did not include the effects of ART on the longevity of people with HIV, on their likelihood of transmitting HIV, or on the development and spread of drug-resistant strains of the virus (Thai Working Group on HIV/AIDS Projection 2001). The new version of the AEM, developed for this report, allows for the following factors:

- detailed modeling of early recruitment on the basis of voluntary counseling and treatment (VCT) of asymptomatic patients (at higher CD4 counts) to increasingly substitute for late recruitment of symptomatic patients through the health system (typically at much lower CD4 counts)
- different treatment arms (purely public, augmented public, or private)
- progression into second-line therapy (Brown and Peerapatanapokin 2004a).

Using the AEM, we present the estimated effect of alternative policy scenarios on the following range of indicators that are important to public health and to policy makers:

- reduced numbers of HIV-infected persons
- lengthened lives of HIV-infected people
- reduced costs of hospitalization for opportunistic illnesses
- spread of resistant strains of the virus
- budgetary costs to the government
- both potentially positive and negative effects on prevention activities.

Because the long incubation period of HIV means that the consequences of today's policy choices will play out over decades, all analyses are for a projection period of 25 years. We present the estimated costs and benefits of alternative scenarios and show the sensitivity of the result to the rate at which future costs and benefits are discounted. We draw the model parameters from the Thai literature and experience and, where Thai-specific parameters are not available, from the international

AIDS literature and expert opinion. Sensitivity analysis tests the robustness of the results to alternative assumptions about these parameters.

Because the effect of a policy choice can be defined only in comparison to what would have happened in the absence of that choice, the foundation for the analysis is a baseline projection of the future course of HIV/AIDS treatment if the Royal Thai government had neither introduced its expanded NAPHA nor subsidized the production and sales of low-cost generic ART (GPO-vir) through the Government Pharmaceutical Organization (GPO). In other words, the baseline scenario assumes no significant public role in the provision or financing of ART, or it assumes a very limited role, such as the MOPH's previously existing, very small, voluntary program, which operated through the clinical research network and reached only some 2,100 people.² Although alternative baseline scenarios could have been chosen, the report team deemed this baseline to be the cleanest and simplest to interpret (see chapter 4 for the details of the baseline).

Against this baseline projection, we analyze the effect of the government's NAPHA under several alternative versions of its implementation. The policy options considered for NAPHA explore, on the one hand, ways to facilitate earlier recruitment into ART by strengthening and stimulating demand for VCT for HIV and, on the other hand, ways to encourage adherence through PHA groups, use of counselors, conditional transfers, and other demand-side programs.³ This range of policy options for NAPHA is summarized in table 1.1.

Table 1.1 Policy Scenarios for NAPHA

<i>Encourage VCT and early recruitment into ART</i>			
		No	Yes
Encourage adherence through demand-side incentives such as PHA groups, accompagnateurs, and conditional transfers	No	NAPHA (D1): Current implementation of NAPHA (recruit mainly symptomatic HIV-infected persons through the public health system)	VCT (D2): Earlier recruitment through VCT of people with higher CD4 counts, without improved adherence
	Yes	Adherence (D3): Improved adherence without earlier recruitment (keep current recruitment of symptomatic HIV-infected persons through the public health system)	VCT and adherence (D4): Improved adherence and earlier recruitment (recruit earlier through VCT of people with higher CD4 counts)

Source: Author.

We compute the projected HIV epidemic under each of these scenarios, and then we estimate the effect of each scenario on the range of key indicators described above. Indicator outcomes under these scenarios are compared against the baseline of no ART, as discussed earlier. We then compute cost-effectiveness measures of the alternative policy options.

The report is organized into seven chapters. Chapter 2 describes the dynamics and patterns of the HIV epidemic in Thailand and summarizes the Thai policy response. Chapter 3 presents a brief technical discussion of the clinical management of HIV/AIDS, including challenges faced in the clinical management of ART; its effect on survival, infectivity, and transmission; and its socioeconomic effect. Chapter 3 also synthesizes the information available on the costs associated with ART—treatment of opportunistic infections and VCT—to both the household and the public health care system. That information is then used to estimate the costs and benefits of ART under different scenarios. Chapter 4 presents an analytical framework for the evaluation of ART treatment policy and presents the estimated effect of current NAPHA policy on such treatment. The framework computes the cost-effectiveness of current policy and discusses its fiscal and financial implications. Chapter 5 expands this analysis by evaluating the costs and benefits of the alternative policy scenarios (see table 1.1 for scenarios D2–D4). Chapter 6 carries out some sensitivity analyses on key biological and behavioral parameters and on assumptions about the evolution of prices for second-line therapy. Finally, chapter 7 concludes and presents the team’s recommendations. Technical details and data are synthesized in the annexes.

Notes

1. See NAPHA website from the Bureau of AIDS, TB, and STI at MOPH (2005) for the PHA figures: <http://www.aidsthai.org/care>. The figure on PHAs cited is accessible on this website.

2. See chapter 2 and the background papers by Gold and others (2005) and Thanprasertsuk and others (2005) for a detailed description of the evolution of the government’s ART program.

3. For example, by using paid adherence counselors with little medical training (accompagneurs), the Partners in Health program in Haiti has had substantial adherence (Farmer and others, 2001a, 2001b, 2003).