

Cost-Benefit Analysis of HIV Prevention Programs for Filipino Seafarers 2010 - 2015

Jari Kivela
November 2009



International
Labour
Organization

For
International Labour Organization

By
Qalys Health Economics
Jari Kivela
Health Economist
jari.kivela@Qalys.eu
November 2009



Table of contents

1	Executive summary	7
2	Background	11
3	HIV/AIDS in the Philippines.....	12
4	Scope and purposes.....	13
4.1	Objectives.....	13
4.2	Perspective.....	13
5	Methodology deployed.....	14
5.1.1	Description of the model	14
5.1.2	Time-line	15
5.1.3	Data sources.....	15
5.2	Model inputs.....	17
5.3	Target populations.....	17
5.3.1	Current seafarers	17
5.3.2	Spouses of current seafarers	18
5.3.3	Former seafarers.....	18
5.3.4	Spouses of former seafarers	18
5.3.5	Commercial sex workers.....	19
5.4	HIV transmission parameters.....	19
5.4.1	Risk behavior.....	19
5.4.2	HIV prevalence	19
5.4.3	STD prevalence.....	21
5.4.4	HIV transmission risks	22
6	Health care services for seafarers.....	22
7	Cost of HIV/AIDS	23
7.1	Cost of HIV/AIDS for shipping companies.....	24
7.1.1	Sick leave.....	24
7.1.2	Medical costs	24
7.1.3	Recruitment and travel cost of replacement crew members.....	25
7.1.4	Productivity loss.....	25
7.1.5	Workplace HIV prevention and HIV testing	25
7.2	Societal cost of HIV/AIDS in the maritime sector	26
7.2.1	HIV/AIDS care.....	26
7.2.2	Social Security System.....	26
7.2.3	Education	27
7.2.4	Overview of cost of HIV/AIDS	28
7.2.5	Excluded costs.....	29

8	Results.....	31
8.1	HIV prevention strategies	31
8.2	Base-line.....	32
8.2.1	Mother-to-child transmissions.....	32
8.3	Pre-Departure Orientation Seminar	33
8.4	Improved Pre-Departure Orientation Seminar	34
8.4.1	Cost of improved PDOS HIV/AIDS module.....	34
8.4.2	Impact of improved PDOS HIV/AIDS module.....	36
8.5	Pre-employment HIV testing.....	37
8.5.1	Cost of pre-employment HIV testing	38
8.5.2	Impact of pre-employment HIV testing	38
8.6	Peer education and condom distribution on-board	39
8.6.1	Cost of peer education and condom distribution on-board	40
8.6.2	Impact of peer education and condom distribution on-board	41
8.7	Voluntary post-employment HIV test and STD screening	42
8.7.1	Cost of voluntary post-employment HIV test and STD screening.....	43
8.7.2	Impact of voluntary post-employment HIV test and STD screening.....	44
8.8	Peer education for spouses	45
8.8.1	Cost of peer education for spouses	46
8.8.2	Impact of peer education for spouses	47
8.9	Excluded activities.....	47
8.10	Program cost summary 2010 – 2015	48
8.11	Cost comparison	49
8.12	Cost-benefit analysis.....	52
8.13	Case-study: Cost of HIV for a typical shipping company.....	54
9	Limitations.....	56
9.1	Generalizability of the results	56
10	Conclusion.....	57
11	Recommendations	58
11.1	Improve impact of PDOS HIV module.....	58
11.2	Prevention interventions for spouses.....	58
11.3	Abolish mandatory pre-employment HIV testing.....	58
11.4	HIV prevalence data.....	59
12	Acknowledgements.....	60
13	Additional chapter: Legal framework for HIV/AIDS in workplace	61
13.1	National legislations: the Philippine AIDS Prevention and Control Act	61
13.2	International legislation: the Universal Declaration of Human Rights	62
14	Annex	63

Table of figures

Figure 1: HIV/AIDS cases reported in the Philippines by year, Jan 1984 to 2009.....	12
Figure 2: Deployed Filipino seafarers 1985 – 2015. Projection 2008 – 2015.	17
Figure 3: Projected number of seafarers and their spouses 2010 - 2015.....	18
Figure 4: Estimated number of HIV infections in the target populations in 2010.....	20
Figure 5: Projected life-time societal costs for persons getting HIV infected in 2010.	28
Figure 6: HIV prevention strategies included in the cost-benefit analysis	31
Figure 7: Projected new HIV infections in base-line scenario 2010 - 2015.....	32
Figure 8: Distribution of new HIV infections in base-line scenario 2010 - 2015.....	32
Figure 9: Cost of one averted HIV infection 2010 – 2015.....	49
Figure 10: Program costs versus averted infections 2010 - 2015.....	50
Figure 11: Recommended order for selecting HIV prevention interventions	51

Acronyms

ADB	Asian Development Bank
AFP	Armed forces of the Philippines
AIDS	Acquired immune deficiency syndrome
ART	Antiretroviral therapy
ARV	Antiretroviral drug
CBA	Cost-benefit analysis
CSW	Commercial sex workers
DoH	Department of Health
ELISA	Enzyme-linked immunosorbant assay test
HIV	Human immunodeficiency virus
ILO	International Labour Organization
KAP	Knowledge, attitudes and practices
MSM	Men who have sex with men
MoT	Modes of Transmission model
MTCT	Mother-to-child transmission
NEC	National Epidemiology Center
OFW	Overseas Filipino workers
OI	Opportunistic infection
PDOS	Pre-departure orientation seminar
PHP	Philippine Peso
PMTCT	Preventing mother-to-child transmission
PNP	Philippine National Police
POEA	Philippine Overseas Employment Agency
PRC	Professional Regulatory Commission
PSU	Philippine Seafarers' Union
SIRC	Seafarers International Research Center
SSS	Social security system
STD	Sexually transmitted disease
UN	United Nations
UNAIDS	Joint United Nations Programme on HIV/AIDS
UNGASS	United Nations General Assembly Special Session
VDRL	Venereal disease research laboratory test

1 Executive summary

The International Labour Organization is the Lead Agency for workplace and private sector mobilization within the UN family. One of the sectors of ILO's interest is the international maritime industry and the impact of HIV/AIDS among its workforce. The Philippines is the world largest supplier of seafarers, contributing approximately 20% of the seafarers in the international maritime sector. 267,000 Filipino seafarers were deployed by international maritime industry in 2007¹.

Approximately 10% of the registered HIV cases are seafarers in the Philippines. Despite of the on-going prevention efforts Filipino seafarers seem to continue their high risk sexual practices and the number of HIV infected Filipino seafarers is increasing. This study was carried out to support decision making and planning of HIV prevention programs for Filipino seafarers and their spouses.

The following HIV/AIDS related costs for shipping companies were included in the analyses: increasing sick leave, medical costs (excluding ARV drugs), recruitment and travel cost of replacement crew members, on-job productivity loss and cost of HIV workplace prevention programs and HIV testing. The following societal costs of HIV/AIDS were included: HIV/AIDS care, social security support and education. Based on these inputs, an officer who gets HIV infected in 2010 would cost for the society in the Philippines 1,136,000 PHP (24,000 USD). Rating's HIV/AIDS related costs would be 780,000 PHP (16,000 USD) and an HIV infected spouse would costs 470,000 PHP (9,500 USD).

Combinations of five prevention strategies were applied during seafarers' employment circle: Pre-Departure Orientation Seminar (PDOS) HIV/AIDS module and pre-employment HIV testing, which are currently being implemented in full scale. Peer education and condom distribution on-board, post-employment HIV testing and peer education for spouses, which are currently not been implemented.

The effectiveness of all the interventions was compared with a base-line projection for 2010 – 2015, which was based on the current situation. 458 new HIV infections among seafarers and their spouses were projected within the six-year period. Alarmingly 59% of the new infections would be spousal transmissions: 216 among spouses of former seafarers and 54 among spouses of current seafarers. 184 current seafarers were projected to get HIV infected and only 4 former seafarers.

The PDOS HIV module has an impressive coverage. 92% of departing seafarers attended the training². However, the results of the Asian Development Bank's 2009 KAP survey suggest that PDOS HIV/AIDS module has not been very effective in increasing seafarers' condom use and decreasing number of sex partners³. From the economic point of view of this study this means that the resources used for the short PDOS HIV/AIDS module seems to generate little or no return on the investment.

¹ The Philippine Overseas Employment Agency (POEA), 2007, Filipino seafarers deployed by international maritime industry in 2007

² Saniel O, 2009, HIV Prevalence, Knowledge, Attitudes and Practices Among Seafarers in Cavite Province

³ Asian Development Bank, 2009, Seafarers' Knowledge, Attitudes, Practices, Vulnerabilities, and Risks to HIV

Therefore analyses were based on a hypothetical improved PDOS HIV module. The improved module would become cost-neutral, if seafarers' condom use with commercial sex workers (CSW) increased from 53% to 71%. This behavior change was predicted to avert 63 new HIV infections and the program costs were calculated to be 61.8 million PHP (1.3 million USD) for 2010 – 2015. One averted infection would cost 1.0 million PHP (20,700 USD).

HIV testing is often a mandatory part of Filipino seafarers' pre-employment medical examination. The majority, 82.4%, of Filipino seafarers deployed in the international shipping industry had taken an HIV test⁴. The mandatory HIV testing has an unintended positive externality; it would avert 15 spousal transmissions. The large scale testing is very expensive. The total costs were projected to be 315.5 million PHP (6.54 million USD) for 2010 – 2015. One averted infection would cost 21.0 million PHP (436,000 USD).

The third strategy was peer education and condom distribution on-board. The program coverage was set to reach 10% of the Filipino seafarers. The intervention was projected to avert 10 new HIV infections and the program costs to be 50.0 million PHP (1.04 million USD) for 2010 – 2015. The on-board peer education would prevent an HIV infection at costs of 5.0 million PHP (104,000 USD).

The fourth HIV prevention strategy was to promote voluntary HIV and STD testing before returning home. The coverage was set to 10% of the seafarer who engaged to high risk behavior during their last contract period. The intervention was predicted to avert 4 spousal transmissions and cost 31.1 million PHP (0.65 million USD) for 2010 – 2015. One averted infection would cost 7.8 million PHP (161,000 USD).

The fifth analyzed HIV prevention component is organizing peer education for spouses of seafarers. Alarming 59% of the new infections among the target populations would be through spousal transmissions. Therefore, there is an urgent need to scale-up prevention interventions targeting the spouses. The program coverage was set to reach 20% of spouses of current seafarers. The intervention was projected to avert 18 spousal transmissions and cost 61.0 million PHP (1.26 USD) for 2010 – 2015. The peer education for spouses would prevent an HIV infection at costs of 3.4 million PHP (70,300 USD).

The results suggest that the improved PDOS HIV module has the potential to prevent the largest number of infections at relatively low costs. Therefore, this would be the best choice for investing the limited resources. The second best choice would be to spend funds on peer-education for spouses. On-board peer education and voluntary post-employment HIV testing would also produce better return than the current setting. Finally the large scale pre-employment HIV testing seems to produce the lowest return.

Cost-benefit analyses from the societal perspective indicate that the improved PDOS HIV module would be cost-neutral and that all the remaining strategies would create a net loss in the Philippines. The expenses for pre-employment HIV testing are 39 times higher than its benefits. The cost-benefit ration of post-employment HIV testing is better, but still the costs are 14 times higher than the benefits. This may indicate that testing based prevention may not be a suitable option for the setting in the Philippines. Surprisingly, on-board peer education has a better cost-benefit ratio (4.9) than the peer

⁴ Saniel O, 2009, HIV Prevalence, Knowledge, Attitudes and Practices Among Seafarers in Bohol Province

education from spouses (6.4). This is because salaries and therefore time cost of seafarers are higher than spouses.

The good news seems to be that the HIV prevalence is relative low among Filipino seafarers and their spouses. However, this is not a reason for inaction, because results of several studies indicate that Filipino seafarers continue their high-risk sexual practices despite of the on-going HIV prevention programs. Therefore there is need for concentrated efforts to change this development. The not so good news is that the low incidence means that there are not many new HIV infections “to be prevented”. Consequently, prevented HIV infections among Filipino seafarers and their spouses come at a cost.

Currently the HIV/AIDS epidemic seems to have a very limited impact on a typical shipping company in the Philippines. A company with 220 crew members is likely to have one to two HIV infected seafarers 2010 - 2015. The results suggest that it would be cheaper for the shipping companies to employ HIV+ employees than continue paying for the pre-employment HIV testing.

The HIV/AIDS epidemic in the maritime sector seems to have a minor impact on macro-economic level in the Philippines. HIV infected seafarers are likely to be replaced by another Filipino seafarer. Therefore, on a macro level the flow of remittance and tax income remain constant. However, it is important to remember that on individual and family levels financial consequences of the disease are grave.

Based on the findings of this study and issues that appeared during the process the following recommendations are made for:

Improve impact of PDOS HIV module: The results of the Asian Development Bank’s 2009 KAP survey suggest that the currently common 10 - 20 minute version of PDOS HIV/AIDS module has not been very effective in increasing seafarers’ condom use and decreasing number of sex partners⁵. On the other hand, findings of this study suggest that, if the content and implementation of the PDOS HIV/AIDS module are improved, the intervention has the potential to produce good return for the investment. These improvements will require additional resources and efforts, but this seems to be money well spent.

Prevention interventions for spouses: The results indicate that the majority 59% of the projected new infections would be spousal transmissions 2010 - 2015. The group is currently not been reached by any large scale prevention interventions. There is an urgent need to develop and scale-up prevention programs aimed for the spouses of seafarers. The most affected group seems to be spouses of former seafarers.

⁵ Asian Development Bank, 2009, Seafarers’ Knowledge, Attitudes, Practices, Vulnerabilities, and Risks to HIV

Abolish mandatory pre-employment HIV testing: First of all mandatory HIV testing is illegal in the Philippines. Therefore mandatory pre-employment HIV testing is also illegal, even if it is done at the request of a foreign entity. All the parties involved should comply with the legislation and the competent authorities should enforce the law. Secondly there are economic reasons that lobby against the large scale mandatory pre-employment HIV testing of Filipino seafarers. The large scale testing is expensive and the benefits are limited. The results suggest that the cost of detecting an HIV+ seafarer is higher than a long-term cost increase of employing him. For these reasons we recommend shipping companies to move away from the mandatory pre-employment HIV screening and invest instead to e.g. facilitating on-board HIV peer education and condom distribution or improving quality of PDOS HIV module.

2 Background

The International Labour Organization is the Lead Agency for workplace and private sector mobilization within the UN family. It has experience in workplace policies and programs on HIV/AIDS and is engaging in national and workplace interventions addressing specific sectors, in order to tailor specific programs that take into account their needs and peculiarities.

One of the sectors of ILO's interest is the international maritime industry and the impact of HIV/AIDS among its workforce. The global maritime industry faces an increasing risk of HIV infection in many regions of the developing world. The close proximity of large sex-worker populations in the world's harbors and the fact that seafarers are young, mobile and sexually active, increase the risk of new HIV infections. Furthermore, the Maritime Labour Convention 2006 stresses the need of developing and implementing HIV prevention programs for seafarers and other workers operating in this sector.

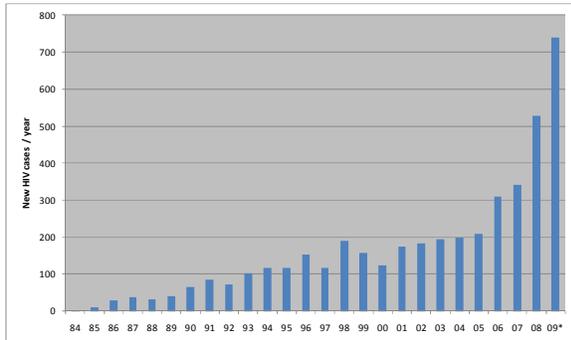
The Philippines is the world largest supplier of seafarers, contributing approximately 20% of the seafarers in the international maritime sector. According to the Philippine Overseas Employment Agency (POEA) 267,000 Filipino seafarers were deployed by international maritime industry in 2007.

The number of HIV infected Filipino seafarers is increasing. They are a potential route of transmitting the epidemic to the general population in the Philippines. Therefore there is a need for concentrated prevention efforts in the maritime sector. Cost-benefit analyses of the current and potential HIV prevention interventions targeting the seafarers and their spouses were carried out in order to facilitate decision-making and program planning.

3 HIV/AIDS in the Philippines

The Philippines is a low HIV prevalence country with 4,021 registered cases between 1984 and the end of July 2009⁶ (Figure 1). The national adult HIV prevalence remains under 0.1%⁷. During the past three years the number of new HIV cases has been growing at an increasing pace. Local experts are now looking at the possibility to redefine the HIV epidemic as “hidden and growing”, instead of “low and slow”.

Figure 1: HIV/AIDS cases reported in the Philippines by year, Jan 1984 to 2009⁶.



Overseas Filipino Workers (OFW) account for 31% of all the HIV cases in the Philippines. 1,275 OFWs, land and sea-based, have been reported to be HIV positive⁶**Error! Bookmark not defined.**. The one third of the HIV positive OFWs are seafarers. This means that approximately 420 Filipino seafarers have been tested HIV positive, which represents 10% of all the diagnosed HIV infections in the Philippines. The portion is high in comparison to the fact that current and former seafarers are approximately 1% of the population of the country. *Note: seafarers are tested more frequently than the general population.* However, the number of detected HIV cases is believed to represent only a portion of the all HIV+ seafarers.

⁶ Department of Health, National Epidemiology Center, Philippine HIV and AIDS Registry July 2009

⁷ HIV and AIDS Country Profile Philippines 2005

4 Scope and purposes

This report is intended for policy makers, governmental institutions, the ship owners associations, trade unions, manning agencies, port authorities, as well as the international counterparts and NGOs who are involved with HIV prevention efforts in the maritime sector in the Philippines.

The Filipino seafarers are a risk group for HIV/AIDS. They are a potential route of transmitting the epidemic to the general population in the Philippines. Despite of the on-going prevention efforts Filipino seafarers seem to continue their high risk sexual practices and the number of HIV infected Filipino seafarers is increasing. There is a need for concentrated prevention efforts in the maritime sector. This study was carried out to support these efforts by assessing cost-effectiveness of the current and potential HIV prevention interventions targeting the seafarers and their spouses in the Philippines.

4.1 Objectives

The main objectives of this study are:

1. Assess the economic viability and sustainability of implementing HIV prevention programs for the maritime workforce in the Philippines.
2. Conduct costing and cost-benefit analyses of the existing and potential HIV prevention interventions in the maritime sector in the Philippines.
3. Facilitate decision-making, program planning and resource allocation by indentifying workplace HIV prevention activities that are the most cost-effective and best suited for the maritime sector in the Philippines.
4. Conduct a case-study on a typical shipping company in the Philippines: Assess the current impact and costs of the HIV epidemic for a company.

4.2 Perspective

Cost-effectiveness analyses of this study were conducted from a societal perspective. Costs and consequences of HIV prevention activities were included regardless of who pays for or experiences them. In addition, the case-study was carried out from employers' perspective, from the point of view of a typical shipping company, where only costs and consequences that materialize at the workplace were included in the analyses.

5 Methodology deployed

Firstly estimations on the extent of the HIV epidemic among Filipino seafarers and their spouses were made. Then costs of the HIV/AIDS epidemic for society and shipping companies were analyzed. This was followed by, projections of costs and impacts of the existing and potential new HIV prevention strategies. Then the interventions were assessed by comparing the cost of averting one HIV infection. Finally cost-benefit analyses of the prevention programs were carried out from societal and employers' perspectives.

5.1.1 Description of the model

The economic impacts of the workplace HIV prevention programs were determined with a health economic model. The program costs of five workplace HIV prevention strategies were modeled for 2010 – 2015. Impacts of the strategies were measured as averted infections from the base-line, which was based on the current situation. The monetary benefits of the interventions were derived from cost savings resulting from averted HIV infections.

Projections of new HIV infections were based on UNAIDS Modes of Transmission model (MoT)⁸. The MoT model calculates the expected number of new infections per year on the basis of the current distribution of infections and patterns of risk within populations. The MoT is based on the formula of Weinstein et al⁹ and employed in the Avert model¹⁰. The following modifications were done to the MoT model: the time-line was extended from one year to six years and target populations were limited to 4 groups.

HIV prevention trainings and peer educations were seen as a continuous process. Therefore only benefits occurring within the six-year timeframe were included in the cost-benefit analysis. On the other hand, an HIV+ test result was seen as a permanent state. Knowing one's HIV status may reduce spousal transmissions. Therefore averted spousal transmissions were modeled up to 2020.

Future costs and benefits were discounted by 5% annually to their present value in 2009; to adjust the result for the fact that e.g. 100 USD was “worth” more ten years ago than 100 USD today. Financial information is presented as Philippine Pesos (PHP) and USD. PHP were translated to USD with an exchange rate 48.22 PHP to 1 USD on 31st August 2009. 5% annual inflation rate is applied to future costs in PHP¹¹.

⁸ UNAIDS, 2007, Modes of Transmission spreadsheets,

http://www.unaids.org/en/KnowledgeCentre/HIVData/Epidemiology/EPI_software2009.asp

⁹ Weinstein MC, Graham JD, Siegel JE, Fineberg HV, 1989, Cost-effectiveness analysis of AIDS prevention programs: concepts, complications, and illustrations. In *Confronting AIDS: Sexual Behavior and Intravenous Drug Use*, Washington, DC: National Academy Press; 1989:471-499.

¹⁰ Family Health International, 1998, AVERT: A Tool for Estimating Intervention Effects on the Reduction of HIV Transmission

¹¹ National Statistics Office of the Philippines, 2009, The consumer price index in the Philippines 2008, April 17 2009, <http://www.census.gov.ph/data/sectordata/sr09423tx.html>

5.1.2 Time-line

There is a long delay between an HIV infection and onset of HIV/AIDS related costs for companies and society. Table 1 below provides an overview progression of the disease and timing of the costs. The two columns on the left illustrate approximate progression of the disease from HIV infection to AIDS and death. Third column shows timing of HIV/AIDS related costs for a shipping company and the right column costs for society in the Philippines.

The time-line is based on the following inputs: In absence of antiretroviral therapy (ART) average delay between becoming HIV infected and onset of AIDS is 8 years¹². During the first eight years an HIV+ seafarer remains well and fully productive. Typically an HIV+ seafarer would commence ART 5 years after getting infected. It was assumed ARV drugs would be available for all seafarers who need them. ART regimens that are currently available in the Philippines would extend seafarer's working capability by additional 10 – 15 years. After this period seafarer's sickness gradually begins and the HIV infection progress to AIDS. When this happens the seafarer would leave the maritime workforce within one year and die within two years.

Shipping companies have the following HIV/AIDS related costs: Firstly they pay for seafarers' pre-employment HIV testing. Secondly, employer's HIV related costs begging to emerge when seafarer's disease progresses; sick leave and medical costs of more frequent illnesses (excluding ARVs which are provided by the Department of health) and on-job productivity declines. Finally replacement costs materialize when the HIV positive seafarer has to leave due to poor health; the sick crew member may need to be repatriated and a replacement seafarer needs to be hired and trained.

Societal costs in the table begin when a seafarer is tested HIV positive. Progress of employee's disease needs to be monitored regularly. These costs include consultations, laboratory monitoring and prophylaxis. Later the Department of Health provides the seafarer with ARV drugs, which are the largest component of life-time treatment costs. Health care costs increase when the disease progress to AIDS. When the seafarer leaves the workforce his remittance and income tax contributions come to a halt. Furthermore, a part of the resources spent on his education are seen as lost. Finally when the seafarer dies of AIDS, social security support will be provided for the widow and children under 21 years old.

5.1.3 Data sources

Information from a number of sources was used in the study. Representatives of key stake holders; governmental institutions, employees' and employers' unions, shipping companies, port authorities, health care providers, international organizations and NGOs, were met and interviewed in Manila city in the Philippines. Data of the National HIV and AIDS register and pre-employment medical examination clinics were used to quantifying the extent of the epidemic in the maritime sector. Cost information of existing HIV prevention interventions and program components were used for cost projections. Literature reviews were conducted to; estimate behavior change resulting from different HIV prevention interventions, assess methods to quantify benefits of HIV prevention intervention and measure HIV/AIDS related sick leave and benchmark HIV/AIDS mortality with and without ART. In the absence of data input parameter values were based on expert opinion.

¹² UNAIDS Reference Group on Estimates MaP. Improved methods and assumptions for estimation of the HIV/AIDS epidemic and its impact. AIDS 2002;16:W1-W14

Table 1: Progression of HIV/AIDS and costs to shipping companies and society in the Philippines¹³

Years from HIV infection	Progression of HIV/AIDS	Cost to shipping companies	Cost to society
HIV infection	Seafarer becomes HIV infected		
0 - 8 years	Seafarer remains well and fully productive (without ART)	HIV testing	Monitoring, prophylaxis
≈ 5 years	Seafarer commence ART and remains well and fully productive the next ≈10 years		ARV drugs, monitoring, prophylaxis
≈ 14 years	Sickness begins, the disease progress to AIDS	Illness related costs: sick leave, on-job productivity, medical costs	ARV drugs, hospitalizations, OI treatment costs, monitoring, prophylaxis
≈ 15 years	Seafarer leaves the maritime workforce	Replacement costs: Repatriation, recruitment, training	HIV/AIDS treatment costs, loss of remittances and tax income, lost education resources
≈ 15 years	Seafarer dies to AIDS		Funeral costs, social security support to family

¹³ Adapted from Rosen S, Simon J, Vincent JR, MacLeod W, Fox M, Thea DM. AIDS is your business. Harvard Business Review 2003;81(2):80-87

5.2 Model inputs

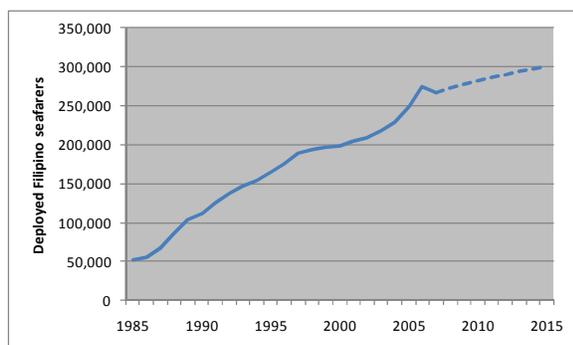
5.3 Target populations

The study is focused on the impact of HIV prevention interventions in two groups: Filipino seafarers and their spouses. Due to different HIV transmission risk profiles five sub-groups were used in the model: 1) current seafarer, 2) spouses of current seafarers, 3) former seafarers and 4) spouses of former seafarers. The total target population was projected to be 1.6 million Filipinos by 2015. HIV transmission projections were not expanded to the general population in the Philippines. 5) An additional population parameter was created to represent female sex workers abroad.

5.3.1 Current seafarers

The Philippines is the world largest supplier of seafarers. Filipino seafarers account approximately for 20% of the seafarers in the international maritime sector. According to the Philippine Overseas Employment Agency (POEA) 267,000 Filipino seafarers were deployed by the international maritime industry in 2007. The number of deployed Filipino seafarers was assumed to grow by 1.5 % annually 2008 - 2015. Hence 300,000 Filipino seafarers are projected to be deployed in 2015 (Figure 2). The research was limited to the international shipping industry, because it is the largest employer of the Filipino seafarers. Domestic shipping and fishery were excluded from the analysis. Only 0.6% of the Filipino seafarers were women. Therefore the study focused only on male seafarers.

Figure 2: Deployed Filipino seafarers 1985 – 2015. Projection 2008 – 2015.



The seafarers were divided into officers and ratings. According SIRC 2003 survey 28% of the Filipino seafarers were officers and 72% were ratings¹⁴. The first group includes; master, chief engineer, chief officer, first engineer, second and third officers, second and third engineers, radio officer and electric engineer. The former group: Electrician, boatswain, chief cook, able seaman, oiler, second cook, ordinary seaman and messman. Salaries for officers and ratings were calculated from Philippine

¹⁴ Amante M, 2003, Bitter sweet life for Filipino seafarers, gatasan (milking cow) of the global shipping fleet, Seafarers International Research Center, Cardiff University, UK

Seafarers' Union's minimum monthly wages in 2009¹⁵. The average monthly salary of Filipino officers on an international vessel was PHP 154,000 (USD 3,185) / month and for ratings PHP 56,000 (USD 1,161) / month. These amounts include allowances, leave pay and fixed / guaranteed overtime.

5.3.2 Spouses of current seafarers

78% of the Filipino seafarers are married or live in partnership¹⁶. A spouse definition in this study includes wives and women living in partnership with the seafarers. It was estimated that there will be 265,000 Filipino women whose partners are deployed in the international maritime industry in 2015.

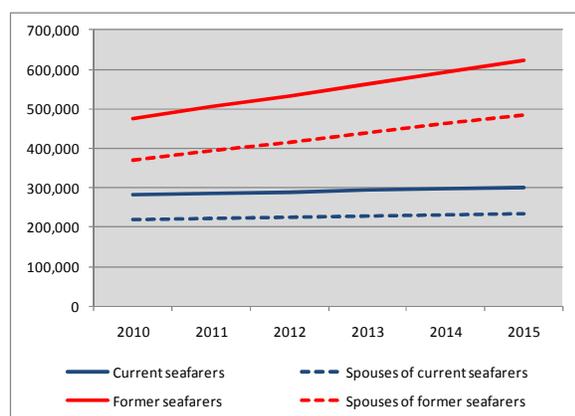
5.3.3 Former seafarers

The Philippines has a long tradition of providing seafarers to the international maritime industry. It was estimated that there are 447,000 former seafarers in 2009 (POEA's deployment figures 1984 – 2007 adjusted with 10% annual crew turnover¹⁷ and 5.15% annual death rate¹⁸). Furthermore, the number is expected to increase by 175,000 to 622,000 former seafarers by 2015. Potential impacts of the current workplace HIV prevention programs are only applied to seafarers employed after 2009. Figure 3 shows an overview of the target population projections for 2010 - 2015.

5.3.4 Spouses of former seafarers

It was assumed that 78% of the former seafarers are married or live in partnership. Consequently it was estimated that there are 350,000 spouses of former seafarers in 2009. This would increase to 486,000 spouses by 2015. The former seafarers and their spouses are the largest target groups. These two groups are particularly important for policy making because most of spousal HIV transmissions seem to happen within these populations.

Figure 3: Projected number of seafarers and their spouses 2010 - 2015



¹⁵ Philippine Seafarers' Union, IBF JSU/PSU-IMMAJ CA, monthly minimum wage scale from January 1st 2008 to December 31st 2009

¹⁶ Saniel O, 2009, HIV Prevalence, Knowledge, Attitudes and Practices Among Seafarers in Cavite Province

¹⁷ Author's estimation

¹⁸ CIA, 2008, the World Factbook, the Philippines

5.3.5 Commercial sex workers

The sex industry exists in most of the ports of the world and seafarers are a large client group of commercial sex workers (CSW). The majority of Filipino seafarers' high risk sexual encounters occur while abroad; particularly in Russia, Brazil, Indonesia, Thailand and Vietnam¹⁹. A literature review was conducted on HIV and STD prevalence among CSWs in these countries. 6% of the CSWs were estimated to HIV+ positive and 40% have had STD symptoms during the last 12 months.

5.4 HIV transmission parameters

5.4.1 Risk behavior

Commercial sex is often seen as socially undesirable. Therefore there is a reason to believe that seafarers' self-reports on commercial sex, condom use and number of sex partners may be under reported. For this reason the base-line estimate of seafarers' risk behavior was based on self-reported risk behavior in KAP study in Cavite province²⁰, which were assumed to be 25% under-reported. The following inputs were used in the base-line; 43% of current seafarers were estimated to be clients of CSW during their last tour of duty. The seafarers engaging in commercial sex would have on average 2.65 sex partners in one year (excluding their spouse). Condom use with CSWs was estimated to be low 53%. This is line with condom use with male clients of CSWs in the Philippines. 7% of former seafarers were assumed to be clients of CSW in the Philippines. They are likely to visit CSW once a month and use condom 50% of the times. Information on men who have sex with men (MSM) was not available in the maritime sector in the Philippines. Therefore MSMs were not included in the analysis.

Spouses of current seafarers would have 12 sexual exposures per year with their partner and spouses of former seafarers 52 exposures per year. Condom use in the long term relationships was reported to be low at 8.3%. Information on extramarital affairs of seafarers' spouses was not available. The likelihood of HIV transmissions from general population to the spouses is low. Therefore it was chosen to treat the spouses as 100% faithful in the model, because their extramarital affairs would not change the results or conclusions of the study.

5.4.2 HIV prevalence

Even though Filipino seafarers are one of the most tested HIV risk groups of the world, the exact HIV prevalence is unknown. The department of Health reported HIV prevalence of 0.26% among Overseas Filipino Workers (OFW) tested between January and February 2007²¹. Based on this the HIV prevalence of current seafarers was calculated to be 0.31% and former seafarers 0.24% (Table 2). Current seafarers spend on average 3 months per year at home. Due of the shorter exposure period, their spouses' HIV prevalence was assumed to be 0.08%. On the other hand former seafarers stay home throughout the

¹⁹ Suñas M, 2002, Health Profile and High-Risk Sexual Behavior among Returning Filipino Male Seafarers

²⁰ Saniel O, 2009, HIV Prevalence, Knowledge, Attitudes and Practices Among Seafarers in Cavite Province. (+25% estimated under reporting)

²¹ Department of Health, 2007, 2007 Estimates of Adults Living with HIV in the Philippines

entire year. Therefore spousal transmissions are more likely. Consequently HIV prevalence of their spouses was estimated to be 0.12%.

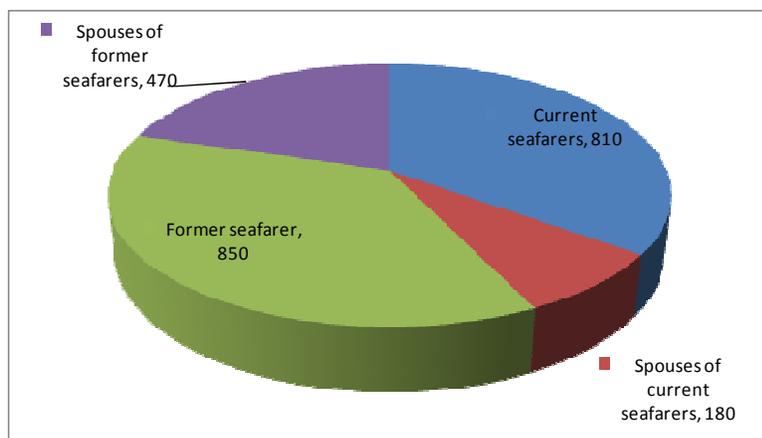
Furthermore, measurement of HIV prevalence among Filipino seafarers is complicate due to the current employment practices. Seafarers who are tested HIV positive are likely not to be re-employed. (*For more information on the legal aspects of this practice see an additional legal chapter at the end of the report*). Thus, they become former seafarers. As a result the HIV prevalence of currently deployed seafarers may be artificially low. Note: the forecast 2010 – 2015 is based on assumption that HIV+ seafarers are allowed to continue to work normally.

Table 2: HIV prevalence percentages base-line 2010.

Target population	HIV prevalence
Current seafarers	0.31%
Former seafarers	0.24%
Spouses of current seafarers	0.08%
Spouses of former seafarers	0.12%

Applying the above percentages to the target populations in 2010 compute the following numbers of HIV positive persons; 810 HIV+ current seafarers, 180 of their spouses, 850 HIV infected former seafarers and 470 of their spouses (Figure 4).

Figure 4: Estimated number of HIV infections in the target populations in 2010.



It was projected that the National HIV and AIDS registry would have approximately 1,500 HIV positive OFW registered by the end of 2010²². One third of the OFW registrations are seafarers. Thus, there would be approximately 500 HIV+ seafarers in the National Epidemiology Center’s register (NEC). This would mean that about 30% of all HIV positive seafarers would know their status and there may be a large number of “hidden” cases.

²² Author’s extrapolation based on the Philippine HIV and AIDS Registry data in July 2009

5.4.3 STD prevalence

The presence of sexually transmitted diseases (STD) increases HIV transmission risk. 4% of the current seafarers reported having had symptoms of STDs during the last 12 months²³. Information STD prevalence among former seafarers was not available. The portion of former seafarers engaging commercial sex in the Philippines is lower than the portion of current seafarers, 43% and 7% respectively. Therefore the STD prevalence of former seafarers was estimated to be 2%. As in Chapter 5.4.1 above, spouses were assumed to remain faithful and their STD prevalence was set to zero.

Table 3 summarizes HIV transmission parameters used in base-line 2010.

Table 3: HIV transmission parameters of base-line 2010.

Group	HIV prevalence	Risk group	STD prevalence	Partners / year	Acts / partner / year	Condom use %
Current seafarers	0.31% <small>24</small>	43% <small>25</small>	4% <small>23</small>	2.65 <small>26</small>	1.5 <small>27</small>	53% <small>25</small>
Spouses of current seafarers	0.08% <small>28</small>	100%	n/a	1	12 <small>27</small>	8.3% <small>25</small>
Former seafarers	0.24% <small>24</small>	7% <small>24</small>	2% <small>29</small>	12 <small>24</small>	1 <small>27</small>	50% <small>24</small>
Spouses of former seafarers	0.12% <small>28</small>	100%	n/a	1	52 <small>27</small>	8.3% <small>25</small>
CSW parameter	6% <small>30 31 32 33 ' 34 35 36 ' , ,</small>	n/a	40% <small>30 31 32 33 ' 34 35 36 ' , ,</small>	n/a	n/a	n/a

²³ Suñas M, 2002, Health profile and high-risk sexual behavior among returning Filipino male seafarers

²⁴ Department of Health, 2007, 2007 Estimates of Adults Living with HIV in the Philippines. (HIV prevalence of all seafarers 0.26%)

²⁵ Saníel O, 2009, HIV Prevalence, Knowledge, Attitudes and Practices Among Seafarers in Cavite Province. (+25% estimated under reporting)

²⁶ Author's calculation from Suñas M, 2002, Health profile and high-risk sexual behavior among returning Filipino male seafarers

²⁷ Author's estimation

²⁸ HIV prevalence projection based on the length of exposure periods

²⁹ Suñas M, 2002, Health profile and high-risk sexual behavior among returning Filipino male seafarers. (Estimated STD prevalence: a half current seafarers')

³⁰ UNAIDS, 2008, Country Progress Report of the Russian Federation on the Implementation of the Declaration of Commitment on HIV/AIDS. Reporting period January 2006 – December 2007

³¹ A Shakarishvili, 2005, Sex work, drug use, HIV infection, and spread of sexually transmitted infections in Moscow, Russian Federation, The Lancet, Volume 366, Issue 9479, Pages 57 - 60, 2 July 2005, doi:10.1016/S0140-6736(08)61345-8

³² UNAIDS, 2008, Epidemiological Fact Sheet on HIV and AIDS Core data on epidemiology and response Brazil Update 2008

³³ UNAIDS, 2008, UNGASS Indonesia Reporting Period 2006-2007

³⁴ Centers for AIDS Research, 1997, Fogarty AIDS International Training and Research Program / Indonesia

³⁵ UNAIDS, 2008, UNGASS Country Progress Report Thailand, Reporting period: January 2006 – December 2007

³⁶ The World Bank, Rapid Assessment of Seafarer STD, HIV and Drug Abuse Vulnerability in Vietnam

5.4.4 HIV transmission risks

The model represents a simplified version of reality of HIV transmissions. Seafarers are assumed to get HIV infected through commercial sex abroad and then infect their spouses in the Philippines. Seafarers who are currently employed spend typically three months per year at home. Because of the short period at home, spouses of HIV infected current seafarers are exposed to a lower risk of transmission. On the other hand the transmission risk of spouses of HIV+ former seafarers is higher due to the fact that their partners are home for entire year. Transmission risks used in the model are: 0.0011 per act from male to female and 0.0007 per act from female to male³⁷. The presence of STDs increases the transmission probabilities by four fold³⁸.

Due to the short six-year time-line and relatively low number of HIV+ cases, it was decided not to include HIV/AIDS mortality in the transmission modeling. The exclusion has only a minor influence on the results.

6 Health care services for seafarers

Shipping companies are responsible for organizing medical care of their crew members. According to an Asian Development Bank's 2009 KAP survey 83% of Filipino seafarers knew of a health facility from where they could get medical attention while employed³⁹. The most frequently used facilities for consultations were ship clinics (35%), hospitals (35%) and clinics at ports (18%).

However, there seems to be little connection between the current HIV prevention efforts in the Philippines and health care services offered to seafarers during their employment. For example information on symptoms and medication of STDs is often limited and self-treatment of STDs remains common. Furthermore only 24% of Filipino seafarers knew where to obtain condoms on-board³⁹. One possibility to enhance the connection between HIV prevention and on-board health care could be to introduce peer education and condom distribution on-board (see chapter 8.8 below).

All departing seafarers undergo a mandatory pre-employment medical examination in the Philippines. An HIV test is often a mandatory part of the medical examination (see chapter 8.5 below). The consultations are done in private clinics. The port of Manila does not offer health care services. Visiting or returning seafarers can seek medical attention in private clinics which are located in proximity of the harbor in Manila city.

³⁷ Gray et al. 2001, Probability of HIV-1 transmission per coital act in monogamous, heterosexual, HIV-1-discordant couples in Rakai, Uganda, *The Lancet*, Volume 357, Issue 9263, Pages 1149 - 1153, 14 April 2001, doi:10.1016/S0140-6736(00)04331-2

³⁸ Fleming et al. 1999, From epidemiological synergy to public health policy and practice: the contribution of other sexually transmitted diseases to sexual transmission of HIV infection, *Sexually Transmitted Infections* 1999;75:3-17; doi:10.1136/sti.75.1.3

³⁹ Asian Development Bank, 2009, *Seafarers' Knowledge, Attitudes, Practices, Vulnerabilities, and Risks to HIV*

7 Cost of HIV/AIDS

Table 4 provides an overview of the cost of HIV/AIDS in the maritime sector. The costs were analyzed on three horizontal levels: individual, organizational and societal level. The levels were divided into two vertical dimensions: direct costs that direct result of the epidemic, and indirect costs that are indirectly caused by the disease.

Direct costs of HIV/AIDS are relatively easy to measure and predict, in comparison to indirect costs which may be difficult to quantify. For example, on the individual employee level there might be data on sick leave days taken by HIV+ employees, but how the disease influence on their on-job-productivity is much more difficult to assess. Furthermore at the organizational level, shipping company's direct costs of implementing a workplace HIV prevention program can be calculated, but it is difficult to quantify the cost of lost experience in the workforce. Finally, on the societal level life-time HIV/AIDS treatment costs can be approximated, but quantifying poverty impact of the epidemic would require a study of its own. The HIV/AIDS related costs marked with a star (*) in Table 4 were excluded from the analyses, because of their low impact, immeasurability or that these were unrelated to the setting.

Table 4: Cost of HIV/AIDS in the maritime sector in the Philippines⁴⁰.

	Direct costs: Increasing expenses	Indirect costs: Declining productivity
Individual costs: HIV+ crew member	<ul style="list-style-type: none"> • Sick leave • Medical costs during employment (excl. ARVs) • Repatriations* • Recruitment and travel costs of a replacement • Training of a replacement* 	<ul style="list-style-type: none"> • Reduced on-job productivity • Open vacancies* • Management time* • Learning curve of replacement crew members* • Crew members' working time spend on HIV education*
Organizational costs: Shipping company	<ul style="list-style-type: none"> • Workplace HIV prevention • Pre-employment HIV testing • Increasing insurance premiums* • Shortages of officers and technical crew members* 	<ul style="list-style-type: none"> • Loss of experience and institutional memory* • Image and reputation of a shipping company as a responsible employer*
Societal costs: the Philippines	<ul style="list-style-type: none"> • HIV/AIDS care (DoH) • Social security support of widows and children (SSS) • Funeral expenses (SSS) • Declining remittances* • Declining tax revenues* 	<ul style="list-style-type: none"> • Education • Increased poverty* • Reduced growth*

⁴⁰ Adapted from Rosen S, Simon J, Vincent JR, MacLeod W, Fox M, Thea DM. AIDS is your business. Harvard Business Review 2003;81(2):80-87

7.1 Cost of HIV/AIDS for shipping companies

The costs of HIV/AIDS in the maritime sector differ from typical land-based workplaces for a number of reasons. Firstly Filipino seafarers are usually employed for fixed periods, not as permanent employees. This limits the length of period when employers are responsible for providing health care to their employees. Secondly due to the global nature of the shipping industry replacement costs of early HIV related resignations are higher than in traditional land-based employment. Finally, routine monitoring and consultations of stable HIV+ crew members' needs to be organized on-board or in harbors along the route of the vessel. The following HIV/AIDS related costs for shipping companies were included in the analyses.

7.1.1 Sick leave

According to the 2006 Maritime Labour Convention, if a crew member gets sick the ship-owner is liable for medical, board and lodging expenses to a period which shall not be less than 16 weeks⁴¹. On average Filipino seafarers were estimated to take 4.5 sick leave days per a nine-month contract⁴². Crew members who are within the first 8 years after HIV infection or crew members who are on ART were assumed to take the same number of sick leave days as their non-infected colleagues. Employees with an advanced HIV infection are likely to be more frequently sick and the duration their sicknesses increase. During their last contract period HIV+ crew members were estimated to take 24 sick leave days⁴³, regardless if they are or are not on ARTs. This means that HIV/AIDS would increase shipping companies' sick leave costs by 19.5 days per HIV+ seafarer. Note: No additional sick leave was allocated for routine monitoring or consultations.

7.1.2 Medical costs

Life-time treatments cost of an HIV+ person are analyzed in chapter 7.2.1 below. A part of the health care expenditures occur while employed, e.g. the HIV+ crew member may get malaria. The shipping company is liable for the health care costs during the employment period. However for a number of reasons shipping companies have a limited exposure to HIV related health care cost: Firstly ARV drugs are to be provided free of charge by the DoH. Secondly the largest treatment and hospitalizations costs occur at later stage of the disease and are likely happen after an HIV+ crew member has stopped working. Data on health care expenditures of HIV+ seafarers was not available. Therefore employers' annual HIV-related health care cost were estimated to be 3,200 PHP (66 USD) per HIV+ crew member in 2010. *Note: the figure should be interpreted cautiously as no data was available.*

⁴¹ Maritime Labour Convention 2006, Title 4 Regulation 4.2 - Shipowners' liability

⁴² 'Lower paid take more sick leave' 2007, Fin24.com, February 14, http://www.fin24.com/articles/default/display_article.aspx?ArticleId=1518-1786_2069279

⁴³ Maffessanti AP, Schneider DH 2004, "The impact of AIDS on absenteeism insurance in the Eastern Cape, South Africa", Int Conf AIDS. 2004 Jul 11-16; 15: abstract no. MoOrE1102

7.1.3 Recruitment and travel cost of replacement crew members

In general shipping companies hire Filipino seafarers through manning agencies, which take care of the recruitment in the Philippines. Typically a shipping company pays a manning agency; 1) a monthly fee for each crew member on-board, or 2) a fixed manning fee per vessel, which covers all Filipino crew members on-board. In a situation where a seafarer is not able to complete his contract e.g. health reasons, a manning agency is responsible to send a replacement crew member. Because of the fee structure, shipping company's monthly manning fee would remain the same. However, it would need to pay for the following additional recruitment costs; contact processing, pre-employment medical examination (including HIV testing), visas and a flag state license, averaging to 31,200 PHP (647 USD) per recruit⁴⁴ (cost of visas and flag state licenses vary considerably). In addition, average travel costs of a replacement crew member were 20,800 PHP (431 USD)⁴⁵.

It is important to take into account that the above costs take place also during the normal recruitment cycle. Filipino seafarers sign up on average for 9 months at a time. Thus, positions are normally filled 1.3 times per year. An early resignation would increase filling frequency of the position up to 2.2 times in that year. Therefore an HIV related early resignation would increase shipping companies' recruitment and travel costs at highest by 46,800 PHP (971 USD).

7.1.4 Productivity loss

In factory or agricultural settings, where employees' outputs can be measured, it is possible to monitor employees' on-job-productivity over time. In the maritime sector the monitoring is not possible, due to the nature of the work. During their last years of employment HIV+ persons tend to take more sick leave days and there is a reason to believe that their on-job-productivity could decline too.

In a retrospective study on an agricultural company in Kenya daily outputs of healthy and HIV+ employees were compared over time⁴⁶. On-job-productivity of HIV+ employees' declined by 13% during the last two years of service. The same productivity loss was applied to the last contract period of HIV+ seafarers. If an officer gets HIV infected in 2010, the shipping company is likely to have a long-term on-job-productivity loss of 180,000 PHP (3,700 USD) and if a rating gets HIV infected a cost of 65,000 PHP (1,350 USD) (The amounts are discounted to their present value in 2010).

7.1.5 Workplace HIV prevention and HIV testing

Cost of the current workplace HIV prevention interventions: PDOS HIV module and pre-employment HIV testing are analyzed in chapters 8.3 and 8.5. Impacts of HIV/AIDS on a typical shipping company are analyzed in a case-study in chapter 8.13.

⁴⁴ Magsaysay Maritime Corporation, 2009, average recruitment costs, personal communication

⁴⁵ Pandiman Philippines Inc., 2008, Repatriation and replacement records 2008

⁴⁶ Fox M et al, 2004, 'The impact of HIV/AIDS on labour productivity in Kenya', Tropical Medicine and International Health volume 9 no 3 pp 318–324 march 2004

7.2 Societal cost of HIV/AIDS in the maritime sector

How the HIV/AIDS epidemic develops in the maritime sector has a number of consequences on the societal level in the Philippines. Life-long treatment of HIV patients is expensive. The disease has the potential to kill people during the most productive years and may have an impact on remittances and income tax revenue. Widows and children of seafarers lost to HIV/AIDS are needed to be taken care off. Resources spent on education of seafarers who prematurely need to stop working are wasted. Finally an overview of the costs is given at the end of this chapter.

7.2.1 HIV/AIDS care

HIV treatment is an important part of society's efforts to control the epidemic and it is also an important cost driver. The Department of Health provides ARV drugs free of charge to patients whose CD4 count is lower than 200 cells/ μ L. According to DoH, first-line ARV drugs cost 7,230 PHP (150 USD) and second-line ARVs 81,970 PHP (1,700 USD) per patient per year in March 2009⁴⁷. 5% of patients on ART were assumed to shift to the second-line regimen. However, information on overall HIV/AIDS treatment costs; including consultations, laboratory monitoring, prophylaxis and treatment of OIs and hospitalizations, were not available in the Philippines. A literature review on life-time treatment costs in other resource limited settings was conducted. Discounted life-time HIV/AIDS treatment cost projections ranged between 253,000 PHP (5,250 USD)⁴⁸ and 455,000 (9,435 USD)⁴⁹. The estimated life-time HIV/AIDS treatment costs used in this analysis are 350,000 PHP (7,258 USD) per a patient on ART and 132,000 PHP (2,743 USD)⁴⁹ per a patient not on ART. Even though, the current ART coverage in the Philippines is 31% of those in need⁵⁰, it was assumed that the coverage would increase to 100% by 2010.

7.2.2 Social Security System

Filipino seafarers who are employed by a Filipino shipping company fall under a compulsory coverage of the Philippines Social Security System (SSS)⁵¹. The majority of Filipino seafarers in the international maritime sector are employed by foreign companies. Hence, their SSS membership is voluntary. 65% of the Filipino labor force are SSS members^{52,53}, but there are no records on membership of the seafarers. Therefore it was estimated that half of the Filipino seafarers are covered by SSS.

⁴⁷ The Department of Health, The National AIDS and STI Prevention and Control, 2009, Adult and Adolescent Anti-Retroviral (ARV) Drug Needs for 2009 – 2015 in the Philippines

⁴⁸ Badri M et al, 2006, When to initiate highly active antiretroviral therapy in sub-Saharan Africa? A South African cost-effectiveness study. *Antivir Ther.* 2006;11(1):63-72.

⁴⁹ Cleary M et al, 2006, The cost-effectiveness of Antiretroviral Treatment in Khayelitsha, South Africa – a primary data analysis, *Cost Effectiveness and Resource Allocation* 2006, 4:20 doi:10.1186/1478-7547-4-20

⁵⁰ UNAIDS / the World Health Organization, 2008, Epidemiological Fact Sheet on HIV and AIDS the Philippines 2008 update

⁵¹ Philippine Social Security System, 2008, Who are covered under the SSS? March 2008, <http://www.sss.gov.ph/sss/index2.jsp?secid=108&cat=2&pg=null>

⁵² Philippine Social Security System, 2009, Membership figures March 2009

⁵³ National Statistics Office of the Philippines, 2009, Labor Force Survey April 2009

If a seafarer is unable to work due to sickness and has exhausted sick leave days covered by the employer, SSS will compensate a maximum of 120 sick leave days per year at 90% of the member's salary, with a salary ceiling of 15,000 PHP (311 USD) per month⁵⁴.

If a seafarer dies, the widow and children under 21 years are entitled to benefits regardless of the cause of death. If the seafarer has paid more than 36 months of contributions the beneficiaries are entitled for the maximum benefits. The maximum monthly pensions for >10 years of credited service is 1,000 PHP per month⁵⁵. The widow is entitled to lifetime pension and children until they reach age of 21 years.

A death benefit example: 35 years old widow with 3 children aged 5, 10 and 15 years. The widow's lifetime pension would accumulate to 420,000 PHP (8,719 USD) and the total for all the three children until they reach 21 years 429,000 PHP (8,897 USD). Discounted present value of sum the pensions is 563,000 PHP (11,689 USD). Furthermore a funeral benefit of 20,000 PHP (414 USD) will be paid.

7.2.3 Education

The Philippines is the largest supplier of seafarer of the world. Educating and training the large number of qualified seafarers requires a lot of resources. Officers are required to have completed a maritime education in an officially recognized institution and to pass a test to obtain a license from the Professional Regulatory Commission (PRC). For example a 3 + 1 year Bachelor of Science in Marine Engineering costs in total 184,000 PHP (3,816 USD)⁵⁶ and the PRC board examination costs 900 PHP (19 USD)⁵⁷. The minimum education requirements for ratings are; a secondary school (high school) and a basic safety training course in an authorized maritime training center. The one-week basic safety training course costs 6,000 PHP (124 USD). However, the majority of ratings choose to conduct a Seafarers Rating Course, to become boatswain and to improve their chances in the labor market. E.g. a two-semester rating course costs 20,000 PHP (415 USD). Seafarers' education is typically paid by their families. HIV/AIDS affects persons in their most productive years. The average age of AIDS cases is 36 years in the Philippines⁵⁸. An HIV infected seafarer is probably not able to work the full years that he would without the disease. From societal perspective this means that a part of the money spent on his professional education will not be fully utilized. Typically an officer goes to sea at the age of 23 and works on average until 53 years⁵⁹. If he has to resign due to HIV/AIDS at age 36⁶⁰, 105,000 PHP (2,177 USD), 57% of the money invested in his professional education is seen to be lost. On average a rating would start his first voyage at age 25 and retire at age 49⁵⁹. If he has to resign due to HIV/AIDS at age of 36, 14,000 PHP (290 USD), 54% of the money invested in his professional training would be lost.

⁵⁴ Philippine Social Security System, 2008, Sickness benefits, <http://www.sss.gov.ph/sss/index2.jsp?secid=147&cat=4&pg=null>

⁵⁵ Philippine Social Security System, 2008, Death and funeral benefits, <http://www.sss.gov.ph/sss/index2.jsp?secid=77&cat=4&pg=null>

⁵⁶ Technological Institute of the Philippines, Bachelor of Science in Marine Transportation

⁵⁷ Professional Regulatory Commission, Registration and Licensing services

⁵⁸ Department of Health, National Epidemiology Center, Philippine HIV and AIDS Registry July 2009

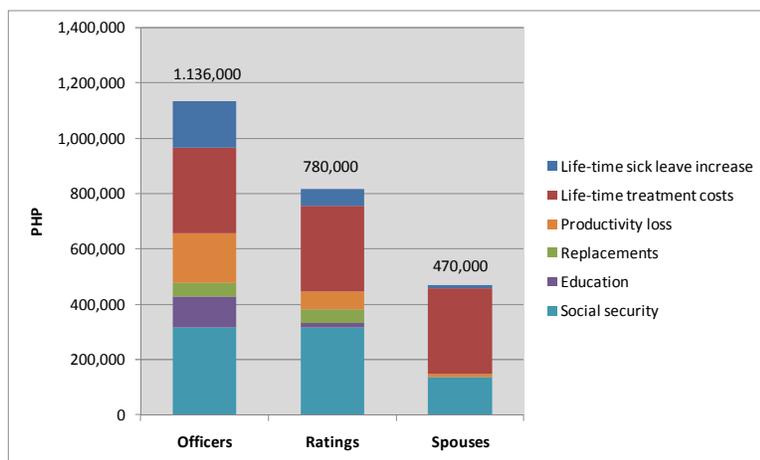
⁵⁹ Amante M, 2003, Philippine Global Seafarers: A Profile

⁶⁰ Median age at onset of AIDS, Department of Health, National Epidemiology Center, Philippine HIV and AIDS Registry July 2009

7.2.4 Overview of cost of HIV/AIDS

Figure 5 shows a comparison of HIV/AIDS related societal costs for; officers, ratings and spouses. The costs are highest for officers, whose salary and therefore time is valued the highest. If an officer gets HIV infected in 2010, this would cost for the society in the Philippines 1,136,000 PHP (24,000 USD). The largest component in these calculations is the social security support for the widow and children under 21 years old (light blue). Because of seafarers' higher salaries and insurance premiums, their beneficiaries would be entitled to the maximum benefits of SSS. The second largest expense is the life-time treatment costs, which are the same for all (red). Third productivity losses at work (orange) followed by increased sick leave days (blue) and lost education resources (violet). Ratings' HIV/AIDS related costs are lower [780,000 PHP (16,000 USD)], because of the lower time costs of sick leave and on-job productivity loss. Furthermore they spend fewer resources on education. Life-time treatment costs and SSS support remain the same. HIV costs of spouses were calculated from an average national salary. An HIV infected spouse costs the Philippine society 470,000 PHP (9,500 USD). For spouses the largest societal costs are the treatment costs and SSS support. However, one need to bear in mind that many of the spouses of seafarers do not work and therefore SSS support may be overestimated.

Figure 5: Projected life-time societal costs for persons getting HIV infected in 2010.



7.2.5 Excluded costs

The following HIV/AIDS related costs were excluded from the analysis because of their immeasurability, low impact or unsuitability for the study.

7.2.5.1 Repatriations

In 2008 the average costs of repatriation and replacement of a Filipino crew member was 45,000 PHP (933 USD)⁶¹. However, the number of HIV/AIDS related repatriations is likely to be very low, 1 – 2 out of 280,000 crew members per year. Furthermore shipping companies are insured against repatriations expenses. Therefore the HIV/AIDS related repatriations would not have an immediate impact on shipping companies' costs, but in a long run their insurance premiums could increase. Due to the very low numbers and absence of immediate costs consequences for shipping companies it was decided to exclude the possible HIV/ AIDS related repatriation costs from the cost-benefit analysis.

7.2.5.2 Training, learning curve and lost experience

Most of the shipping companies seem not to have an organized training program for their arriving crew members. The majority of the training is done ad hoc with more experienced crew members or as a part of routine safety drills. In addition, training needs vary considerably between positions. Consequently it was difficult to measure the training costs. Similarly it is hard to quantify the length of a learning curve, the period after which a new crew member is up to the job and what the impacts of losing experience in the workforce are. Therefore it was decided to not include these components in the analysis.

7.2.5.3 Open vacancies

If an HIV+ crew member needs to be replaced, there may be a period that the post is unfilled. In these situations other crew members will cover the sick employee until a replacement seafarer arrives. This is likely to have only a minor impact of the costs of a shipping company and was therefore excluded from the analysis.

7.2.5.4 Staff shortages

Recently manning agencies have reported to experience shortages of officer ranks and technical personnel⁶². On the other hand there is an oversupply of ratings. Therefore in the future it may be more costly and/or time consuming to find replacements for officers or technical personnel, who are unable to continue to work. However, with the current low HIV prevalence there are probably very few crew members who need to resign due to HIV/AIDS.

⁶¹ Pandiman Philippines Inc., 2008, Repatriation and replacement records 2008

⁶² Edita T, 2009, Supply Response of Filipino Workers to World Demand, International Organization for Migration

7.2.5.5 Working time spend on HIV education

PDOS HIV module is not paid working time. On-board peer education would be given during working hours on-board, as the ILO Code of Practice on HIV/AIDS recommends⁶³. However, it was assumed that during the journeys between harbors there would be enough vacant working time available for the peer-education. Therefore the training would not cause additional salary costs or productivity losses for the shipping companies.

7.2.5.6 Remittances and tax income

Remittances of Filipino seafarers make a significant contribution to the economy of the Philippines. The remittances account approximately for USD 2 billion annually⁶⁴. Legislation of the Philippines requires that 80% of earning of Overseas Filipino Workers (OFW) is sent home.

If a Filipino seafarer needs to resign due to health reasons, he is most likely replaced by another Filipino seafarer. Therefore from the societal perspective of this study, it does not matter who receives the salary, sends the remittances or pays the income tax in the Philippines, because the country receives the benefits in any case. Consequently, HIV/AIDS related resignations are likely to have a minor impact on the overall remittances and tax income in the Philippines. Hence remittances and tax income were excluded from the cost-benefit analysis. However, it is important to remember that at individual and family levels financial consequences of HIV/AIDS can be grave.

7.2.5.7 Poverty impact of HIV/AIDS

The combination of interruption of breadwinner's income and costs of HIV/AIDS care may eat up family's savings and push them to poverty. This is likely to have negative societal consequences, but the accessing the potential poverty impacts of HIV/AIDS in the Philippines would require a study of its own. Therefore the poverty impact was excluded from this study.

⁶³ International Labour Organization, 2001, An ILO code of practice on HIV/AIDS and the world of work

⁶⁴ Amante M, 2003, Bitter sweet life for Filipino seafarers, gatasan (milking cow) of the global shipping fleet, Seafarers International Research Center, Cardiff University, UK

8 Results

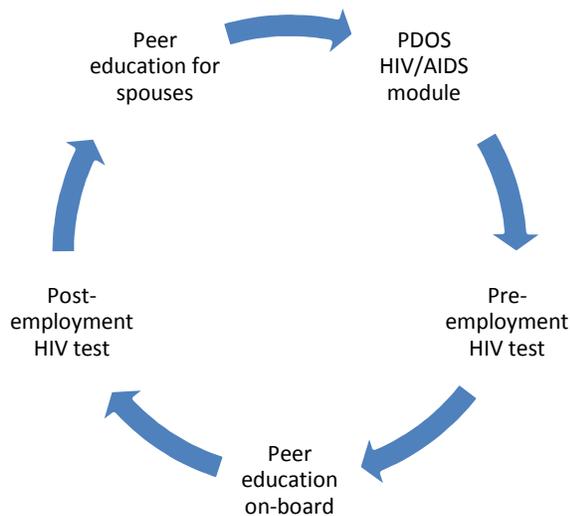
8.1 HIV prevention strategies

This chapter presents results of the research. Each prevention intervention is divided in to two sections: costs and impacts. The findings are then compared in cost summary and cost-benefit analyses at the end of the chapter.

Successful HIV prevention interventions pursue some combination of peer or health education, HIV testing, STD testing and treatment and condom distribution, that address needs and circumstances of the target group. The same applies to HIV prevention among Filipino seafarers. In the framework of this cost-benefit analysis a combination prevention strategies were applied during seafarers' employment circle. Only interventions that are under control or influence of the authorities in the Philippines were included in the analysis. Figure 6 provides an overview of the selected prevention strategies.

The first two; PDOS HIV/AIDS module and pre-employment HIV testing, are currently being implemented in full scale in the Philippines. The last three interventions; peer education on-board, post-employment HIV testing and peer education for spouses are currently not been implemented in scale. The effectiveness of all the interventions was compared with a base-line projection for 2010 - 2015, which is described in the next chapter. The prevention programs were analyzed one at the time and were seen as additional components to the base-line.

Figure 6: HIV prevention strategies included in the cost-benefit analysis



8.2 Base-line

The base-line projection was based on estimations of the current state of the HIV/AIDS epidemic in the maritime sector and high risk sexual behavior of Filipino seafarers and their spouses. The base-line scenario was used as a comparator of the all the analyzed prevention strategies.

Commercial sex is often seen as socially undesirable. Therefore there is a reason to believe that seafarers' self-reports on commercial sex, condom use and number of sex partners may be under reported. For this reason seafarers' risk behavior base-line was based on self-reported risk behavior in KAP study in Cavite province, which were assumed to be 25% under-reported. The base-line was based on the following parameters: During their last tour of duty 43% of the seafarers were clients of CSWs⁶⁵. Condom was used 50% of the times⁶⁵. The risk group members had on average 2.65 sex partners (excluding their spouses)⁶⁶. Table 3 above shows the input parameter values used for the base-line.

Figure 7 shows projected cumulative new HIV infections with the existing interventions for 2010 – 2015. 458 new persons were projected to get HIV infected within the six-year period. Alarming 59% of the new infections would be spousal transmissions: 216 among spouses of former seafarers and 54 among spouses of current seafarers. 184 current seafarers were projected to get HIV infected and only 4 former seafarers (Figure 8).

Figure 7: Projected new HIV infections in base-line scenario 2010 - 2015

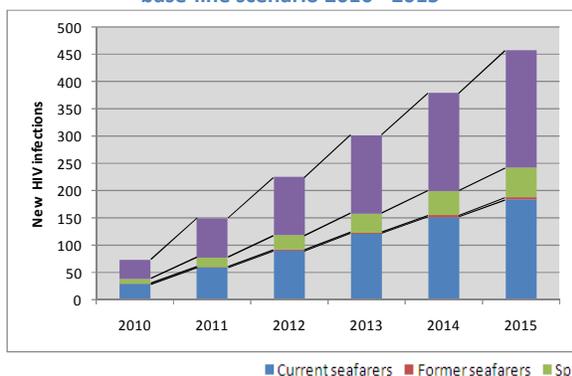
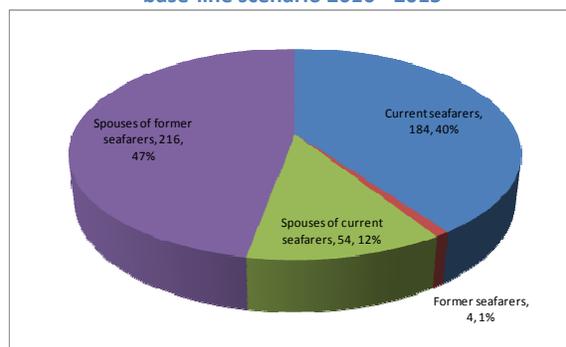


Figure 8: Distribution of new HIV infections in base-line scenario 2010 - 2015



8.2.1 Mother-to-child transmissions

In addition, it is important to be aware that there will be a number of mother-to-child transmissions (MTCT). If the newly infected women would have on average 1.5 children during the period 2010 – 2015, in the absence of prevention of mother-to-child transmission (PMTCT) services approximately 80 babies would get HIV infected. These MTCT cases were not included in the projections and cost-benefit analysis.

⁶⁵ Saniel O, 2009, HIV Prevalence, Knowledge, Attitudes and Practices Among Seafarers in Cavite Province. (+25% estimated under reporting)

⁶⁶ Author's calculation from Suñas M, 2002, Health profile and high-risk sexual behavior among returning Filipino male seafarers

8.3 Pre-Departure Orientation Seminar

Pre-Departure Orientation Seminar (PDOS) is a mandatory one-day education program for departing OFWs. The PDOS provides information on topics like; employment contracts, rights and obligations, remittances and travel procedures. HIV/AIDS training module was incorporated into a standard PDOS curriculum by the Philippine Overseas Employment Administration (POEA) in 2002⁶⁷. PDOS has a high coverage. The majority (92%) of departing seafarers attended the PDOS HIV/AIDS training⁶⁸. The official HIV/AIDS module should take 45 minutes and contain information on: the modes of transmission, ways of prevention and a discussion on HIV, AIDS and PLWHA⁶⁹.

In practice however, the content and duration of the PDOS HIV/AIDS modules varies. A majority of the HIV/AIDS modules was reported to last only for 10 – 20 minutes and contain often only a video presentation⁷⁰. The results of the Asian Development Bank's 2009 KAP survey suggest that number of sex partners and condom use of seafarers who received the PDOS HIV/AIDS module was statistically not different from seafarers who did not go through the PDOS HIV/AIDS training⁷¹. From the economic point of view of this study this means that the resources used for the short 10 – 20 minutes PDOS HIV/AIDS module seems to generate little or no return on the investment.

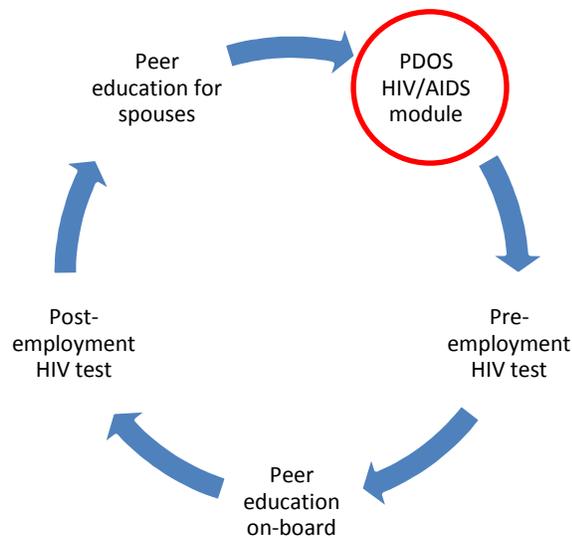
⁶⁷ The Philippine Overseas Employment Administration, Memorandum Circular No. 1, Series of 2002

⁶⁸ Saniel O, 2009, HIV Prevalence, Knowledge, Attitudes and Practices Among Seafarers in Cavite Province

⁶⁹ Quesada A.T and Marin M.L, 2006, Health at Stake: Access to Health of Overseas Filipino Workers: 2005 report

⁷⁰ Famador E. et al, 2008, A Survey of HIV/AIDS Information Dissemination for Migrant Workers

⁷¹ Asian Development Bank, 2009, Seafarers' Knowledge, Attitudes, Practices, Vulnerabilities, and Risks to HIV



8.4 Improved Pre-Departure Orientation Seminar

Therefore it was chosen to base the analysis on a hypothetical situation where departing seafarers would go through an improved PDOS HIV module; a 45-minute HIV training, which is led by an accredited trainer.

Improved HIV/AIDS module in PDOS: a 45-minute accredited trainer led HIV/AIDS training, which contains information on the modes of transmission, ways of prevention and a discussion on HIV, AIDS and PLWHA.

8.4.1 Cost of improved PDOS HIV/AIDS module

The economic costs of the hypothetical improved PDOS HIV/AIDS module were calculated for the following setup: Duration of the HIV/AIDS module is 45 minutes. The average group size is 30 seafarers. Seafarers repeat PDOS every 1.5 years.

An initial investment is required for the development and production of training materials for HIV prevention education. For example, printing costs of ILO's "Managing HIV/AIDS at the workplace" were 263 PHP (5.45 USD) per handbook⁷². The development and print costs of Achieve's "On the Move: A Toolkit of HIV Prevention Programmes for Migrant Workers" were 600 PHP (12.44 USD) per manual and 600 PHP (12.44 USD) per DVD⁷³. The total costs depend on the number of the prints made. Estimated cost of the training materials per PDOS HIV module were low at 7.40 PHP (0.14 USD), due to a long life

⁷² International Labour Organization and Employers Confederation of the Philippines, 2008, Managing HIV/AIDS in the workplace

⁷³ ACHIEVE, 2008, production costs of On the Move: A Toolkit of HIV Prevention Programmes for Migrant Workers

cycle of the materials and the large number of PDOS HIV trainings. The cost of brochures and handouts were estimated to be 10 PHP (0.21 USD) per participant.

To ensure the quality of HIV trainings, peer educators need to be properly trained. Achieve’s peer educator training program consist of three one day sessions; basic HIV/AIDS knowledge, presentation and communication skills and knowledge refresh. The training program cost 30,000 PHP (622 USD) per participant. It was assumed that a trainer will work for 3 years and will give two PDOS HIV modules per week. As a result the training costs of a peer educator are approximately 100 PHP (2.07 USD) per a PDOS HIV module. An HIV educator receives a salary of 500 PHP (10 USD) per HIV module.

Seafarers do not receive a salary or a per diem for the PDOS training day. They pay local transport and food costs by themselves. Many of the participants are from the provinces. Therefore average transport and food costs for a PDOS course were estimated to be 1,600 PHP (33 USD) per participant, of which 10%, 160 PHP (3.32 USD), were allocated for the HIV training. There are fixed costs for rent and utilities of the training location. A going rate for a space for 30 participants with a TV and a DVD player is 500 PHP (10.37 USD) per hour. Thus, 375 PHP (7.78 USD) per a 45-minute HIV/AIDS module.

As a result, the total costs of a PDOS HIV/AIDS module for 30 participants are 1,443 PHP (29.93 USD) and 48 PHP (1.00 USD) per participant. The PDOS are normally organized by manning agencies and the costs are paid by shipping companies as a part of recruitment fees. A summary of the costs is shown in Table 5. With 92% coverage of the departing seafarers and repetition of the PDOS course every 1.5 years, the total cost of PDOS HIV/AIDS modules are 61.8 million PHP (1.3 million USD) for 2010 – 2015 (Table 6).

Table 5: Cost of one PDOS HIV/AIDS training module

Cost	PHP	USD	Source
Training materials (HIV/AIDS training manual and video)	7.40	0.14	⁷⁴
Brochures and handouts	300	6.22	⁷⁵
Training of trainers	100	2.07	⁷⁶
Salary of trainer	500	10.34	⁷⁷
Transport and food costs (paid by the participants)	160	3.32	⁷⁵
Rent and utilities	375	7.78	⁷⁸
Total cost of a PDPS HIV/AIDS module	1,443	29.93	
Cost of PDOS HIV/AIDS module / seafarer	48	1.00	

⁷⁴ International Labour Organization and Employers Confederation of the Philippines, 2008, Managing HIV/AIDS in the workplace

⁷⁵ Author’s estimation

⁷⁶ ACHIEVE, 2009, Costs of HIV/AIDS peer educator training program

⁷⁷ ACHIEVE, 2009, Peer educator’s salary per PDOS HIV module

⁷⁸ Magsaysay Maritime Corporation, 2009, Estimation of facility costs of PDOS

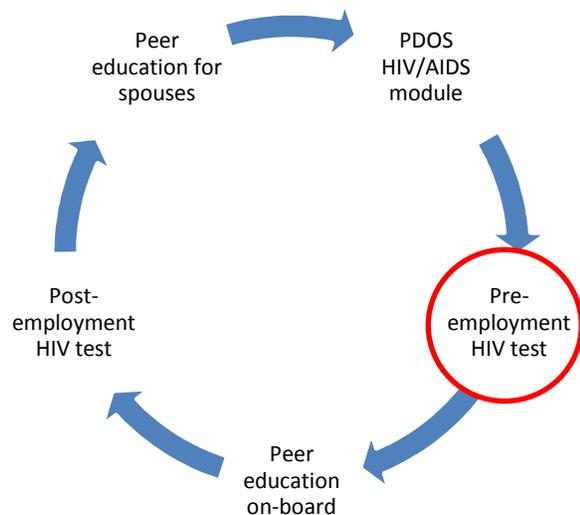
Table 6: Projected total cost of PDOS HIV/AIDS module 2010 – 2015

	2010	2011	2012	2013	2014	2015	2010 – 2015
PHP, million	8.8	9.3	9.9	10.6	11.2	11.9	61.8
USD, million	0.18	0.19	0.21	0.22	0.23	0.25	1.28

8.4.2 Impact of improved PDOS HIV/AIDS module

The improved PDOS HIV module is a theoretical situation. Therefore information its impact on behavior change is understandably not available. Therefore the research question was turned the other way around: “How much should Filipino seafarers’ condom use with CSW increase to make the improved PDOS HIV module worthwhile”? (with the given base-line, program costs and cost of HIV/AIDS for the society). An intervention is cost saving if the cost of averting one HIV infection is less than the cost of one HIV infection for the society.

The improved PDOS HIV module would become cost-neutral, if seafarers’ condom use with CSWs increased from 53% to 71%, everything else being equal. Any greater improvement would make the intervention cost saving for the society. This behavior change was predicted to avert 63 new HIV infections in the period 2010 – 2015. The majority 60 of the infections would be averted among seafarers themselves. This represents 32% reduction from the base-line projection. Three of the averted infections would be spousal transmissions. The low number is due to the fact that employed seafarers spend 9 months per year away and consequently the spousal transmissions occur gradually overtime. Based on the incidence projections and the cost of an improved PDOS HIV/AIDS module, one averted HIV infection would cost 980,000 PHP (20,300 USD).



8.5 Pre-employment HIV testing

HIV testing is often a part of Filipino seafarers' pre-employment medical examination. The testing is done in private clinics in the Philippines and most of the times it does not include counseling. As far as the author is aware, seafarers are usually not asked to give their written consent for sharing the test results with their employer. The majority, 82.4%⁷⁹, of Filipino seafarers deployed in the international shipping industry had taken an HIV test and 55% had done this within the last year⁷⁹. However, the high coverage and the testing frequency are not a result of voluntary behavior, but mainly caused by the fact that HIV testing is often a mandatory part of the recruitment process. *For the legal aspects of the mandatory HIV testing see an additional Chapter 13 at the end of the report. Furthermore a recently-published ILO study on Mandatory HIV testing for employment of migrant workers in eight countries of South-East Asia provides interesting insights to the topic*⁸⁰.

Pre-employment HIV testing:

an HIV test which is often a mandatory part of Filipino seafarers' pre-employment medical examination .

⁷⁹ Saniel O, 2009, HIV Prevalence, Knowledge, Attitudes and Practices Among Seafarers in Bohol Province

⁸⁰ International Labour Organization, 2009, Mandatory HIV testing for employment of migrant workers in eight countries of South-East Asia: From discrimination to social dialogue. Available at http://www.ilo.org/wcmsp5/groups/public/---asia/---ro-bangkok/---sro-bangkok/documents/publication/wcms_112972.pdf

8.5.1 Cost of pre-employment HIV testing

The cost of an HIV test is currently 400 PHP (8.2 USD)⁸¹. Testing of the large group of seafarers is expensive. 790,000 pre-employment HIV tests were predicted to be carried out 2010 – 2015. The projected total costs for the pre-employment HIV testing are 315.5 million PHP (6.54 million USD) for 2010 – 2015 (Table 7). New applicants pay for the test by themselves. The testing of seafarers who are being re-employed is normally paid by shipping companies as a part of manning agents' recruitment fees. Therefore it can be estimated that 90% of the testing expenses are paid by the shipping companies.

Table 7: Projected total cost of pre-departure HIV testing for 2010 – 2015

	2010	2011	2012	2013	2014	2015	2010 – 2015
PHP, million	50.9	51.6	52.3	53.0	53.6	54.1	315.5
USD, million	1.06	1.07	1.08	1.10	1.11	1.12	6.54

8.5.2 Impact of pre-employment HIV testing

Currently the pre-employment HIV testing is carried out as a protective measure of the shipping companies or insurance companies. The testing was assumed to have a limited impact on seafarers risk behavior, because no counseling or other HIV information is given when taking the test. Therefore, seafarers' sexual risk behavior was kept unchanged in the model. Currently HIV prevalence among Filipino seafarers seems to be low. Therefore the extensive testing would detect 136 new HIV infected seafarers within the six-year time frame. This means that one detected HIV case would cost 2.2 million PHP (48,200 USD).

Nevertheless, the company driven large scale mandatory HIV testing has an unintended positive externality in terms of; averted spousal transmissions. Without the testing 23 of the 136 HIV positive seafarers would had infected their spouses by 2020. The number of spousal transmission is low because employed seafarers spend 9 months per year away from home and 78% of them are married or live in partnership.

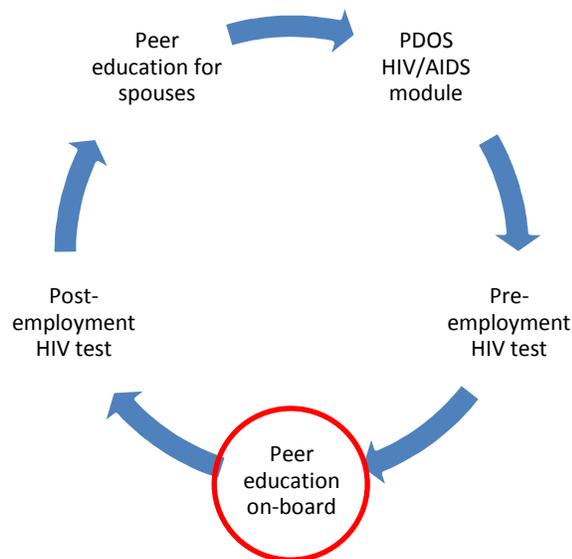
If the 136 seafarers know they are HIV infected, they are likely to take precautions not to infect their spouses. Knowing the HIV status was assumed to increase condom use of the discordant couples from 8.3%⁸² to 69%^{83, 84}. This would prevent 15 of the 25 spousal transmissions by 2020. As result, one averted HIV infection would cost 21.0 million PHP (436,000 USD).

⁸¹ Supercare Medical Services Inc., 2009, ELISA test

⁸² Sanieel O, 2009, HIV Prevalence, Knowledge, Attitudes and Practices Among Seafarers in Cavite Province

⁸³ Allen S et al, 1992, Effect of serotesting with counselling on condom use and seroconversion among HIV discordant couples in Africa

⁸⁴ Roth DL, Stewart KE, Clay OJ, et al. Sexual practices of HIV discordant and concordant couples in Rwanda: effects of a testing and counselling programme for men. Int J STD AIDS 2001;12:181–8.



8.6 Peer education and condom distribution on-board

Despite of the on-going prevention efforts Filipino seafarers seem to continue their high risk sexual practices. HIV prevention message needs to be repeated to create and maintain behavior change over time. Therefore the third strategy analyzed here is peer education on-board. The on-board education is not intended to substitute PDOS HIV/AIDS module, but to be an incremental component which is aimed to repeat and emphasize the message.

According to Famador et al. 85% of sea-based employees were interested to learn more about HIV/AIDS⁸⁵. 38% of the interested seafarers considered “regular HIV/AIDS education session at the workplace” as the most effective means to learn additional information. Interestingly this option scored higher than PDOS, which was preferred by 27% of the interested respondents. As far as the author is aware, no large scale on-board HIV trainings are organized in international shipping companies. However, a receiving environment for the on-board HIV trainings seems to be there already.

On-board peer education was proposed to be organized by one of the crew members who have received an HIV peer educator training. The training is essential to ensure effective and accurate HIV education on-board. An HIV education video and materials alone were seen as insufficient means of delivering an effective message on-board. Available resources are limited and full coverage is difficult to achieve. Therefore the on-board peer education coverage was set in this analysis to reach 10% of the Filipino seafarers during 2010 - 2015. This would mean that approximately 32,000 seafarers would undergo on-board HIV training each year. During the initial start-up period 90 peer educators would have to be trained each month to reach the 10% coverage in 2010. Afterwards 30 new peer educators would be trained per month to maintain the coverage.

⁸⁵ Famador E. et al, 2008, A Survey of HIV/AIDS Information Dissemination for Migrant Workers

Peer education on-board: an HIV training given by one of the crew members, who has received an HIV peer educator training.

To improve the impact of the on-board program, the peer educators would be also responsible for condom distribution on-board. According to Asian Development Bank's KAP survey only 24% of Filipino seafarers knew where to obtain condoms on-board⁸⁶. Thus, there seems to be a need to increase the availability of condoms on-board. However, the availability of condoms alone may not change attitudes or increase condom use. The combination of peer education and condom distribution was deemed to be more effective.

8.6.1 Cost of peer education and condom distribution on-board

Costing of the on-board peer education was based on the following; 1) a one-day training of a peer educator would cost 7,500 PHP (156 USD)⁸⁷, 2) the peer educators would give 2 on-board HIV trainings per year and carry out the role for 3 years, 3) the peer educator role is voluntary. Thus no additional compensation is paid, 4) on average 20 crew members would be reached per training, and 5) the training would be given during working hours on-board, as the ILO Code of Practice on HIV/AIDS recommends⁸⁸. However, it was assumed that during the journeys between harbors there would be enough vacant working time available for the peer-education. Therefore the training would not cause additional salary costs or productivity loses for the shipping companies. Furthermore, the underlining assumptions here were that: shipping companies are interested to have HIV education on-board, there are enough seafarers with rank, ability and willingness to take the peer educator role and there are enough organizations and funds to train the peer educators.

Materials used for PDOS and other HIV training; e.g. videos, brochures, posters and cartoons, are also suitable for on-board use. The same material costs were used as for the improved PDOS HIV module. However, the cost of material per training session is higher, because there are fewer training sessions on-board. The average costs of peer education was projected to be 154 PHP (3.19 USD) per crew member reached in the period 2010 – 2015.

The lowest wholesale prices of condoms were used in the costing; 7.2 PHP (0.15 USD) per condom. The quantity was based on one condom per a crew member per month, which equals to 2.8 condoms per month for seafarers engaging high risk sexual behavior. The average costs of condom distribution was projected to be 104 PHP (2.16 USD) per crew member reached in the period 2010 – 2015. The costs do not include logistic expenses, because the peer educators were assumed to bring the condoms with them on-board.

⁸⁶ Asian Development Bank, 2009, Seafarers' Knowledge, Attitudes, Practices, Vulnerabilities, and Risks to HIV

⁸⁷ Author's estimation

⁸⁸ International Labour Organization, 2001, An ILO code of practice on HIV/AIDS and the world of work

The combined costs of the on-board peer education and condom distribution were predicted to be 258 PHP (5.35 USD) per crew member reached (Table 8). The projected total costs of covering 10% of deployed Filipino seafarers 2010 - 2015 are 50.0 million PHP (1.04 million USD) (Table 9).

Table 8: Projected average cost of on-board peer education and condom distribution per reached crew member 2010 – 2015. *) Coverage % of all deployed Filipino seafarers

	PHP	USD	Coverage
On-board peer education	154	3.19	10%*
Condom distribution	104	2.14	10%*
Total costs per reached crew member	258	5.35	

Table 9: Projected total cost of peer education and condom distribution on-board for 2010 – 2015.

*) Higher program costs in the beginning of the program are due to training of peer educators.

	2010	2011	2012	2013	2014	2015	2010 – 2015
PHP, million	11.6*	6.8	7.2	7.7	8.1	8.6	50.0
USD, million	0.24*	0.14	0.15	0.16	0.17	0.18	1.04

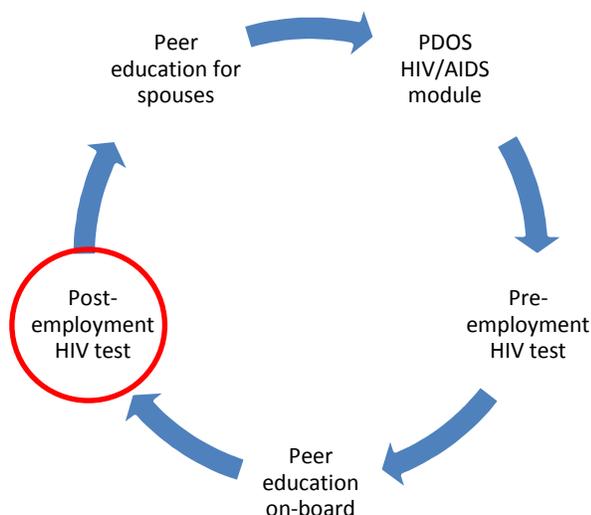
8.6.2 Impact of peer education and condom distribution on-board

On-board peer education and condom distribution were estimated to increase the condom use of reached seafarers to 70%⁸⁹. Furthermore, as a result of the peer education the portion of seafarers who engage in risky behavior was assumed to decline by 5% from 43% to 38%⁹⁰.

The on-board program has a relatively low impact, due to the limited 10% program coverage. 10 new HIV infections were predicted to be averted among the reached seafarers 2010 - 2015. This would not reduce spousal transmission within the six-year time frame. One averted infection would cost 5.0 million PHP (104,000 USD).

⁸⁹ Lowndes C et al, 2007, Interventions among male clients of female sex workers in Benin, West Africa: an essential component of targeted HIV preventive interventions, *Sexually Transmitted Infections* 83: 577–581

⁹⁰ Author's estimation



8.7 Voluntary post-employment HIV test and STD screening

The combination of the large percentage of seafarers engaging commercial sex (43%) and the low level of condom use with CSW (53%) means that up to 50,000 Filipino seafarers would have had unprotected high risk sex in 2009. According to the Asian Development Bank’s 2009 KAP survey 51% of Filipino seafarers did not know where they could obtain an HIV test⁹¹. Therefore the fourth HIV prevention strategy analyzed here is to promote voluntary HIV and STD testing before returning home. The target group of the strategy is the seafarers who have engaged in high-risk sexual behavior during their last tour of duty.

Post-employment HIV testing: a voluntary HIV test and STD screening for returning seafarers who have engaged high risk sexual behavior during their last contract period.

This strategy would be an incremental component to the PDOS HIV module. The previous trainings and education materials could include information on the importance of the testing and where the tests can be done. It is important to note that HIV and STD testing should be promoted as protection of seafarers’ spouses at home, not as a remedy for risky sexual behavior.

The aim of the voluntary post-employment HIV and STD testing strategy is to protect spouses and to prevent the further spread of the epidemic. The protection occurs in two ways; firstly treatment of STDs will decrease the HIV transmission risk from one person to another, if no condom is used. Secondly seafarers who are tested HIV positive are likely to take precautions not to infect their spouses.

⁹¹ Asian Development Bank, 2009, Seafarers’ Knowledge, Attitudes, Practices, Vulnerabilities, and Risks to HIV

This strategy has limitations which may decrease the testing uptake; 1) seafarers with asymptomatic STDs are less likely to get tested, 2) it is common that seafarers self-medicate STDs when symptoms arise, not when they arrive home, 3) when seafarers return to the Philippines they are busy with arrival practicalities and HIV and STD screening is likely not to be a priority, 4) the majority of seafarers has done an HIV test recently as a part of prior employment medical examination and may consider repetition of the test unnecessary. In conclusion the main challenge of this strategy is how to motivate the returning seafarers to take the voluntary test. Therefore the coverage was set to 10% of the seafarer who engaged to high risk behavior during their last contract period.

8.7.1 Cost of voluntary post-employment HIV test and STD screening

Most of the seafarers return to the Philippines via larger cities, where HIV and STD testing services are available. A rapid HIV test (ELISA) costs 400 PHP (8.30 USD)⁹² in private clinics and an STD test (VDRL) 400 PHP (8.30 USD) (Table 10). The average cost of STD treatment was estimated to be 240 PHP (5.00 USD). Seafarers would have to pay the tests and drugs by themselves.

With the 10% coverage, approximately 5,000 seafarers would take the tests each year. The projected total costs of voluntary post-employment HIV and STD testing are 31.1 million PHP (0.65 million USD) for 2010 – 2015 (Table 11).

Table 10: Cost of voluntary post-employment HIV and STD testing in 2009.

*) Coverage of seafarers who had high risk sexual encounters during their last contract

	PHP	USD	Coverage*
HIV test	400	8.3	10%
STD test	400	8.3	10%
Total	800	16.6	

Table 11: Projected total cost of voluntary post-employment HIV testing, STD testing and STD treatment for 2010 – 2015.

	2010	2011	2012	2013	2014	2015	2010 – 2015
PHP, million	4.7	4.9	5.1	5.3	5.5	5.7	31.1
USD, million	0.10	0.10	0.11	0.11	0.11	0.12	0.65

⁹² Supercare Medical Services Inc., 2009

8.7.2 Impact of voluntary post-employment HIV test and STD screening

If 10% of the seafarers who engaged in high risk behavior during their last contract period undergo voluntary post-employment testing; 18 new HIV infections would be detected and 540 STDs treated 2010 – 2015. This means that one detected HIV case would cost 767,000 PHP (15,900 USD) and a detected STD and treatment of it 32,000 PHP (655 USD).

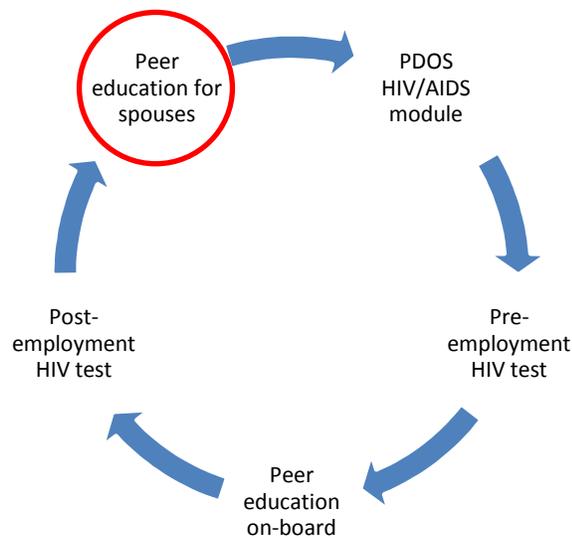
The post-employment HIV testing would detect only a limited number of new HIV infections in the Philippines. This is due to the fact that the majority of Filipino seafarers still undergo HIV testing in their pre-employment medical examinations. *It is important to note that the post-employment HIV testing may be more effective strategy in other program settings or countries where no large scale pre-employment HIV screening is done.*

Without knowing their status 3 of the 18 HIV positive seafarers would infect their spouses by 2020. On the other hand, if they know they are HIV infected they are likely to take precautions not to infect their spouses. Condom use of the discordant couples was assumed to increase from 8.3%⁹³ to 69%^{94, 95}. In addition, STD treatment would reduce the risk of spousal transmissions. Therefore in total the post-employment intervention was predicted to avert 4 spousal transmissions by 2020. The number of the averted spousal transmission is low due to the limited program coverage and the fact that employed seafarers spend 9 months per year away from home. One averted HIV infection would cost 7.8 million PHP (161,000 USD).

⁹³ Saniel O, 2009, HIV Prevalence, Knowledge, Attitudes and Practices Among Seafarers in Cavite Province

⁹⁴ Allen S et al, 1992, Effect of serotesting with counselling on condom use and seroconversion among HIV discordant couples in Africa

⁹⁵ Roth DL, Stewart KE, Clay OJ, et al. Sexual practices of HIV discordant and concordant couples in Rwanda: effects of a testing and counselling programme for men. Int J STD AIDS 2001;12:181–8.



8.8 Peer education for spouses

The fifth analyzed HIV prevention component is organizing peer education for spouses of seafarers. The spouse term used in this study includes wives and women who live in partnerships with seafarers. The base-line projections above indicate that many spouses are at risk of HIV. Alarmingly 59% of the new infections among the target populations of this study would be through spousal transmissions 2010 - 2015.

Spouses of seafarers are vulnerable to HIV/AIDS for a number of reasons; 1) biological factors increase females' risk of HIV infection, 2) their low level of knowledge of HIV/AIDS and perceived low risk, 3) low condom use, 4) attitudes to either tolerate their husbands' promiscuity or completely trust their faithfulness, and 5) economic dependence reduces their power to negotiate for safer sex.

Currently there seems to be a limited number of HIV prevention programs targeting the spouses of seafarers and address their vulnerabilities. The number of spouses reached remains very low in comparison to the large number of seafarers deployed each year. Therefore, there is an urgent need to scale-up prevention interventions targeting spouses of Filipino seafarers.

The trainings were assumed to be provided by peer educators of an existing network of civil society organizations and local government units. Due to the high portion of spousal transmission, it would be important to include information on prevention of mother-to-child transmission (PMTCT) to the program. The education would not solely focus on HIV/AIDS, but would also provide training on topics like; life skills, family planning and home management. This would increase spouses' participation. Training materials for spouses are already available e.g. Achieve's Taking Control: Life Skills Guidebook for Female Spouses and Partners of Migrant Workers.

HIV/AIDS peer education for spouses:
 a 3-hour accredited peer educator led HIV workshop for spouses of seafarers. The content of training is adapted to the realities faced by the spouses.

8.8.1 Cost of peer education for spouses

Costing of the peer education for spouses was based on the following inputs: All peer educators would undergo a one-day training course, which costs 10,000 PHP (207 USD) per person⁹⁶. The spouses are distributed around the country and are more difficult to reach. Therefore, the program coverage used in the forecast was limited to reach 20% of spouses of current seafarers 2010 - 2015. This would mean that approximately 45,000 spouses would receive HIV peer education each year. During the initial start up period 15 peer educators would be needed to be trained each month to reach the 20% coverage in 2010. Afterwards 5 new peer educators would be trained per month to maintain the coverage. It was assumed that a peer educator would carry the role for 3 years and give one training each month.

Duration of an HIV/AIDS part of trainings is 3 hours and the peer educators would receive a compensation of 1,500 PHP (31 USD)⁹⁷. Salary costs of other modules of the peer education were excluded from the calculations. Average trainings would have 20 participants. Training materials, including a guidebook, a video and brochures, would cost 210 PHP (4.36 USD) per workshop^{98,99}. 500 PHP (10.37 USD) was allocated for informing spouses about the training. Fixed costs for rent and utilities of a space where the training is organized were estimated to be 1,500 PHP (31.11 USD)¹⁰⁰. The trainings would be organized in locations close to spouses' homes. Therefore transport and food costs were assumed to be low 50 PHP (1.04 USD) per participant. A peer education session was projected to cost 4,035 PHP (83.68 USD) in total and 202 PHP (4.18 USD) per participant. Table 12 provides an overview of the costs. The total costs of providing peer education for 10% of the spouses were projected to be 61.0 million PHP (1.26 USD) 2010 – 2015 (Table 13).

Table 12: Cost of an HIV/AIDS peer education session for spouses in 2010

Cost	PHP	USD	Source
Training materials (a guidebook, a video and brochures)	210	4.36	^{98, 99}
Training of peer educators	275	5.70	⁹⁶

⁹⁶ One third of the costs of Achieve's three-day peer educator training costs

⁹⁷ Achieve's peer educator's salary per PDOS HIV module multiplied by three

⁹⁸ ACHIEVE, 2008, Production costs of On the Move: A Toolkit of HIV Prevention Programmes for Migrant Workers

⁹⁹ ACHIEVE, 2008, Production costs of Taking Control: Life Skills Guidebook for Female Spouses and Partners of Migrant Workers

¹⁰⁰ Magsaysay Maritime Corporation, 2009, Estimation of facility costs of PDOS

Salary of trainer	1,500	31.11	⁹⁷
Transport and food costs (paid by participants)	50	1.04	¹⁰¹
Outreach	500	10.37	¹⁰¹
Training facility cost Rent, utilities, TV and DVD player	1,500	31.11	¹⁰⁰
Total cost of HIV/AIDS module	4,035	83.68	
Cost of HIV/AIDS module / participant	202	4.18	

Table 13: Projected total cost of peer education training for spouses for 2010 – 2015.

*) Higher program costs in the beginning of the program are due to training of peer educators.

	2010	2011	2012	2013	2014	2015	2010 – 2015
PHP, million	12.5*	8.6	9.2	9.7	10.2	10.8	61.0
USD, million	0.26*	0.18	0.19	0.20	0.21	0.22	1.26

8.8.2 Impact of peer education for spouses

Behavior change resulting from the peer education for spouses is unclear. A literature review on published results in other countries gave conflicting results. Therefore it was assumed that 5% of the reached spouses would require 100% condom use or an HIV test. In addition condom use of the rest of reached spouses was estimated to increase from 8.3% to 20%. These behavior changes were projected to avert 18 spousal transmissions 2010 - 2015. One averted infection would cost 3.4 million PHP (70,300 USD).

8.9 Excluded activities

The following HIV prevention activities were excluded from the study: Firstly, HIV prevention interventions aimed for CSWs in the Philippines were excluded, because the majority of seafarers' risk behavior takes place abroad. Secondly, counseling when taking an HIV test was left out, because the majority of testing facilities do not provide the service in the Philippines. Thirdly, prevention of mother-to-child transmission (PTMTC) was excluded from the cost-benefit analysis, because assigning monetary value for societal costs of unborn HIV infected children was not feasible.

¹⁰¹ Author's estimation

8.10 Program cost summary 2010 – 2015

Table 14 summarizes the projected costs of implementing the HIV prevention programs 2010 - 2015. The large scale pre-employment HIV testing is the most expensive option. The six-year program costs were projected to cumulate to 315.5 million PHP (7.8 million USD), which is five times more than the costs of the improved PDOS HIV/AIDS module [61.8 million PHP (6.54 million USD)]. Providing peer education for 20% of the spouses of current seafarers would cost 61.0 million PHP (1.26 million USD). Organizing on-board education for 10% of the seafarers was projected to cost 50.0 million PHP (1.04 million USD). And finally the targeted post-employment HIV and STD testing, reaching 10% of the seafarers who have engaged high risk sexual behavior, would cost 31.1 million PHP (0.65 million USD).

The total costs are relevant for setting the limits on what can be done, but they do not inform decision makers on the effectiveness of the programs. Furthermore the costs depend on the chosen program coverage. The next two chapters will provide more insights regarding the comparison and selection of the interventions.

Table 14: Projected total costs of the HIV prevention programs 2010 – 2015.
(millions PHP, program coverage % in the brackets).

Intervention	2010	2011	2012	2013	2014	2015	2010 – 2015
Improved PDOS HIV/AIDS module (92%)	8.8	9.3	9.9	10.6	11.2	11.9	61.8
Pre-employment HIV testing (82%)	50.9	51.6	52.3	53.0	53.6	54.1	315.5
On-board peer education (10%)	11.6	6.8	7.2	7.7	8.1	8.6	50.0
Post-employment HIV and STD testing (10%)	4.7	4.9	5.1	5.3	5.5	5.7	31.1
Peer education for spouses (20%)	12.5	8.6	9.2	9.7	10.2	10.8	61.0

8.11 Cost comparison

Resources available for HIV prevention are limited. Therefore it is important that the available funds are spent on interventions that provide best return on investment. The HIV prevention programs were compared in the basis of the cost of averting an HIV infection.

Cost comparison of HIV prevention

programs: Comparison of the interventions on basis of the societal cost of averting an HIV infection.

Figure 9 illustrates the cost of an averted HIV infection for each of the programs. The results suggest that the improved PDOS HIV/AIDS module would provide the best value for money. One averted infection would cost 1.0 million PHP (20,700 USD). Followed by, the peer education for spouses 3.4 million PHP (70,300 USD). The on-board peer education would prevent an HIV infection at costs of 5.0 million PHP (104,000 USD). The voluntary post-employment HIV testing would require 7.8 million PHP (161,000 USD). Finally the large scale pre-employment HIV testing seems to produce the lowest return, an averted infection costing 21.0 million PHP (436,000 USD).

Figure 9: Cost of one averted HIV infection 2010 – 2015.

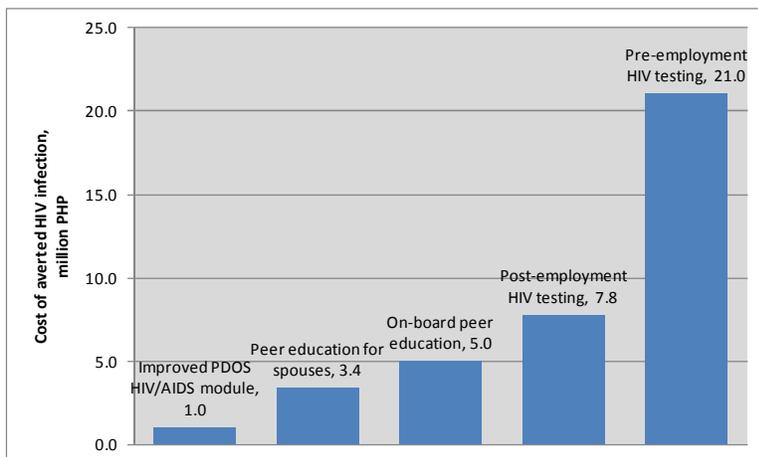
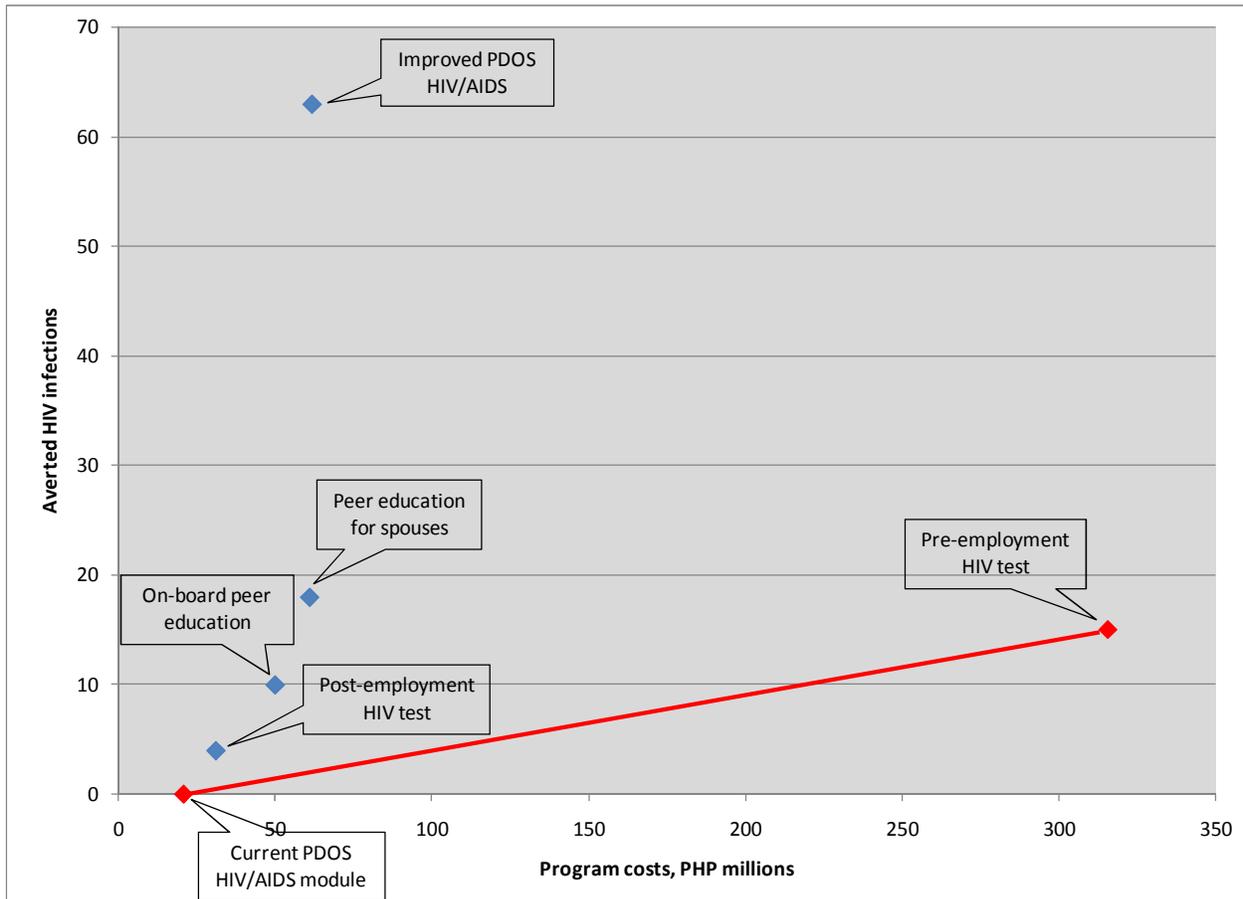


Figure 10 provides additional insights for decision making by plotting the number of averted infections (vertical axis) and the total program costs (horizontal axis) on the same graph. In principle interventions that are on the top-left corner of the graph are low cost and have high impact. Thus, they produce the highest return on investment. On the other hand, programs in the low-right corner are consuming a lot of resources and have limited impact. Therefore, they produce lower return on investment.

The red line connecting the existing prevention interventions; the current PDOS HIV module and the pre-employment HIV testing, present the current “production” of averted infections. The current PDOS HIV is located on level zero of the vertical scale, because it was reported not to create behavior change and consequently seems not to avert new infections. The pre-employment HIV testing has some impact by averting 15 infections, but at high costs. Interventions on the left and/or above the red line produce better return on investment than the existing programs.

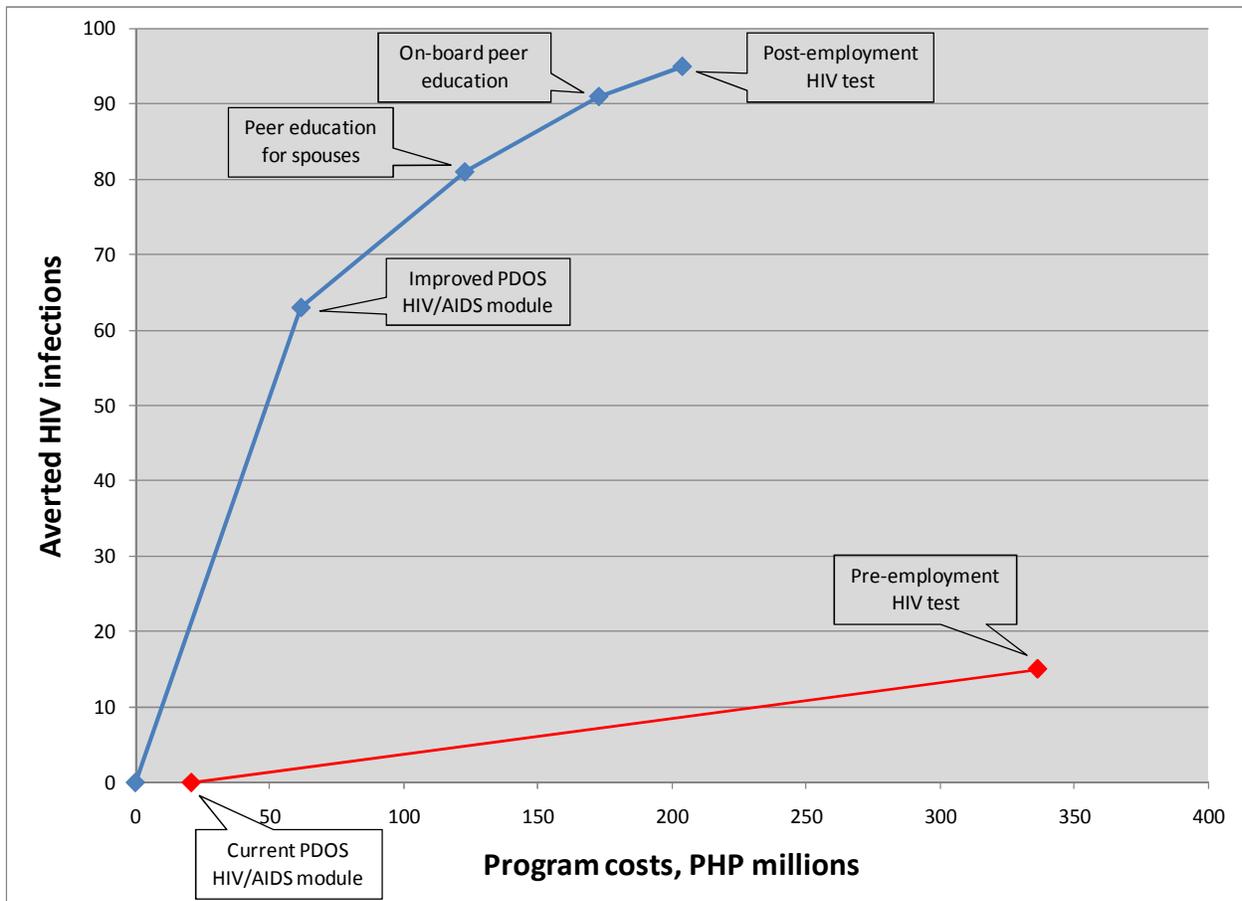
The results suggest that the improved PDOS HIV module has the potential to prevent the largest number of infections at relatively low costs. Therefore, this would be the best choice for investing the limited resources. The second best choice would be to spend funds on peer-education for spouses. On-board peer education and voluntary post-employment HIV testing would also produce better return than the current setting.

Figure 10: Program costs versus averted infections 2010 - 2015



Which interventions should the decision makers choose? Figure 11 illustrates a recommended choice which is based on the above comparison. The blue line illustrates the incremental relationship of the costs and averted infections, when interventions are added to another. In principle the decision makers should first implement the intervention that provides the best value for money, in this case the improved PDOS HIV module. Then, if more resources are available, invest on the second best choice peer education for spouses, then on on-board peer education and post-employment HIV testing. When moving towards the top-right end of the blue line the additional funds avert fewer infections, thus indicating declining returns. Nevertheless, the graph demonstrates that the combination of the new interventions would produce better return on investment than the current setting, which is represented by the red line.

Figure 11: Recommended order for selecting HIV prevention interventions



8.12 Cost-benefit analysis

A cost-benefit analysis evaluates if an intervention is worthwhile, by comparing the total costs of program implementation with the monetary value of the benefits. From the economic point of view of this research a program is worthwhile if the costs are lower than the benefits.

Cost-benefit analysis of an HIV prevention program: the total costs of implementing a program vs. monetary value of the benefits of the intervention.

The analysis was carried out from a societal perspective, where costs and consequences of HIV prevention programs were included regardless of who pays for or experiences them. Monetary value of the benefits was measured as cost savings resulting from averted infections, in other words from expenses that did not materialize e.g. HIV treatment. The consequences for shipping companies and society were analyzed in Chapter 7. Based on analysis in the chapter 7.2.4, an HIV infected officer was estimated to cost 1,136,000 PHP (24,000 USD) for the society in the Philippines, a rating 780,000 PHP (16,000 USD) and a spouse 470,000 PHP (9,500 USD).

The good news is that the HIV prevalence among Filipino seafarers and their spouses is low and that the new incidences seem to be relative low. This means that there are not many new HIV infections “to be prevented”. The cost of implementing a prevention program is independent from the number of averted infections. In other words, the cost of a similar prevention campaign in a high prevalence country will be the same, but the number of averted infections is likely to be higher. Consequently, prevented HIV infections among Filipino seafarers and their spouses come at a cost.

Table 15 summarizes the projections on averted HIV infections, costs, benefits and net impact of a program. The cost and benefits of the improved PDOS HIV module are equal. This means that the intervention is cost-neutral. All the remaining strategies would create a net loss in the Philippines. The expenses for pre-employment HIV testing are 39 times higher than its benefits. The cost-benefit ration of post-employment HIV testing is better, but still the costs are 14 times higher than the benefits. This may indicate that testing based prevention may not be a suitable option for the setting in the Philippines. Surprisingly, on-board peer education has a better cost-benefit ratio (4.9) than the peer education from spouses (6.4). This is because salaries and therefore time cost of seafarers are higher than spouses.

In addition, cost-benefit analyses come with a measurement problem, which often means that a range of benefits cannot be valued in monetary terms (chapter 7.2.5 above). Thus, the cost-benefit figures may not always represent a complete picture. Furthermore, one should keep in mind that cost-benefit information is and should not be the only decision making criteria. There are other important factors e.g. medical criteria and equity concerns, which need to be taken into account.

Table 15: Averted infections, total costs and benefits, net impacts and cost-benefit ratios of the HIV prevention strategies

Intervention	Averted infections	Seafarers	Spouses	Total costs	Total benefits	Net impact	Cost-benefit ratio
Improved PDOS HIV/AIDS module (92%)	62	60	3	61.8	61.8	0.0	0.0
Pre-employment HIV testing (82%)	15		15	315.5	8.0	-307.5	39.4
On-board peer education (10%)	10	10		50.0	10.3	-39.7	4.9
Post-employment HIV and STD testing (10%)	4		4	31.1	2.1	-29.0	14.8
Peer education for spouses (20%)	18		18	61.0	9.6	-51.4	6.4

In addition Table 15 differentiates on which target group the interventions have an impact. PDOS HIV module and on-board peer education benefit mainly seafarers. And on the other hand spouses benefit from HIV testing and peer education aimed to them. Shipping companies, whose primary objective is to limit the impact of the epidemic on their workforce, could therefore funnel their resources to improving the PDOS HIV module and facilitating on-board peer education.

8.13 Case-study: Cost of HIV for a typical shipping company

In this case-study costs of HIV are analyzed from the point of view of a typical international shipping company. A typical shipping company was assumed to have 20 vessels, 220 crew members; 60 officers and 160 ratings. The case-study is applicable to Filipino or foreign owned shipping companies as long as the majority of the crew is Filipino seafarers, who are recruited through a manning agency in the Philippines.

What are the costs of HIV for the company? It is common for a shipping company to take protective measures to limit the company's exposure to HIV related labor costs increases. The employer requires crew members to take an HIV test in their pre-employment medical examination. If a crew member is tested HIV positive the company will not hire the person. First of all, this practice is illegal (see chapter 13). Secondly the shipping company pays most of the tests. If crew members repeat the test on average every 1.8 years, approximately 725 tests would be taken 2010 – 2015. These tests would cost for the employer approximately 260,000 PHP (5,400 USD), assuming that testing of seafarers who are being re-employed would be paid by the company and new applicants would pay the tests by themselves.

HIV prevalence in the maritime workforce in the Philippines was report to be 0.26%¹⁰². This would mean that the company is likely to have one HIV infected crew member, assuming that HIV+ employees are hired. Furthermore the results indicate that there is an 8% chance that a second seafarer would get HIV infected within the six-year time frame, everything else being equal. Therefore the shipping company has a very limited exposure to HIV related cost increases.

If an HIV positive crew member is an officer, the disease was estimated to increase a shipping company's labor costs by 345,000 PHP (7,200 USD). For a rating the cost increase would be 135,000 PHP (2,800 USD) (Table 16). With ARV medication HIV+ seafarers were assumed to be able continue working for 15 years after getting infected. Future costs are discounted to their present value in 2010.

Table 16: Projected HIV/AIDS related cost increases for a shipping company

Cost increase	Officer	Rating
Increase sick leave	150,000	55,000
Declining on-job-productivity	180,000	65,000
Replacement costs	15,000	15,000
Total	345,000	135,000

The majority (72%) of Filipino seafarers are ratings. Therefore the results here indicate that within the six-year time-line the cost of pre-employment HIV testing is higher than the long-term cost increase of employing HIV+ crew members. In other words it would be cheaper for the companies to employ HIV+ employees than pay the pre-employment HIV testing.

¹⁰² Department of Health, 2007, 2007 Estimates of Adults Living with HIV in the Philippines

Clearly the balance between the cost of employing HIV+ employees and the costs of protective measures, like mandatory HIV testing, could change if the HIV prevalence in the maritime workforce increase. Therefore it would be important that the shipping companies would use their resources on HIV prevention instead of HIV testing. Their investment on e.g. facilitating on-board HIV peer education and condom distribution or improving quality of the PDOS HIV module, are likely to produce better return for their money, because these strategies are preventing the epidemic from spreading further in their workforce. Moreover, having a workplace HIV prevention program is beneficial for company's image among its customers and for company's reputation as a good employer to attract new employees. *Furthermore a recently-published ILO study on Mandatory HIV testing for employment of migrant workers in eight countries of South-East Asia provides interesting insights to the topic¹⁰³.*

There are other practical steps that the shipping companies could take. They could request manning agencies to improve quality their HIV training. Demand side requests may create faster changes. And in case they choose, despite the legal and economic arguments, to continue pre-employment HIV testing at minimum they should demand the clinics to provide a proper counseling for every HIV test taken, because the counseling is likely influence risk behavior of the seafarers.

¹⁰³ International Labour Organization, 2009, Mandatory HIV testing for employment of migrant workers in eight countries of South-East Asia: From discrimination to social dialogue. Available at http://www.ilo.org/wcmsp5/groups/public/---asia/---ro-bangkok/---sro-bangkok/documents/publication/wcms_112972.pdf

9 Limitations

This analysis comes with a certain limitations. Firstly despite of the large number of HIV tests done for seafarers, the actual HIV prevalence in the maritime workforce remains unknown. Changes in the prevalence may have an impact on the projected number of new infections. In addition only HIV infections among seafarers and their spouses are included in the analyses. The model does not capture transmissions from or to the general population.

Secondly, detailed costing information on the current HIV prevention activities and costs of HIV/AIDS for society and shipping companies was not always available. For that reason some of the variables rely on expert opinions and estimations. Furthermore cost-benefit analyses come with a measurement problem, which often means that a range of costs and benefits cannot be valued in monetary terms. Therefore some of the potential inputs needed to be excluded from the analysis.

Thirdly, estimated behavior change impacts of the proposed new interventions are based on literature review on studies conducted in other countries. Fourthly, the mathematical model does not take into account of the distribution individual behavior within the risk groups, but treats the target populations as homogeneous groups. Moreover it does not take into account how demographic, social, geographic and economic variables may influence on HIV transmissions.

Despite of these limitations we are confident that the results are a good trend indicator on cost-effectiveness of the different HIV prevention strategies and represent the HIV/AIDS epidemic among Filipino seafarers and their spouses well. Furthermore the results are very suitable for supporting decision making and program planning in the maritime sector.

9.1 Generalizability of the results

The forecast was developed especially for the situation in the Philippines. Therefore there are a number of reasons why the results may not be directly transferable to other program settings or countries: 1) HIV prevention in the maritime sector in the Philippines has some unique characteristics: mandatory HIV education for all departing seafarers, the large scale mandatory HIV testing and non-employment of HIV positive seafarers, 2) HIV prevalence among Filipino seafarers and their spouses is currently low, 3) Program costs and monetary value of benefits of HIV prevention program are likely to differ from country to country. Therefore, we recommend decision-makers in other countries to use the same methodology updated with their HIV/AIDS epidemic and costs information. For further information contact ILO office or the author.

10 Conclusion

The good news seems to be that the HIV prevalence is relative low among Filipino seafarers and their spouses. However, this is not a reason for inaction, because results of several studies indicate that Filipino seafarers continue their high-risk sexual practices despite of the on-going HIV prevention programs. Therefore there is need for concentrated efforts to change this development.

The projections indicate that there would be 450 new HIV infections in the target populations of the study during the period 2010 – 2015. This is relatively low number. Alarmingly the majority (59%) of new HIV infections would be spousal transmissions. Especially spouses of former seafarers seem to be at risk. The number of former seafarers is gradually increasing and simultaneously more spouses come at risk. The current workplace HIV interventions are focused on prevention of new infections among the maritime workforce. Little attention is paid for the spouses.

From the economic point of view of this study the resources used for the current short 10 – 20 minutes long PDOS HIV/AIDS module seems create little or no return on the investment. The results suggest that the improved PDOS HIV module would have the potential to prevent 32% of infections in the maritime workforce at lowest costs of the analyzed interventions. Therefore, it would be the best choice for investing the limited resources. The second best choice would be spend funds on peer-education for spouses. On-board peer education and voluntary post-employment HIV testing would also produce better return than the current setting.

The not so good news is that the low incidence means that there are not many new HIV infections “to be prevented”. The cost of implementing a prevention program is independent from the number averted infections. In other words, the cost of a similar prevention campaign in a high prevalence country will be the same, but the number of averted infections is likely to be higher. Consequently, prevented HIV infections among Filipino seafarers and their spouses come at a cost. The improved PDOS HIV module would become cost-neutral, if seafarers’ condom use with CSWs increased from 53% to 72%. Other interventions create a net loss from the societal perspective. The large scale mandatory pre-employment HIV testing is the most expensive and the least cost-effective strategy. In addition, as a purely workplace HIV prevention measure it is ineffective intervention, because it does not avert HIV infections in the maritime workforce.

Currently the HIV/AIDS epidemic seems to have a very limited impact on a typical shipping company in the Philippines. A company with 220 crew members is likely to have one to two HIV infected seafarers 2010 - 2015. The results suggest that it would be cheaper for the shipping companies to employ HIV+ employees than continue paying for the pre-employment HIV testing. However, this equation may change if the HIV prevalence in the maritime workforce increases. Therefore it would be important that the shipping companies use their resources on HIV prevention instead of HIV testing. Finally, the HIV/AIDS epidemic in the maritime sector seems to have a minor impact on macro-economic level in the Philippines. HIV infected seafarers are likely to be replaced by another Filipino seafarer. Therefore, on a macro level the flow of remittance and tax income remain constant. However, it is important to remember that on individual and family levels financial consequences of the disease are grave.

11 Recommendations

Based on the findings of this study and issues that appeared during the process the following recommendations are made for:

11.1 Improve impact of PDOS HIV module

The results of the Asian Development Bank's 2009 KAP survey suggest that the currently common 10 - 20 minute version of PDOS HIV/AIDS module has not been very effective in increasing seafarers' condom use and decreasing number of sex partners¹⁰⁴. On the other hand, findings of this study suggest that, if the content and implementation of the PDOS HIV/AIDS module are improved, the intervention has the potential to produce good return for the investment. These improvements will require additional resources and efforts, but this seems to be money well spent. The existing PDOS has an impressive coverage, reaching 92% of the departing seafarers. Program planners should definitely utilize this. Therefore we recommend, as several other studies do, revision of the content and delivery of the PDOS HIV/AIDS module.

11.2 Prevention interventions for spouses

The results indicate that the majority 59% of the projected new infections would be spousal transmissions 2010 - 2015. The group is currently not been reached by any large scale prevention interventions. There is an urgent need to develop and scale-up prevention programs aimed for the spouses of seafarers. The most affected group seems to be spouses of former seafarers. The special challenge is how to reach this group. The result of this study could be used to advocate and lobby for prioritizing and fundraising for interventions aimed for the spouses of current and former seafarers.

11.3 Abolish mandatory pre-employment HIV testing

First of all mandatory HIV testing is illegal in the Philippines. Therefore mandatory pre-employment HIV testing is also illegal, even if it is done at the request of a foreign entity. All the parties involved should comply with the legislation and the competent authorities should enforce the law.

Secondly there are economic reasons that lobby against the large scale mandatory pre-employment HIV testing of Filipino seafarers. The large scale testing is expensive and the benefits are limited. The number of detected HIV cases is low, due to the low HIV prevalence and incidence among the Filipino seafarers. The results suggest that the cost of detecting an HIV+ seafarer is higher than a long-term cost increase of employing him. In addition, as a purely workplace HIV prevention measure the pre-employment HIV testing is ineffective intervention, because it does not avert HIV infections in the maritime workforce.

For these reasons we recommend shipping companies to move away from the mandatory pre-employment HIV screening and invest instead to e.g. facilitating on-board HIV peer education and

¹⁰⁴ Asian Development Bank, 2009, Seafarers' Knowledge, Attitudes, Practices, Vulnerabilities, and Risks to HIV

condom distribution or improving quality of PDOS HIV module. These interventions are likely to produce better value for their money, because these help preventing the epidemic spreading further among their Filipino workforce. Other practical step that the shipping companies could take is to request manning agencies to improve quality their HIV training.

11.4 HIV prevalence data

Despite of the large number of HIV tests done for Filipino seafarers, the actual HIV prevalence in the maritime sector remains unknown. As far as the author is aware, the Philippine HIV and AIDS registry does not differentiate sea- and land-based OFWs. Seafarers are such a large risk group in the Philippines that it would be important to determine the scale and monitor trends of the epidemic. Furthermore, the register does not capture information on the extent of spousal transmissions¹⁰⁵. The lack of this information makes priority settings for HIV prevention interventions difficult. It would be important to enhance the data collection to capture information on spousal transmissions, especially now when the results this study suggest increasing spousal transmissions in the maritime sector.

¹⁰⁵ UNAIDS, 2009, Country Assessment of Spousal Transmission of HIV in the Philippines.

12 Acknowledgements

The author would like to express his gratitude for support of Jesus Macasil and Gwendolyn Fabros at International Labour Organization office in Manila and thank representatives of Action for Health Initiatives Inc., Associated Marine Officers' and Seamen's Union of the Philippines, Department of Health, Department of Labor and Employment, Filipino Ship-owners Association, International Maritime Organization, Magsaysay Lines, Inc, Maritime Industry Authority, Overseas Workers Welfare Administration, Pandiman Philippines Inc, Philippine Overseas Employment Agency, Philippine Ports Authority, Philippine Seafarers' Union, Philippine Transmarine Carriers Inc., Physician' Diagnostic Services Center Inc., Seamen's Hospital, Trade Union Congress of the Philippines and UNAIDS for their co-operation.

Jari Kivela
in Amsterdam November 2009
jari.kivela@Qalys.eu

13 Additional chapter: Legal framework for HIV/AIDS in workplace

The Philippines has a national law on AIDS prevention. Even though legal aspects of HIV at the workplace in the Philippines were not within scope of the original terms of reference of this assignment, it was felt important to highlight the legal aspects of mandatory HIV testing of seafarers and discrimination on basis of HIV status, because these are interlinked with the results and recommendations of the study.

Currently it is a common practice to require Filipino seafarers to take a HIV test before a new contract. If a seafarer is tested HIV positive, he or she is likely not to be re-employed. According to national and international legislation, mandatory HIV testing and denial of employment on grounds of a person's HIV status are illegal.

13.1 National legislations: the Philippine AIDS Prevention and Control Act

The Republic Act 8504, The Philippine AIDS Prevention and Control Act of 1998 enacts the following on compulsory HIV testing and discrimination in the workplace¹⁰⁶.

ARTICLE III

Testing, Screening and Counselling

SEC. 16. Prohibitions on Compulsory HIV Testing – Compulsory HIV testing as a precondition to employment, admission to educational institutions, the exercise of freedom of abode, entry or continued stay in the country, or the right to travel, the provision of medical service or any other kind of service or the continued enjoyment of said undertakings shall be deemed unlawful.

ARTICLE VII

Discriminatory Acts and Policies

SEC. 35. Discrimination in the Workplace – Discrimination in any form from pre-employment to post-employment, including hiring, promotion or assignment, based on actual, perceived or suspected HIV status of an individual is prohibited. Termination from work on the sole basis of actual, perceived or suspected HIV status is deemed unlawful.

ARTICLE VII

Discriminatory Acts and Policies

SEC. 42. Penalties for Discriminatory Acts and Policies – All discriminatory acts and policies referred to in this Act shall be punishable with a penalty of imprisonment for six (6) months to four (4) years and a fine not exceeding Ten thousand PHP (P10,000.00). In addition, licenses/permits of schools, hospitals and other institutions found guilty for committing discriminatory acts and policies described in this Act shall be revoked.

Furthermore, the Act enacts the following on HIV/AIDS Education in the Workplace

SEC. 6. HIV/AIDS Education in the Workplace – All government and private employees, workers, managers, and supervisors, including members of the Armed Forces of the Philippines (AFP) and

¹⁰⁶ The Republic Act 8504, The Philippine AIDS Prevention and Control Act of 1998

the Philippine National Police (PNP), shall be provided with the standardized basic information and instruction on HIV/AIDS which shall include topics on confidentiality in the workplace and attitude towards infected employees and workers.

13.2 International legislation: the Universal Declaration of Human Rights

Article 23(1)

*Everyone has the right to work, to free choice of employment, to just and favourable conditions of work.*¹⁰⁷

The right to work entails the right of every person to access to employment without any precondition except the necessary occupational qualifications. This right is violated when an applicant or employee is required to undergo mandatory testing for HIV and is refused employment or dismissed or refused access to employee benefits on the grounds of a positive result¹⁰⁸.

Based on the above interpretation, the mandatory HIV testing as a precondition of employment is illegal in the Philippines and almost all flag countries where Filipino seafarers are employed.

¹⁰⁷ Article 23, of the Universal Declaration of Human Rights

¹⁰⁸ UNAIDS (2006), International Guidelines on HIV/AIDS and Human Rights

14.1.2 Improved PDOS HIV module

The values within brackets show the movement from the values used in base-line. Other parameters of this scenario are the same as the base-line in chapter 14.1.1.

Group	Condom use
Current seafarers	71% (+18%) 127

14.1.3 Pre-employment HIV testing

Group	Pre-employment HIV test uptake	Condom use of discordant couples
Current seafarers	82.4% 128	69% (+60.7%) 129, 130
Spouses of current seafarers		69% (+60.7%) 129,130

14.1.4 Peer education and condom distribution on-board

Group	On-board peer education uptake	Condom use of those reached	Risk group
Current seafarers	10% 131	70% (-17%) 132	38% (-5%) 133

¹²⁷ Condom use level where the intervention would become cost-neutral

¹²⁸ Saniel O, 2009, HIV Prevalence, Knowledge, Attitudes and Practices Among Seafarers in Bohol Province

¹²⁹ Allen S et al, 1992, Effect of serotesting with counselling on condom use and seroconversion among HIV discordant couples in Africa

¹³⁰ Roth DL, Stewart KE, Clay OJ, et al. Sexual practices of HIV discordant and concordant couples in Rwanda: effects of a testing and counselling programme for men. Int J STD AIDS 2001;12:181–8.

¹³¹ Program coverage used for costing

¹³² Lowndes C et al, 2007, Interventions among male clients of female sex workers in Benin, West Africa: an essential component of targeted HIV preventive interventions, Sexually Transmitted Infections 83: 577–581

¹³³ Author's estimation

14.1.5 Voluntary post-employment HIV test and STD screening

Group	Post-employment HIV test uptake	Condom use of discordant couples
Current seafarers	10% ¹³⁴	69% (+60.7%) ^{135, 136}
Spouses of current seafarers	n/a	69% (+60.7%) ^{135,136}

14.1.6 Peer education for spouses

Group	Peer education uptake	Spouses demanding 100% condom use or HIV test	Condom use of those reached
Spouses of current seafarers	20% ¹³⁷	5% ¹³⁸	20% (+11.7%) ¹³⁸

¹³⁴ Coverage used for costing; 10% of the seafarer who engaged to high risk behavior during their last contract

¹³⁵ Allen S et al, 1992, Effect of serotesting with counselling on condom use and seroconversion among HIV discordant couples in Africa

¹³⁶ Roth DL, Stewart KE, Clay OJ, et al. Sexual practices of HIV discordant and concordant couples in Rwanda: effects of a testing and counselling programme for men. Int J STD AIDS 2001;12:181–8.

¹³⁷ Program coverage used for costing

¹³⁸ Author's estimation