ASIAN DEVELOPMENT BANK

POVERTY IMPLICATIONS

OF HIV/AIDS IN THE PACIFIC

ABBREVIATIONS

ADB	–	Asian Development Bank
ART	–	antiretroviral therapy
ARV	–	antiretroviral
BNPL	–	basic needs poverty line
FPL	–	food poverty line
FSM	–	Federated States of Micronesia
GDP	–	gross domestic product
GNI	–	gross national income
HDI	–	Human Development Index
HPI	–	Human Poverty Index
PLWHA	–	person living with HIV/AIDS
PDMC	–	Pacific developing member country
PNG	–	Papua New Guinea
SPC	–	Secretariat of the Pacific Community
STI	–	sexually transmitted infection
UNAIDS	–	Joint United Nations Programme on HIV/AIDS
WHO	–	World Health Organization

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CONTENTS

I.   INTRODUCTION

A.   Background

Poverty has decreased dramatically throughout most of the Asia and Pacific region. From 1990 to 2000 the number of people living in poverty across the region fell by 165 million (ADB, 2004a). However, economic growth in India and the People's Republic of China has driven much of the reduction in headline poverty figures. Other parts of the region, most notably the Pacific, have not witnessed a similar spectacular fall in poverty. Isolation, erosion of human capital, youth unemployment, inequitable growth, and political instability are challenges that Pacific states need to overcome if they are to reduce poverty and achieve development goals shared internationally.

As Pacific countries struggle with these challenges, HIV/AIDS is posing an additional threat to poor communities. Papua New Guinea (PNG) is already experiencing severe social and economic upheaval due to HIV/AIDS. As the situation in southern and eastern Africa has demonstrated, the insidious damage that an expansion of the HIV/AIDS epidemic could inflict on Pacific countries is all too apparent—especially when the presence of similar risk factors in the Pacific, such as the high rate of sexually transmitted infections (STI) and low condom usage, are considered.

Much of the literature on the socioeconomic effects has focused on national or macroeconomic indicators. However, a recent study (Martin, 2004) on south Asian and Mekong region countries by the Asian Development Bank (ADB) and Joint United Nations Programme on HIV/AIDS (UNAIDS) has shown that the epidemic will have a major impact on the poor and vulnerable. The numbers of Pacific households affected, as well as people likely to fall into poverty as a result of the spread of HIV/AIDS, have not been defined clearly. Quantifying this risk should spur policy makers into action—sooner rather than later.

The overall objectives of this study are to quantify the poverty impacts of an escalating HIV/AIDS crisis in the Pacific, and to raise awareness and increase understanding among key decision makers. The specific objectives include:

- Reviewing the poverty situation in the Pacific, and assessing the relative merits of selected poverty measurement methodologies;

- Presenting expenditure and income effects associated with HIV/AIDS, focusing on health spending and the reduction in income for people living with HIV/AIDS (PLWHA) or by their caregivers;

- Assessing household impacts of the HIV/AIDS epidemic by simulating the impact of HIV/AIDS-related expenditure and income effects on households with PLWHA;

- Estimating the aggregate impact of HIV/AIDS on poverty between 1987 and 2020, using the Fiji Islands and PNG as case studies; and

- Recommending interventions that need additional resources and those that are adequately supported, in light of the poverty assessment and targeting of HIV/AIDS expenditures.

B. Approach and Methodology

Much of the early literature on the socioeconomic consequences of HIV/AIDS has focused on the effects that increased adult mortality has on labor productivity and household savings, and the repercussions on national economic growth. Theoretical studies in Africa have estimated substantial economic damage, including (i) 1.5% reduction per year in national growth rates in Botswana (Greener et al, 2001), (ii) 1.4% lower annual gross domestic product (GDP) growth rate in Lesotho (World Bank, 2000), and (iii) 0.7% decline in per capita GDP across 50 African countries during the 1990s (Bonnel, 2000). Likewise, a 2002 modeling study by the Centre for International Economics in PNG estimated that an escalation of the epidemic in that country would cut real GDP by as much as 7.5% in 2020.

Effects of HIV/AIDS on the Household. As the epidemic has spread, the microeconomic burden of HIV/AIDS has received more attention. Household surveys throughout Asia and Africa demonstrated that poverty was a precondition that facilitated the spread of the virus. For example, Bloom et al (2002) noted that poverty put individuals at greater risk of contracting the virus, because lower levels of education and reduced access to information diminished the likelihood that the poor would adopt preventative measures.

Importantly, households falling into poverty have been associated directly with AIDS-related deaths within the family. In Asia, surveys of HIV/AIDS-affected and unaffected households have been conducted in northern Thailand (Kongsin, 2003; Pitiyanon et al, 1997). These showed the devastating impact of the virus on household incomes and expenditures. These types of investigations have not been conducted in the Pacific, although they are needed to design appropriate support for affected households.

Figure 1: Impact of AIDS on Income and Expenditures (Non-Health and Health)
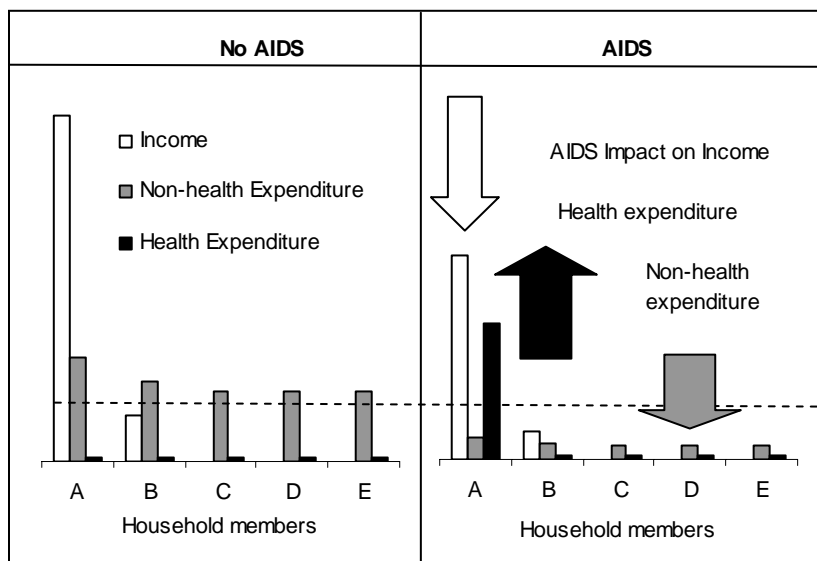
A strong association between HIV/AIDS and poverty globally is undeniable, as more than 95% of those infected with HIV live in developing countries (UNAIDS, 2005). This report examines how HIV/AIDS pushes households in the Pacific into poverty—specifically how the potential decrease in income, increase in spending on health care, and consequent reduced expenditure for food and other basic needs are calculated for households in the richest to poorest socioeconomic segments in PNG and Fiji Islands. These countries account for more than 90% of all cases in the Pacific. The methodology for simulating the poverty ramifications from an escalating epidemic is derived from Martin (2004). Key elements of the method are described in the remaining part of this section.

Modeling the Economic Impacts of HIV/AIDS on Households. For modeling purposes, households in each economic segment were split into five socioeconomic quintiles. The quintile containing the highest income earners is referred to as Q5, while the quintile with the poorest households is referred to as Q1. The relevant characteristics of each quintile include population size, people per household, numbers of households per quintile, average income per household, and average expenditure per person and household. The Appendix outlines these characteristics for PNG and for Fiji Islands.

The income and expenditure characteristics of an average household are estimated with and without a HIV/AIDS-affected household member. Figure 1 shows that when two family members (denoted A and B) earn an income, spending is spread across health and non-health items, with some money being saved. The magnitude of income and expenditure change varies for each quintile. The wealthiest quintile (Q5) in Fiji Islands and PNG spends more on health and non-health expenditures.

If a family member contracts HIV, AIDS is likely to develop within 5–7 years. As a result, overall household income will decline, particularly if the principal wage earner is the one who has developed the disease. Other family members might have to devote time to caring for the sick family member, reducing their own potential for paid employment. Few studies have tracked the income implications of HIV/AIDS on a household over an extended period. The decrease in income in affected households is probably most severe in the 24 months before the death of a family member and the following year. During this period, the time devoted to care, as well as the lack of capacity for employment by the affected individual, is most acute. A study (Bachmann and Booysen, 2003) in southern Africa has investigated the temporal dimensions of HIV/AIDS on household economics.

Figure 1 shows the impact of AIDS on income, as well as health and non-health expenditures. During early phases of the disease, expenses are incurred for the treatment of headaches, diarrhea, and fungal infections. As the immune system becomes more compromised, income is diverted for expensive antiretroviral (ARV) drugs and associated antiretroviral therapy (ART)—where this type of health care can be afforded—or the affected family member succumbs to the complications of AIDS. Even in cases where ARV treatment is not used, considerable resources typically are used in palliative care to reduce the pain and suffering of an AIDS patient. To cover ART or other medical costs, assets might be sold, money borrowed from formal or informal sources, and/or other non-health related expenditures modified.

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Clearly, this easily can force households below the basic cost of living. A minimum package of food items to meet nutritional requirements is a threshold known as the "food needs line", while other basic expenditures for schooling and accommodation constitute the "basic needs line". Members of the population who live on expenditures below these thresholds often are considered to be living in poverty.

Even after the AIDS-affected family member succumbs to the disease and health expenditures decrease, the reduction in household income from losing a household member can take time to normalize. Further, families might be left with debts to service, pushing households into a health-induced poverty trap. The income and expenditure implications of AIDS for average households in each quintile are modeled using household survey data, reports, and expert opinion where available. Sources of data and gaps in the current information base for key variables are outlined in the Appendix for the PNG and Fiji Islands simulations.

Modeling the Impact of HIV/AIDS on National Poverty. The numbers of households to fall into poverty as a result of AIDS is modeled by projecting HIV incidence in each quintile in the Fiji Islands and PNG. High and low epidemic growth projections outlined in this report were utilized. The incidence for each quintile is combined with household impact data to determine the aggregate or national numbers of people falling into poverty. Poverty projections take into account the dynamic relationship between poverty and income growth. Moreover, a range assumptions underpinning the analysis have been made for GDP growth, cost inflation, population growth, and income distribution.

C.   Organization of the Report

The initial sections of this report outline the dimensions of poverty within the Pacific. The methods used to quantify poverty are examined, along with the performance of selected Pacific developing member countries (PDMC) where poverty data exist. Fiji Islands and PNG are highlighted as case studies to examine increased HIV/AIDS cases and poverty levels.

The HIV/AIDS situation in the Pacific then is provided in context for the poverty modeling analysis. The report explains how this impacts incomes, as well as health expenditures and non-health expenditures, for households across the five income quintiles in Fiji Islands and PNG. It quantifies the number of households in each quintile falling into poverty, and aggregates the data corresponding to HIV infection projections for each country.

Key findings from the study are highlighted in the Conclusions section. Recommendations are made from the perspective of national governments and development partners. A broad range of assumptions and data have been used to quantify poverty impacts for the case studies. As many of these parameters are subjective, they carry a degree of uncertainty. To ensure transparency, the main assumptions are outlined in the Appendix that follows the References section of the report.

II.   POVERTY IN THE PACIFIC

The reduction in poverty across Pacific countries has been uneven. All governments of the region, along with other development partners, share the goals of enhanced economic growth and equitable development. This shared vision is best enshrined in the adoption of the Millennium Development Goals.

Box 1 summarizes the status of poverty in terms of the number of people living on income below that required to meet basic needs for selected PDMCs. Although poverty reduction is a cornerstone of social development programs, the measurement of poverty is difficult—conceptually and in practice.

ADB has established poverty partnerships with 11 PDMC governments to define poverty better, monitor progress towards reducing poverty, and develop and integrate appropriate strategies for reducing hardship into country development plans (ADB, 2004b). Defining and measuring poverty across a vast geographic region has proven to be a significant barrier.

The lack of a standard definition of poverty has been a fundamental problem. Generally, poverty is measured using per capita GDP, international poverty lines, and/or nationally defined poverty lines. The relative merits of these poverty indicators are described for the Federated States of Micronesia (FSM), Fiji Islands, Kiribati, PNG, Samoa, and Tonga, as these countries have a suite of comparable indicators. These indicators were adopted and modified for the impact of HIV/AIDS on poverty in the Fiji Islands and PNG case studies. The instruments for measuring poverty, and the performance of selected PDMCs in addressing poverty, are described in the next section.

> **Box 1: Millennium Development Goal: Eradicate Extreme Poverty and Hunger**
>
> The incidence of absolute poverty, based on the number of people living below $1 a day, has been estimated at 20% for the Marshall Islands (1999) and 40% for Vanuatu (1998). Other measures of poverty incidence have been derived from national basic needs poverty lines using surveys. The most recent available survey data suggest that about 12% of the Cook Islands population (1998), 30% in Federated States of Micronesia (1998), 26% in Fiji Islands (1991), 50% in Kiribati (1996), 20% in Samoa (2002), 23% in Tonga (2001), and 29% in Tuvalu (1994) live below nationally defined levels of basic needs consumptions and expenditure. Notably, most indicators from Pacific developing member countries suggest that poverty levels have increased.
>
> Sources: ADB, 2004b; ADB, 2006.

A.   National Income Levels

Per Capita Income. Across the Pacific, per capita income varies a great deal. Among the selected countries studied in this report, Fiji Islands had a relatively high per capita gross national income (GNI) in 2003 of $2,280, while PNG had a low per capita GNI of $480 that year. ADB (2004b) noted that income poverty levels can be measured to some extent using this indicator. However, this generates an average for the national population, and does not reveal any details about the distribution of income and the extent of poverty. In addition, these forms of national income accounting often do not include non-monetary production, which could be substantial in subsistence-based economies of the region. Figure 2 shows the trends in per capita GNI for the selected Pacific countries.

Fiji Islands has one of the highest per capita GNIs in the region, and has demonstrated relatively strong income growth. Nominal per capita GNIs of most countries in the region have remained relatively stable, despite substantial aid inflows during the early and mid-2000s. The economies of Kiribati and to a lesser extent FSM depend on external aid support. Poor economic performance has combined with population growth and accelerating inflation to reduce real per capita GNI in PNG since 2000. As ADB (2004b) noted, comparing national income accounts from this region with those from other regions where subsistence production is less important can prove difficult. Other factors, including external remittances and external trust fund earnings, also confound international comparisons (ADB, 2004b). At the aggregate level, however, the economic performance of PDMCs has not mirrored other parts of the Asia and Pacific region.

Figure 2: Per Capita GNI in Selected PDMCs
($)
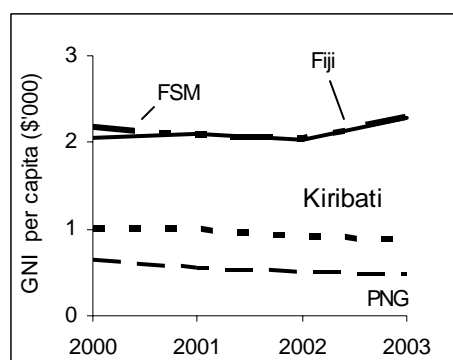
GNI = gross national income, PDMC = Pacific developing member country.
Source: World Development Indicators.

Table 1: Per Capita GNI and Aid Flows in the Pacific
($)

Country	2000	2001	2002	2003
FSM				
Aid (million)	101.6	137.6	111.7	114.9
GNI per capita	2,170	2,080	2,110	2,280
Fiji				
Aid (million)	29.1	26.0	34.1	51.1
GNI per capita	2,050	2,000	2,040	2,280
Kiribati				
Aid (million)	17.9	12.4	20.9	18.4
GNI per capita	990	990	900	880
PNG				
Aid (million)	275.4	203.1	203.3	220.3
GNI per capita	650	560	500	480
Samoa				
Aid (million)	27.4	43.1	37.3	33.0
GNI per capita	1,390	1,370	1,430	1,500
Tonga				
Aid (million)	18.8	20.3	22.3	27.5
GNI per capita	1,660	1,500	1,440	1,510

GNI = gross national income.
Sources: http://devdata.worldbank.org/data-query/, SPC PRISM www.spc.int/prism, and ADB statistics. www.adb.org

With per capita and aggregate economic growth in the region not as vigorous as in eastern and southern Asia, there is concern that many countries will not achieve poverty reduction targets,

and more people could fall into poverty as income distribution becomes increasingly disparate. How income is being shared among the economic groups is explained using absolute and national poverty lines.

B.   Absolute Poverty Rates

The United Nations commonly determines the proportion of a community living in poverty by estimating the number of people living on less than $1 or $2 per day. The percentage of the population living on less than $1 or $2 per day is often referred to as the head count ratio. Table 2 shows the proportion of the populations in selected PDMCs living below $1 per day.

Despite the shortcomings of per capita GNI as a measure of poverty, a strong correlation is shown between low-income countries and the percentage of the population living below $1 per day. Higher-income countries, as denoted by GNI per capita in Table 1, have fewer people living below $1 per day. Direct comparisons between countries and GNI estimates in Table 1 cannot be made, because the surveys used to determine household incomes and expenditures were undertaken across different years. For Table 2, the years for the national surveys in each country are in parenthesis.

Table 2: Poverty Indexes in the Pacific

Country	$1 per day (head count index %)	Food Poverty Line (head count index %)	National Basic Needs Poverty Line (head count index %)
FSM (1998)	5	—	28
Fiji (1991)	5	10	26
Kiribati (1996)	38	—	50
Papua New Guinea (1996)	31	17	38
Samoa (2002)	6	8	20
Tonga (2001)	4	22	22
Vanuatu (1998)	40	—	40

FSM = Federated States of Micronesia, GNI = gross national income.
Source: Cited in ADB (2004b). Available: http://www.adb.org/Statistics/pdf/Basic-Statistics-2005.pdf

Table 2 shows that high proportions of the populations of Kiribati (38%) and PNG (31%) were living in poverty in the late 1990s. Vanuatu also had a large proportion of the households (40%) living in poverty in 1998. PNG, the Pacific country with highest number of HIV cases, also had a large number of people living in absolute poverty.

As absolute poverty lines fail to consider the local costs of subsistence, they might not reflect accurately the number of people living in poverty in a specific country or region, particularly if the costs of living are high. To account for this, national poverty lines typically are constructed to identify the number of people unable to purchase basic food and needs items to live with some level of comfort.

C.   National Poverty Lines

National poverty lines take into account the costs of purchasing food and other basic needs within a country. Two thresholds typically are estimated: the food poverty line (FPL) and the basic needs poverty line (BNPL). The FPL is an estimation of the cost of purchasing the minimum daily intake of calories required for an individual's survival (about 2200 calories per

day). The BNPL accounts for essential nonfood items such as housing, transport, utilities, school fees, clothing, and contributions to the church and other social obligations (ADB, 2004b) required by households in the lowest income quintile (Q1). The correlation between national, per capita GNI, and absolute poverty is moderate, although some variation occurs. In PNG and Kiribati, large segments of the population are estimated to live below national and absolute poverty lines, while also having low per capita national incomes.

Table 3: Poverty Lines Per Person (2002 prices)

Country	FPL ($ per year)	BNPL ($ per year)	Cost of 100 Calories ($)
Fiji (2002)	400	676	0.325
Kiribati (1996)	411	468	0.351
Papua New Guinea (1996)	156	260	0.130
Samoa (2002)	405	624	0.341
Tonga (2001)	312	728	0.323

BNPL = basic needs poverty line, FPL = food poverty line.
Source: ADB, 2004b.

Conversely, countries such as Tonga and to a lesser extent Samoa have few people living on less than $1 per day, but many living below the FPL and BNPL. The relatively high cost of food (Table 3) helps explains some of the differences in national and absolute poverty across the Pacific. PNG and Fiji Islands, the countries with the highest HIV caseloads, are at opposite ends of the poverty spectrum in the Pacific. PNG has one of the lowest per capita GNIs, along with the highest proportion of people living below absolute and national poverty lines. Fiji Islands, on the other hand, has only 5% of its population living on less than $1 per day.

Based on the relative merits of the poverty estimation methods and poverty situation in the Pacific, national FPLs are used in the simulation exercise as they take into account country-level factors and more accurately estimate poverty incidence. Before undertaking the simulations, a brief review of the HIV situation in the Pacific, along with projections of the epidemic in Fiji Islands and PNG, is provided.

III.   HIV/AIDS IN THE PACIFIC

PNG and the Fiji Islands have the most HIV cases among Pacific island states. The Cook Islands, FSM, Kiribati, Nauru, Palau, Republic of the Marshall Islands, Samoa, Solomon Islands, Tonga, Tuvalu, and Vanuatu also have recorded HIV cases, though much fewer than PNG. Current statistics might not reflect reality, however, due to inadequate reporting. The high levels of STIs, low condom usage, and numerous sexual partners in some parts of the Pacific might increase the epidemic's momentum.

A.   Poverty and Risk of Infection

Poverty is also a risk factor in the spread of the disease. The poor, who frequently lack access to education, often do not have the information to make informed decisions about prevention, and often lack access to health services.

The 1996 Demographic and Health Survey in PNG was the first survey to generate information about knowledge and behavior in relation to AIDS in that country. Some important trends and observations were made at a time when the virus was less prevalent than it is today. The 1996 survey noted that two thirds of women had heard of AIDS. Of the women who had heard of AIDS, 18% said they did not know any method to avoid HIV infection. Notably, a great deal of misinformation was found in the poorer areas, such as in the Highlands (8% misinformed). For example, practices such as kissing were thought to spread the disease, and the use of condoms to prevent transmission was not widely understood.

On the other hand, a number of respondents knew about methods of prevention. In the case of sexual contact, a significant proportion of people knew that the risk of infection decreased by having fewer sexual partners and avoiding sex workers.

Table 4: Human Development and Poverty Indexes in the Pacific

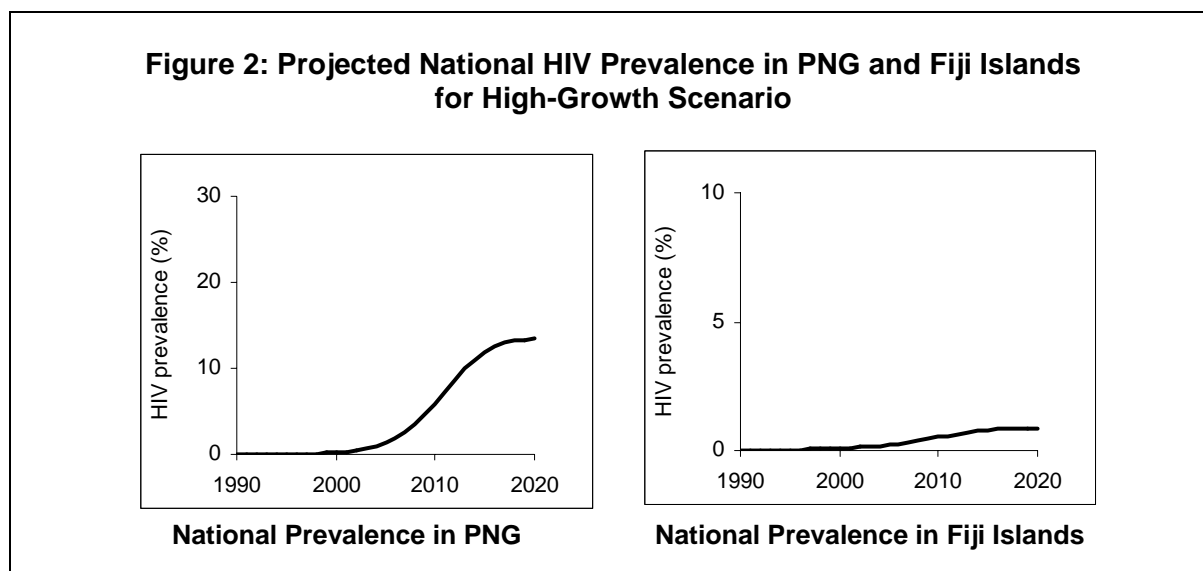| Country	HIV Prevalence 2004 Cases	Human Development Index Value	Human Development Index Rank	Human Poverty Index Value	Human Poverty Index Rank
Cook Islands	2	0.822	2	6.1	2
Fiji Islands	182	0.667	3	8.5	4
Kiribati	46	0.515	10	12.6	8
Marshall Islands	10	0.563	9	19.5	9
FSM	25	0.569	8	26.7	10
Nauru	2	0.663	4	12.1	7
Palau	8	0.861	1	10.8	6
Papua New Guinea	10,184	0.314	14	52.2	14
Samoa	12	0.590	6	8.6	5
Solomon Islands	5	0.371	13	49.1	13
Timor-Leste		0.395	12	49.0	12
Tonga	13	0.647	5	5.9	1
Tuvalu	9	0.583	7	7.3	3
Vanuatu	2	0.425	11	46.4	11

FSM = Federated States of Micronesia.
Source: UNDP data for 1998, cited in ADB (2004b)

In the Pacific, HIV prevalence is highest in PNG, which has the lowest HDI and worst human poverty index. Despite extensive literature implicating poverty as a risk factor in HIV transmission, the regional correlation between prevalence and poverty is relatively weak as Fiji, which has the third highest HDI, has the second most people living with HIV (Table 4). As the disease spreads within these countries and more infected individuals become symptomatic, life expectancy will deteriorate, along with other human development indices.

B.   Key HIV Projections

The intensity of the epidemic has been difficult to predict. Hence, epidemic growth scenarios have been employed throughout the socioeconomic impact analysis. These scenarios are used to determine household impacts and the number of households falling below national FPL as a result of HIV/AIDS infection.

PNG. Approximately 10,000 people in PNG were documented with HIV as of mid-2004, although the actual number might be much higher. Current and future prevalence scenarios within the general population, as well as high-risk subpopulations of sex workers, sex worker clients, and men who have sex with men, were formulated using the UNAIDS estimation and projection package. Under the high-growth scenario in PNG, an estimated 13.3% of 15–49 year olds will be HIV positive in 2020. A lower-growth scenario generated prevalence of around 8% in the same population in 2020. Figure 2 shows the higher-growth prevalence trajectory for PNG and Fiji Islands.

Figure 2: Projected National HIV Prevalence in PNG and Fiji Islands for High-Growth Scenario

National Prevalence in PNG

National Prevalence in Fiji Islands

PNG = Papua New Guinea.
Source: Estimates from this analysis

Fiji Islands. The official number of confirmed HIV cases in Fiji Islands was reported to be 182 in 2004. However, the Fiji Islands' Ministry of Health estimates that this figure represents only about one third of the actual cases (UNAIDS, 2005). Like PNG, high- and low-growth scenarios were projected for this country, generating a prevalence estimate for 2020. Under the high-growth scenario, a prevalence of 0.87% among 15–49 year olds was projected for 2020. The low-growth scenario produced a prevalence rate about half that level. In the absence of HIV

infection patterns related to socioeconomic status data, each quintile is anticipated to account for the same burden of HIV infection in PNG and Fiji Islands.[1]

IV.   HOUSEHOLD IMPACTS OF HIV/AIDS

The previous section reviewed the methods of quantifying the relationship between poverty and HIV/AIDS in the Pacific. In this section, the impact of HIV/AIDS on households is simulated for five income quintiles in Fiji Islands and PNG. The effect of HIV/AIDS on household income, health expenditure, and non-health expenditure is calculated to determine whether households fall below the FPL in each county. Martin (2004) noted that the coping strategies of AIDS-affected households might include falling back on savings, disposing of assets, borrowing, and changing household living arrangements and structures.

A.   Impact on Household Income and Expenditure

Household Income. For the first 3–5 years following HIV infection, an affected household member might not know of his or her HIV status, and could continue working until AIDS develops and reduces productivity. Following this phase, the symptoms could render this person incapable of working; or the HIV-infected person and family members could be stigmatized and lose their jobs. During this period of illness, the loss of income and the cost of caring for a family member might impoverish a household.

Studies in Asia document reduced levels of household consumption and malnutrition following HIV infection and AIDS impact. For example, the household impact study by Pitayanon et al (1997) found HIV/AIDS-related deaths were primarily in households dependent on agriculture and laboring. The loss of income from the deceased family member was the largest of the economic costs of an HIV/AIDS-related death. Further, many of the PLWHA were employed, but lost their jobs because they were too weak to work, or encountered stigmatization and discrimination in the workplace.

Oriente (2005), Dennis (2003), and Borovnik (2003) have described the role of Pacific seafarers in supporting extensive family networks within countries, such as Kiribati. Peteru (2002) has outlined the vulnerability of this mobile group to HIV infection. However, an investigation of the impact of HIV/AIDS on household economies within the region has not been conducted. If more members of this economically important, yet vulnerable, group were to become infected, significant numbers of households in the Pacific could fall into poverty, as these people are an important source of income in economies reliant on seafarer and other mobile groups, such as military and police.

In the absence of Pacific data, a study from Africa (Bachmann and Booysen, 2003) is used to quantify the impact of HIV/AIDS on household incomes. In this simulation, the average household income in each quintile is assumed to decline by 30% over 3 years. This period

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[1] This means that each quintile will account for 20% of the national burden of disease.

comprises 2 years when the AIDS patient is severely ill, and 1 additional year when the household is still bearing the income loss of the deceased.[2]

After this period, coping mechanisms—such as younger or elderly household members seeking employment—are assumed to rebuild household income to the same level as before the terminal phase of the disease. The country-specific implications of reduced income are presented after medical expenditures and poverty ramifications are outlined.

Increased Medical Expenditure. Non-heath expenditures typically decrease in AIDS-affected households as more resources are dedicated to disease treatment. The magnitude of this decrease depends on the types of coping strategies employed by affected households. A range of studies in Asia have identified options that include reducing education spending, borrowing money, leveraging family labor, and selling land and other assets.

For example, the impact survey of 116 households in Thailand conducted by Pitayanon et al (1997) found HIV/AIDS medical costs were about 6 months of the average household income. Heath-related spending follows the trajectory of disease progression. Initial palliative care expenditures focus on the treatment of diarrhea, skin rash, cough, headache, fever, shortness of breath, nausea, and mild pain.

As the immune system becomes more compromised, opportunistic infections, such as tuberculosis, pneumonia, toxoplasmosis, oral thrush, and septicemia, require treatment. Suwanagool et al (1997) indicated that the leading causes of admission of AIDS patients at Siriraj Hospital in Thailand during the early 1990s were tuberculosis, cryptococcosis, P. carinii pneumonia, diarrhea, and toxoplasmosis. The average duration of admission was 14 days, at $500 per visit.

Although ARV drugs and testing costs have declined in recent years, procurement costs still vary considerably throughout the region. For the purposes of this report, ARV costs are assumed to average $850 per patient per year. A recent study in Thailand calculated the overall cost of ART to be $842–$6,960 per patient per year (World Bank, 2005), depending on the complexity of drug regime. Most patients would require treatment at the lower end of this cost scale. For the purposes of this study, it is assumed that ART extends the life of PLWHA by 2–3 years beyond what would be expected if AIDS was to progress in the absence of treatment.

Only households in the two wealthiest quintiles in PNG and Fiji Islands are assumed to be able to afford this form of treatment. Coverage of drug treatment throughout the country faces a number of challenges, including infrastructure, trained staff, and affordability. McBride and Bardford, (2004) provide an overview of these issues. Since drug therapy costs $850 per year, the annual private health expenditure per person in an affected house increases dramatically. For example, health expenditure per person in 2001 was about $3 in PNG. Based on an average household size of four people, annual health expenditure (spread over household members in the AIDS-affected household) would increase from $3 to nearly $216 per person during the treatment period.

Figure 3: Total and Private Health Expenditure by Country in 2001

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[2] Bachmann and Booysen (2003) compared households with an HIV-infected member and unaffected households in South Africa. Households with any ill members during the previous 6 months had incomes that were independently as much as 26% lower than households without any illness. At follow-up, 6–12 months after household illness, the income difference between affected and unaffected houses was less than 10%.
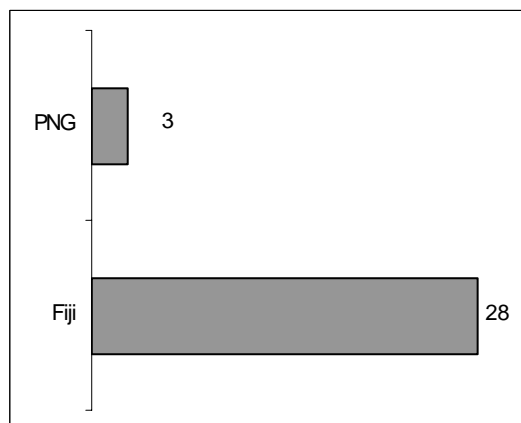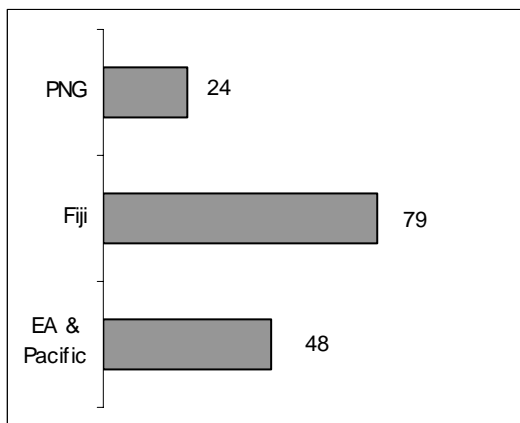
Total Health Expenditure ($ per person)   **Private Health Expenditure ($ per person)**

EA = East Asia , PNG = Papua New Guinea.
Source: World Health Organization, 2005.

Within the other three income quintiles, AIDS patients are assumed to have access to opportunistic infection treatment for, among others, tuberculosis, cryptococcosis, P. carinii pneumonia, diarrhea, and toxoplasmosis. For AIDS patients within these socioeconomic quintiles, annual health expenditures per patient during the 2 years of AIDS-related illness are assumed to average $100–400 in PNG and $300–400 in Fiji Islands. Even spread over a four- to five-person household, this increased expenditure is substantial given the low incomes of households in these quintiles.

This estimate assumes that only one household member is HIV-infected, a phenomenon typically observed in the early stages of a concentrated epidemic. The costs of many AIDS-related medical treatments are decreasing due to the production of cheaper generics, as well as changes in legislation governing patents and intellectual property. In the absence of specific information about future ARV prices, the cost of treatment is assumed to remain constant over the projection period.

Martin (2004) noted that differences in financing mechanisms (prepayment schemes versus out-of-pocket payments), and the proportion of health spending financed directly by households, have important implications for the potential poverty impact of health expenditure. Private health expenditure is $3 per person in PNG and $28 per person in the Fiji Islands. Figure 3 demonstrates that private expenditure as a proportion of total expenditure is higher in PNG, and the bulk of expenditures is financed out of pocket (WHO, 2005).

In 2001, according to WHO (2005) estimates, out-of-pocket financing covered 100% of private health expenditures in Fiji Islands and 83% in PNG. In these countries, when a household member requires expensive treatment, the household must bear the majority of costs.

B. Poverty Simulations for PNG and Fiji Islands

Decreased income and escalating out-of-pocket health care expenditures are the key drivers that displace non-health-related spending on food and other basic needs—and can plunge households into poverty.

Income, health expenditure, and non-health expenditure are simulated for typical households within each quintile under "with AIDS" and "without AIDS" scenarios. The results are reported by
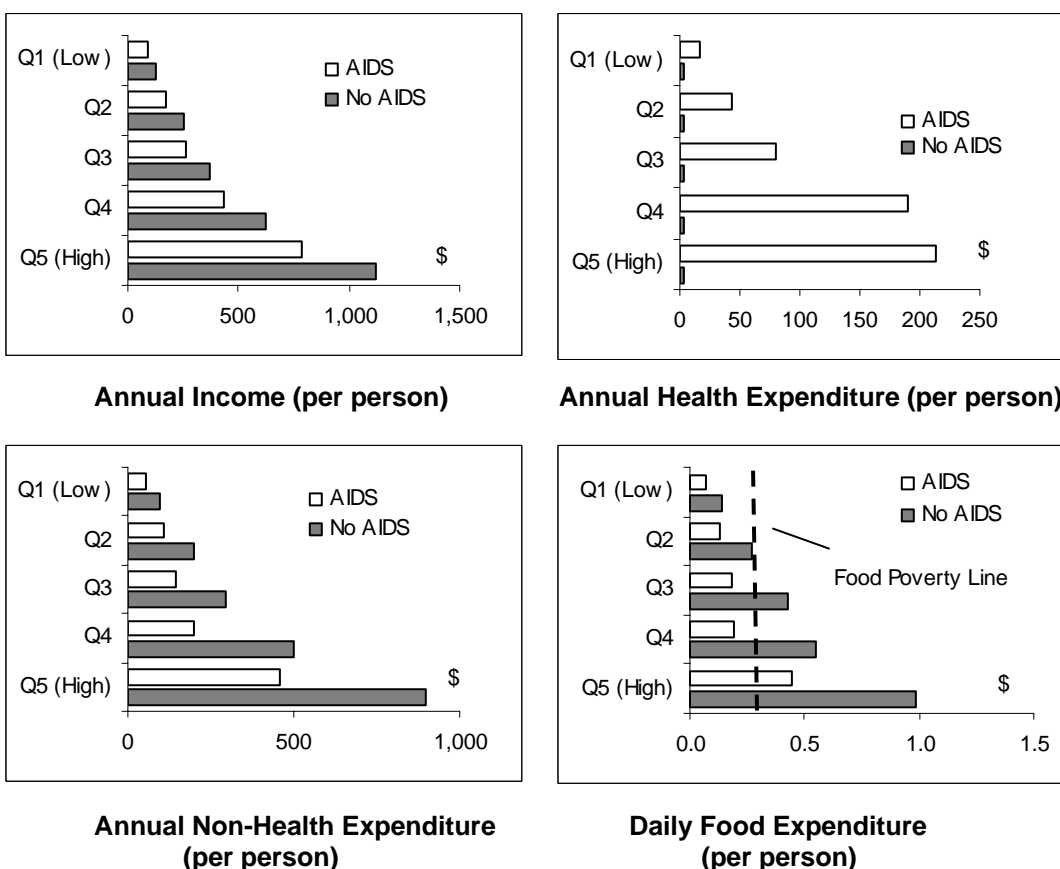
consumption quintile, where Q1 is the poorest quintile and Q5 is the richest quintile. The reduction in non-health expenditure is compared to food expenditure needs for each country—the FPL. Assumptions relating to the FPL are provided in the Appendix.

PNG. The average per capita income in PNG is around $500 per year. To determine per capita income across various quintiles, the poorest quintile (Q1) is assumed to have a 5% share of national income, while the richest (Q5) is assumed to have about half.

Figure 4 shows average income per person for each quintile, based on these assumptions. The complete set of assumptions used to derive these estimates is in the Appendix. Annual income associated with each income class, as well as the reduction per person due to the impact of AIDS, also is displayed in Figure 4

Without AIDS, annual out-of-pocket health expenditures average about $3 per person in PNG. With the onset of AIDS, health expenditures dramatically increase. Wealthier quintiles are assumed to devote more resources to caring for household members afflicted with the disease. The assumptions relating to health care expenditure in AIDS-affected households also are in the Appendix.

Figure 4: Per Person Income and Annual Expenditures (Health and Non-Health) in AIDS- and Non-AIDS-Affected PNG Households by Income Quintile

Annual Income (per person)

Annual Health Expenditure (per person)

Annual Non-Health Expenditure (per person)
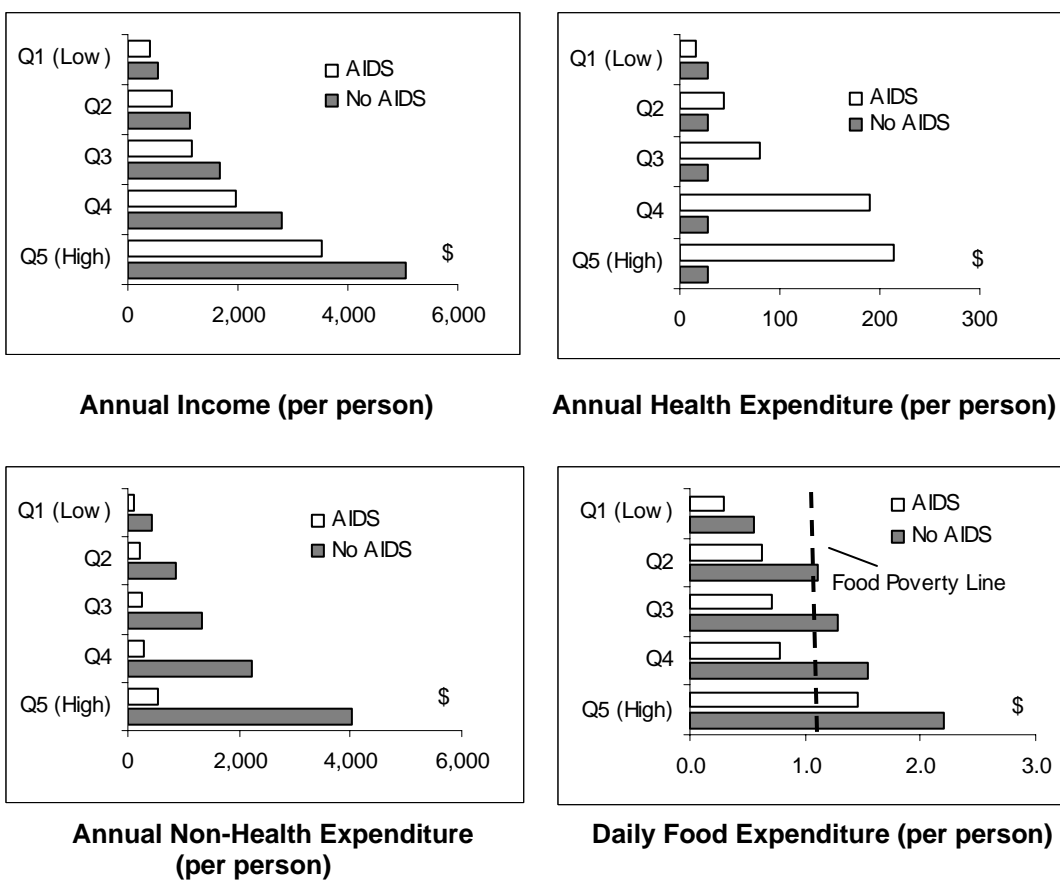
Daily Food Expenditure (per person)

PNG = Papua New Guinea
Source: Consultant estimates (for year of AIDS death)

The increase in health expenditure is so severe for households within the Q2–Q4 when a family member requires AIDS treatment that daily food spending falls below the FPL. This fall is a combined affect of decreased income and increased health expenditure. Although not as costly as ART, palliative care costs borne by lower-income households are significant enough to deprive them of the resources required to meet food need expenditures.

Fiji Islands. Income and expenditure effects for households with a PLWHA also were simulated for all quintiles in Fiji Islands. A decrease in household income and a rise in household health-related expenditures associated with HIV/AIDS would push households in the poorer quintiles below the food needs poverty line.

Figure 5: Per Person Income and Annual Expenditures (Health and Non-Health) in AIDS- and Non-AIDS-Affected Fiji Islands Households by Income Quintile

Annual Income (per person)

Annual Health Expenditure (per person)

Annual Non-Health Expenditure (per person)

Daily Food Expenditure (per person)

Source: Consultant estimates (for year of AIDS death)

The decline in non-health expenditures is not severe enough in the wealthiest quintile to force households into food-related poverty. Many, however, might have to forfeit basic needs, such as transport and school expenses, to meet the increases in health expenditure associated with caring for a family member with HIV/AIDS.
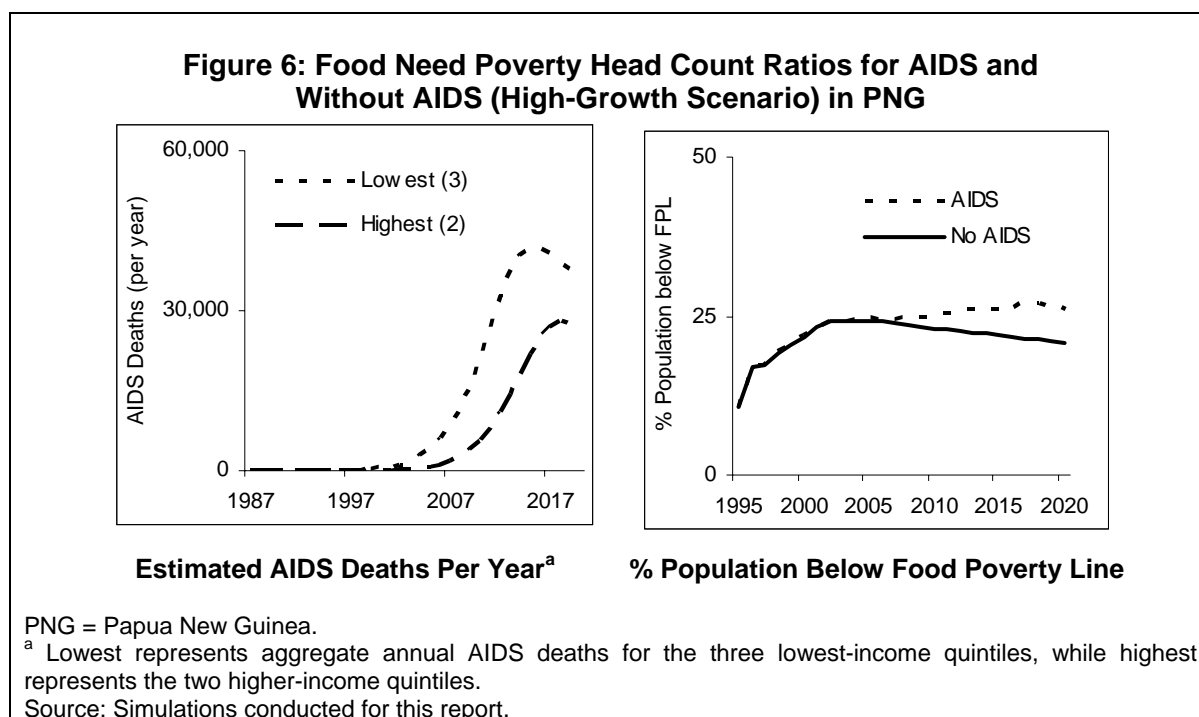
C.   Implications for Poverty Head Count

The previous section highlighted the severe effect of HIV/AIDS on households within all quintiles. Of particular importance for the poverty impact simulation, however, is that HIV/AIDS would force households within Q2–Q4 in Fiji Islands below the national FPL. Similarly, households within Q2–Q4 in PNG would be pushed below that country's food poverty threshold. The poorest households in PNG and Fiji would fall deeper into poverty. In the absence of specific data, HIV infections were assumed to be spread equally across each quintile.

PNG. A recent World Bank study projected national PNG poverty levels using patterns of output and employment growth. The study estimated that the percentage of the national population living below the BNPL was 53.5% in 2003, compared with 37.5% in 1996 (World Bank, 2004). PNG's weak economic growth has been one of the key drivers of this increase in poverty, as per capita GDP in 2004 was 10% lower than at independence in 1975.

The World Bank (2004) identified poor governance, peace-and-order problems, and structural impediments to growth in the national economy. GDP increased by 2.6% in 2004 and given the recent improvement in economic performance, the percentage of the population living below the FPL was assumed to decrease by 1 percent per year in the absence of HIV/AIDS.

High- and low-growth scenarios for HIV incidence were projected for each quintile, and the number of people falling below the FPL was estimated. In the high-growth scenario for PNG, an estimated 7.5% would fall below food need expenditure in 2020. This means about 0.6 million people in PNG would experience food poverty. Many households affected by HIV/AIDS are already living in poverty, and AIDS-related illness would drive this segment of the population into deeper poverty through escalating medical expenses and reduced household income. The aggregate national numbers of deaths and people affected by HIV/AIDS also are provided Figure 6.

Figure 6: Food Need Poverty Head Count Ratios for AIDS and Without AIDS (High-Growth Scenario) in PNG

Estimated AIDS Deaths Per Year[a]   % Population Below Food Poverty Line

PNG = Papua New Guinea.
[a] Lowest represents aggregate annual AIDS deaths for the three lowest-income quintiles, while highest represents the two higher-income quintiles.
Source: Simulations conducted for this report.

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Fiji Islands. Economic growth has been accelerating in Fiji Islands, reaching 3.8% in 2004. Agriculture, forestry, and fisheries have fueled this expansion, although ADB (2004c) predicts economic growth will decrease in the medium term due to a reduction in manufacturing. The same report notes a number of other challenges for Fiji Islands, including dependence on the sugar industry, shortage of skilled workers, poor infrastructure, and high utility costs.

Although national poverty levels are decreasing, pockets of poverty are emerging in urban squatter settlements and rural areas. The 2002 national household surveys showed that the total population living below basic needs threshold has remained relatively stable at about 30%, even with emerging pockets of poverty in urban areas. National food poverty is decreasing within Fiji Islands, falling from 9.9% of households in 1991 to about 9% of households currently. In the absence of HIV/AIDS, baseline poverty incidence was projected to decrease by 0.1% per year for both national poverty indicators.

High- and low-growth scenarios for HIV incidence were projected for each quintile, and poverty impacts were estimated. The effect of increased AIDS-related health spending, along with lower incomes from reduced working hours or job loss due to HIV/AIDS, will force an estimated 2,500 Fijians into food poverty under the high-growth scenario and nearly 1,000 under the low-growth scenario.

Figure 7: Food Need Poverty Head Count Ratios for AIDS and Without AIDS (High-Growth Scenario) in Fiji Islands

Estimated AIDS Deaths Per Year[a]   **% Population Below Food Need Line**

[a] Lowest represents aggregate annual AIDS deaths for the three lowest-income quintiles, while highest represents the two higher-income quintiles.
Source: Simulations conducted for this report.
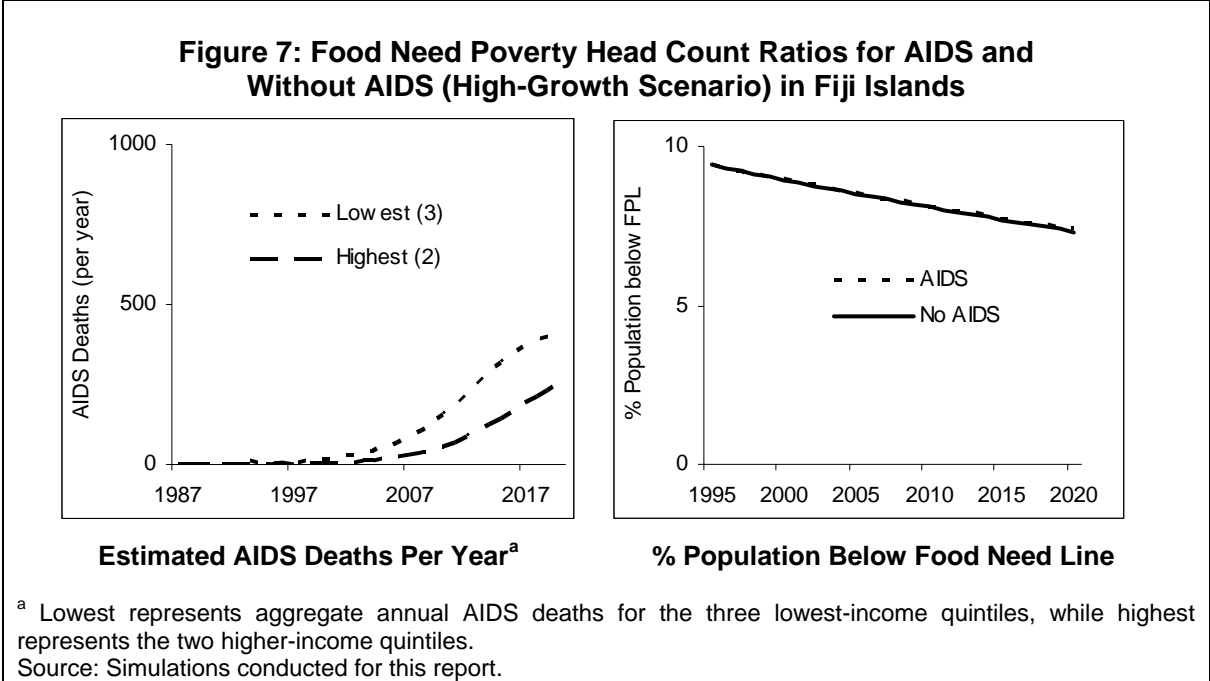
V.   CONCLUSIONS

A.   Summary

The simulation found that an estimated 600,000 people in PNG would fall into "food needs" poverty in 2020 due to HIV/AIDS under a high-growth epidemic scenario, while about 0.1 million would fall below the food threshold in a low-growth scenario. In Fiji Islands, much fewer people are projected to fall into food needs poverty as a result of HIV/AIDS. Only about 2,500 people in 2020 would be pushed below the food need line in a high-growth epidemic scenario.

Table 5: Poverty Head Counts and HIV Prevalence, Fiji Islands and PNG

Country	Fiji Islands	PNG
2020 (High-Growth Scenario)		
HIV Prevalence (%)	0.87	13.3
Additional People Below Food Need Line (%)	0.3	7.5
Additional People Below Food Need Line ('000)	0.3	560
2020 (Low-Growth Scenario)		
HIV Prevalence (%)	0.41	7.6
Additional People Below Food Need Line (%)	0.2	3.0
Additional People Below Food Need Line ('000)	0.2	320

PNG = Papua New Guinea
Source: Analysis conducted for this report.

These findings have direct implications for the achievement of the poverty-reduction targets agreed upon by the Government of PNG and ADB:

- A deepening of the epidemic would result in 13.3% of the adult population being HIV positive by 2020, leaving an additional 560,000 people facing food needs poverty.
- Many people already living below national poverty thresholds would plummet further into poverty. For example, under the high-growth scenario in PNG, about 0.2 million people would fall deeper into poverty as a result of an escalation in the spread of the disease.

Key impacts for Fiji Islands in 2020 include:

- Under the high-growth scenario, almost 2,500 people would fall below the national food needs expenditure threshold in 2020.
- Although fewer than in PNG, significant numbers of people already living below national poverty thresholds in Fiji Islands would be pushed further into poverty. For example, under the high-growth scenario, about 500 people will fall deeper into poverty as a result of an escalation in the spread of the disease.

Given the relative sizes of their epidemics, many more people will fall into poverty as a result of the spread of HIV/AIDS in PNG than in Fiji Islands. However, this indicator might hide the real poverty implications of the epidemic in PNG. When people who are already poor are factored into the equation, HIV/AIDS will force nearly 800,000 people into poverty or into more entrenched poverty. For a country with about 5.5 million people, this impact is substantial for PNG.

B.   Recommendations

The simulation results show that HIV/AIDS has extreme impacts on the financial situation of an affected household. Moreover, the national poverty impact for PNG is likely to be substantial. As such, HIV/AIDS needs to be identified as a threat to poverty targets and incorporated into poverty reduction strategies (Martin, 2004). While HIV/AIDS is mentioned in the poverty reduction strategy papers for some of the countries, these references relate to health sector interventions. They do not identify and target households of PLWHA who are at poverty risk (Martin, 2004).

Need for Analytical Work. The longer-term impacts of HIV/AIDS on affected households have received limited attention. Questions remain regarding, among others, how the impact changes over time, and what happens when other household members become infected. Surveys need to monitor the years following death to determine the impact of HIV/AIDS on surviving household members, and to ascertain whether any additional deaths occur (Kongsin, 2003). As care and treatment programs within these countries have just begun, an assessment of the effectiveness and poverty implications of extending these care and support services is difficult. ADB should work with other funding agencies and concerned governments to define indicators to measure poverty impact.

Protecting the Vulnerable and Improving Services. The various dimensions of poverty—including the incidence of poverty resulting from HIV/AIDS and general mapping of country-level poverty—need to be understood better. Such efforts will (i) help in developing national poverty-reduction strategies with mainstreamed HIV/AIDS components, (ii) assist in targeting poverty-reduction strategies, and (iii) improve basic service delivery. Key lessons learned from the simulation exercise that are relevant to improving services and targeting include:

- Households with HIV/AIDS-affected members force many into poverty. Safety nets must be developed that limit the need for households to sell productive assets, and reduce the number of households having to survive below subsistence levels. Government assistance programs need to target HIV/AIDS-affected households through food subsidies, free clothing, temporary shelter, or emergency cash transfers to households (Kongsin, 2003) to prevent an escalation in hardship and poverty throughout the region.
- Higher health care expenses and lower household incomes can cause families to withdraw their children from school to help with work and enter the job market to augment household income. Costs related to schooling, including clothing, books, stationery, and travel, could be subsidized or supported for the neediest of households (Kongsin, 2003).
- Poor households might be unable to access formal credit. Asian studies (Kongsin, 2003) found that more than half of AIDS-affected households borrowed money in the previous 6 months. Most borrowers used informal credit sources, such as relatives and local moneylenders. These informal credit sources typically charge high interest rates, exacerbating the financial predicament of these vulnerable AIDS-affected families. Microcredit schemes or trust funds could be an option to provide a buffer against catastrophic health events, such as an AIDS-related death.

Strengthening the Conditions for Pro-Poor Service Delivery. The health sectors in many PDMCs face serious operational and infrastructure barriers. Many of the poor in the Pacific live in remote areas with limited health services. In PNG, for example, the Highlands are disadvantaged in many aspects, as the high infant mortality rate attests. Although this region

also has a high incidence of HIV/AIDS, it is home to enclaves of economic activity that the Government could leverage to provide pro-poor health services. The recently formulated PNG HIV/AIDS Prevention and Control in Rural Development Enclaves Project proposes using mining sites, logging camps, fisheries, and other economic production locales that have high HIV transmission risk factors for peer-based behavioral change extension and social marketing of condoms (ADB, 2005).

The scope of private sector involvement in service delivery needs to be assessed to help reduce the costs associated with HIV/AIDS, and to reach hard-to-access poor populations within the region. Such reform will take time to design and should involve local stakeholders. Funding agencies should focus on activities that will improve disproportionately the health of the poor, particularly through primary health care. To decrease the demand for hospital care services, the development of home-based care systems for the Pacific could be useful. Such community-based care systems, which typically reduce the burden on hospitals and could lower treatment costs for affected households, should be considered as an alternative. Primary health care services are beneficial, because they are generally cost-effective and can decrease significantly the burden of disease.

Integrating Poverty Analysis Into Economic Evaluation. Cost-effective and general economic evaluation of potential health delivery services needs to be extended to include a poverty impact analysis. This extension requires that the distribution of project net benefits (determining the groups that gain or lose) be estimated. ADB (2001) noted that measuring how the poor directly benefit from a project might be complex. For example, provision of services to a geographic area might involve some households above and some below the poverty line, which makes poverty impact assessment difficult (ADB, 2001). The mapping of the HIV/AIDS epidemic, incidence of poverty, and uptake of prevention and care interventions will assist in determining the poverty ramifications of an investment. Appropriate monitoring and evaluation systems need to be implemented early to measure the poverty dimension impact of any policy or project investment.

Improved Targeting of Services. The simulation results suggest that not only does the number of people accessing ARV drugs matter, but who gets access also matters (Martin, 2004) Households in the lower-income quintiles, or those in the near-poor consumption sections of the economy, should be targeted. Subsidizing access to prevention is equally important, given the negative social nature of the disease. By improving the education and knowledge of poorer and disproportionately affected quintiles of the community, the more economically productive component also benefits as the reservoir of infection is reduced, along with the likelihood for the self-sustaining spread of the disease. Targeting high-risk groups, which in many cases might be from the poorer sections of the community, also minimizes infection across the core transmission routes of the disease—from drug users and sex workers to clients of sex workers and their partners. By effectively targeting these groups, the cost per infection averted will be much less than a blanket approach that fails to focus on key drivers of the epidemic.

Development Partner Planning. IHIV/AIDS investment options need to ranked and financed based on their poverty impact. Poverty assessments and their integral health components (including HIV/AIDS strategies) need to be embedded in country strategies and programs. Although country planning is at the heart of all major poverty-reduction planning efforts by funding agencies, health needs—specifically HIV/AIDS prevention and care investment—and the poverty implications are rarely articulated. With the influx of HIV/AIDS funding from development partners in recent years, aid agencies and recipient governments must harmonize

efforts to avoid duplication and to target households with special needs within the respective PDMCs.

VI. REFERENCES

Asian Development Bank (ADB). 2001. *Handbook for Integrating Poverty Impact Assessment in the Economic Analysis of Projects*. Manila.

———. 2004a. *Review of ADB's Poverty Reduction Strategy*. Manila.

———. 2004b. *Hardship and Poverty in the Pacific*. Manila.

———. 2004c. *Country Strategy and Program, 2005–2007*, Manila.

———. 2005. *Report and Recommendation of the President to the Board of Directors on a Proposed Grant to Papua New Guinea for the HIV/AIDS Prevention and Control in Rural Development Enclaves*. Manila. (G0042, approved on 25 April 2006).

———. 2006. *Key Indicators 2006*, Manila.

Bachmann, M.O., and F.L.R. Booysen. 2003. Health and Economic Impact of HIV/AIDS on South African Households: A Cohort Study. *BMC Public Health* 3 (2003):14–21.

Bloom, D., Riverpath Associates, and J. Sevilla. 2002. *Health, wealth, AIDS and Poverty*. Manila: ADB, January.

Bonnel, R. 2000. HIV/AIDS and economic growth: a global perspective. *South African Journal of Economics* 68: 820–855.

Centre for International Economics (CIE). 2002. *Potential Economic Impacts of an HIV/AIDS Epidemic in Papua New Guinea*. CIE report for Australian Agency for International Development, Canberra, February: 92.

Dennis, J. 2003. *Pacific Island seafarers. A study of the economic and social implications of seafaring on dependants and communities*. Report for the Pacific Seafarers Training Project. Suva: Secretariat of the Pacific Community.

Greener, R., K. Jeffries, and H. Siphambe. 2001. The Macroeconomic Impact of HIV/AIDS in Botswana. *AIDS Analysis Africa* 11(5): 4–6.

Kongsin, S. 1997. *Economic Impact of HIV/AIDS Mortality on Households in Rural Thailand*. Faculty of Public Health, Mahidol University.

———. 2003. *The Impact of HIV/AIDS Morbidity on Households in Upper-North Thailand: Phayao Case Study*. PhD Thesis. London: London School of Hygiene and Tropical Health, University of London.

McBride, W.J., and D. Bardford. 2004. Antiretroviral therapy for HIV-infected people in PNG: challenges and opportunities. *PNG Medical Journal* 47(1–2): 22–30.

Martin, G. 2004. *The Impact of HIV/AIDS on Poverty in Cambodia, India, Thailand and Viet Nam*. UNAIDS/ADB Study Series: Paper II Draft April.

Oriente, R. 2005. *HIV/AIDS and Pacific Island Regional Fishers and Seafarers: Information, Education and Communications Needs and Available Resources*. Secretariat of the Pacific Community, unpublished report.

Peteru, P. 2002. *Pacific Island Seafarers: A study on HIV/AIDS and STI risk-related behaviour*. Noumea, New Caledonia: Secretariat of the Pacific Community.

Pitiyanon, S., S. Kongsin, and W.S. Janjaroen. 1997. The Economic Impact of HIV/AIDS Mortality on Households in Thailand. In *The Economics of HIV and AIDS: the case of South and South East Asia*, edited by D. Bloom and P. Godwin. Dehli: Oxford University Press.

Secretariat of the Pacific Community. 2006. SPC PRISM Database.
Available: www.spc.int/prism

Suwanagool, S., W. Ratanasuwin, and W. Techasathit. 1997. The mounting medical care cost for adult AIDS patients at the Faculty of Medicine, Siriraj Hospital: consideration for management. *Journal Medical Association of Thailand* July (80)7: 431–438.

UNAIDS. 2005. *Report on the Global HIV/AIDS Epidemic*. Geneva.

———. 2003. Epidemiological Fact Sheets by Country.
Available: http://www.unaids.org/hivaidsinfo/statistics/june00/fact_sheets/index.html

World Bank. 1997. *Confronting AIDS: Public Priorities in a Global Epidemic*. A World Bank Policy Research Report. Oxford: Oxford University Press.

———. 2004. *Papua New Guinea: Poverty Assessment*. 30 June 2004: 60.

———. 2005. *Expanding Access to Antiretroviral Treatment in Thailand*. December 2005: 24

World Health Organization. 2005. *World Health Report 2005*. Geneva.

APPENDIX

POVERTY MODELING ASSUMPTIONS

For poverty modeling, several assumptions were made regarding national incomes, population size, population growth rates, households, basic needs expenditures, and food expenditures. Key assumptions for Papua New Guinea (PNG) and Fiji Islands are summarized in the following tables.

A. PNG Modeling Summary

Two epidemic growth scenarios were used to predict the incidence of HIV/AIDS in PNG over 1987–2020. The modeling approach to make these forecasts was described earlier in this chapter. Table A1 summarizes the data for the poverty simulation, based on a series assumptions regarding household size, income, expenditure, and distribution of income across quintiles.

Table A1: PNG Poverty Modeling Assumptions

Parameter	Estimate	Year/Source
National Economic Indicators [a]		
GNI (per capita)[b]	480	2003
Population (million)	5.8	2004
Population Growth Rate (%)[c]	2.8	2000–2004
Food Poverty Line ($ per person per year)	156	2002
Average Per Capita Income in 2002 ($)		
Q5 (highest)	1,125	Simulations conducted for this report
Q4	625	Simulations conducted for this report
Q3	375	Simulations conducted for this report
Q2	250	Simulations conducted for this report
Q1 (lowest)	125	Simulations conducted for this report
Food Expenditure as % of Income		
Q1–Q5 (proportion decreases for higher-income groups)	30–50	Simulations conducted for this report
Average Household Size		
Q5 (highest)	4.0	2002
Q4	4.5	2002
Q3	5.0	2002
Q2	5.8	2002
Q1 (lowest)	6.2	2002
Private Health Expenditure Per Person Without AIDS ($)		
Q5 (highest)	3 (1125)[d]	WHO (2005)
Q4	3 (625)	WHO (2005)
Q3	3 (375)	WHO (2005)
Q2	3 (250)	WHO (2005)
Q1 (lowest)	3 (125)	WHO (2005)
Private Health Expenditure Per Person With AIDS ($)[e]		
Q5 (highest)	853	Simulations conducted for this

Parameter	Estimate	Year/Source
		report
Q4	853	Simulations conducted for this report
Q3	403	Simulations conducted for this report
Q2	253	Simulations conducted for this report
Q1 (lowest)	103	Simulations conducted for this report
Reduced Income Per Person for AIDS-Affected Household [f]		
Q5 (highest)	30%	Simulations conducted for this report
Q4	30%	Simulations conducted for this report
Q3	30%	Simulations conducted for this report
Q2	30%	Simulations conducted for this report
Q1 (lowest)	30%	Simulations conducted for this report

GNI = gross national income, PNG = Papua New Guinea, Q = quintile, WHO= World Health Organization.
[a] http://www.adb.org/Statistics/pdf/Basic-Statistics-2005.pdf.
[b] Based on World Bank Atlas method unless otherwise specified.
[c] http://www.adb.org/Documents/Books/Key_Indicators/2005/xls/rt06.xls.
[d] Average per person income included in brackets.
[e] For 3 years.
[f] During AIDS or ART.
Source: Data are taken from ADB statistics (http://www.adb.org/Statistics/pdf/Basic-Statistics-2005.pdf), or consultant estimates are indicated for each assumption in the relevant line of the table

B. Fiji Islands Modeling Summary

The assumptions on household size, income, expenditure, and distribution of income across quintiles needed for the poverty simulation in Fiji Islands is summarized in Table A2.

Table A2: Fiji Islands Poverty Modeling Assumptions

Parameters	Estimate	Source/Year
National Economic Indicators [a]		
GNI Per Capita ($)	2,280	2003
Population (million)	0.8	2002
Population Growth Rate (%)	0.6	2003
Food Poverty Line ($ per person per year)	444	2002
Average Per Capita Income in 2002 ($)		
Q5 (highest)	5,130	Simulations conducted for this report
Q4	2,850	Simulations conducted for this report
Q3	1,710	Simulations conducted for this report
Q2	1,140	Simulations conducted for this report
Q1 (lowest)	570	Simulations conducted for this report
Food Expenditure as % of Income		
Q1–Q5 (proportion decreases with higher income groups)	20–45	Consultant
Average Household Size		

Parameters	Estimate	Source/Year
Q5 (highest)	4.0	2002
Q4	4.4	2002
Q3	4.7	2002
Q2	5.4	2002
Q1 (lowest)	6.1	2002
Private Health Expenditure Per Person Without AIDS ($)		
Q5 (highest)	28	Derived from WHO (2005)
Q4	28	Derived from WHO (2005)
Q3	28	Derived from WHO (2005)
Q2	28	Derived from WHO (2005)
Q1 (lowest)	28	Derived from WHO (2005)
Private Health Expenditure Per Person With AIDS ($)		
Q5 (highest)	878	Simulations conducted for this report
Q4	878	Simulations conducted for this report
Q3	528	Simulations conducted for this report
Q2	428	Simulations conducted for this report
Q1 (lowest)	328	Simulations conducted for this report
Reduced Income Per Person for AIDS-Affected Household		
Q5 (highest)	30%	Consultant
Q4	30%	Consultant
Q3	30%	Consultant
Q2	30%	Consultant
Q1 (lowest)	30%	Consultant

GNI = Gross National Income, Q = quintile, WHO= World Health Organization.
[a] http://www.adb.org/Statistics/pdf/Basic-Statistics-2005.pdf
 Source: Data are taken from ADB statistics (http://www.adb.org/Statistics/pdf/Basic-Statistics-2005.pdf), or consultant estimates are indicated for each assumption in the relevant line of the table