

**FACTORS RELATED TO FERTILITY DESIRES OF HIV
POSITIVE WOMEN LIVING IN THE WESTERN HIGHLANDS
PROVINCE OF PAPUA NEW GUINEA**

MARIE LUCY ASKA

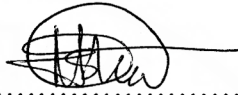
**A THESIS SUBMITTED IN PARTIAL FULFILLMENT OF
THE REQUIREMENTS FOR THE DEGREE OF
MASTER OF PRIMARY HEALTH CARE MANAGEMENT
FACULTY OF GRADUATE STUDIES
MAHIDOL UNIVERSITY**

2010

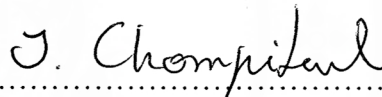
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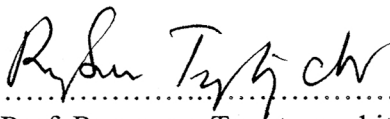
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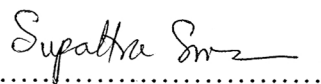
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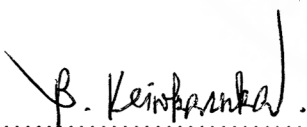
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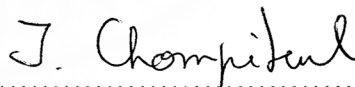
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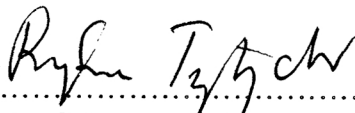
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ACKNOWLEDGEMENTS

Thank you, Heavenly Father and His Most Holy Son Jesus Christ for giving me knowledge and strength to complete this study. It is all in You, through You and for You, Lord.

I would like to firstly express my deepest sincere gratitude to the women living with HIV/AIDS in the Western Highlands of Papua New Guinea for their openness and participation in this study. They were truly very brave to openly discuss their personal lives with me.

I also express my deep sincere gratitude and appreciation to my major advisor, Associate Professor Jiraporn Chompikul, Ph.D. for her valuable guidance, professional advices, especially in the statistical analysis her unending supervision and time for me throughout this study. My appreciation and gratitude to my co-advisor, Associate Professor Boonyong Keiwkarnka, Dr.P.H and my external advisor, Professor Sirikul Isaranarug, M.D., Dip. Thai Board of Pediatrics, for their valuable and professional suggestions and advice in my thesis preparations.

I would like also to thank all the staff of Tininga and Rebiamul Clinics for their help in the data collection, especially my research assistance Miss Jessica Aska and mama Susan Taia.

I am very grateful to World Health Organization (WHO) and Papua New Guinea National AIDS Council Secretariat (NACS) for their partial financial support. Finally, to my family, friends and classmates, thank you for your support and encouragements throughout my stay in Thailand.

Marie Lucy Aska

FACTORS RELATED TO FERTILITY DESIRES OF HIV POSITIVE WOMEN LIVING IN THE WESTERN HIGHLANDS PROVINCE OF PAPUA NEW GUINEA

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ABSTRACT

A cross-sectional descriptive study was conducted to investigate factors which may relate to fertility desires of HIV positive women living in the Western Highlands Province, Papua New Guinea. The aim of this study was to identify socio-demographic, medical, cultural, psycho-social, interpersonal and religious factors which predict fertility desires, and to describe the reasons for and against fertility desires of these women who live in a male dominated patrimonial society. Data collection was conducted in February 2010. Two hundred and ninety one HIV-infected women participated in one on one interviews using questionnaires. The data was analyzed with descriptive statistics using percentage and mean and inferential statistics using Chi-square test, and logistic regressions to find association strength and predictors of fertility

A majority of the participants had polygamous relationship backgrounds, were illiterate subsistence farmers, and were earning very low incomes. 34% of the participants desired a child in the future. In simple logistic regression, variables associated with desire for a child included age, marital status, number of children, currently living with partner, the period of time with partner, receipt of bride price payment, domestic physical violence, sexually active in last three months, partner's desire for a child, and current contraceptive use. In multiple logistic regression, predictors for wanting a child were: younger ages (OR5.51 for age 18-25 years, OR 4.37 for age 26 -35 years.), no children (OR = 3.63), and partner's desire for a child (OR = 13.04). No variables related to medical factors were significantly associated with fertility desire and participants felt there was poor reproductive health care service in the clinics. The commonest reason for desiring a child was "to leave something of their own selves, their 'name' and lineage behind when they die."

The finding shows that culture and social customs influence fertility desires. An integration of reproductive healthcare and family planning service in HIV clinics is recommended. Health care workers are also recommended to counsel clients using a more holistic approach and not just a medical perspective.

KEY WORDS : FERTILTY DESIRE / HIV POSITIVE WOMEN / WESTERN HIGHLANDS PROVINCE / PAPUA NEW GUINEA

171 pages.

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LIST OF ABBREVIATIONS

AIDS	:	Acquired Immuno-deficiency Syndrome
ART	:	Antiretroviral Therapy
EHP	:	Eastern Highlands Province
HIV	:	Human Immuno-deficiency Virus
MTCT	:	Mother to child HIV transmission
NACS	:	National AIDS Council Secretariat
NDOH	:	National Department of Health
PMTCT	:	Prevention of Mother to child Transmission
PNG	:	Papua New Guinea
RNA	:	Ribonucleic acid
SHP	:	Southern Highlands Province
WHP	:	Western Highlands Province
WLHA	:	Women living with HIV/AIDS
WHO	:	World Health Organization
UNAIDS	:	The Joint United Nations Programme on HIV/AIDS
USA	:	United States of America
UNGASS	:	United Nations General Assembly Special Session

CHAPTER I

INTRODUCTION

1.1 Rationale and justification of the study

Women of reproductive age constitute one of the fastest growing groups being infected with HIV/AIDS according to UNAIDS (1). In the last decade, as treatment for HIV has improved and become widely available, there has been increasing interest in the reproductive desires and behaviour of women living with HIV/AIDS (WLHA) and the implications of such desires and behaviours for mother to child transmission.

Like any other women, WLHA have the right to safe sexual and reproductive health. Denying an HIV woman access to reproductive health services is a violation of the reproductive right (2). Historically, ethical and clinical concerns of vertical transmission and the general health of HIV positive women were of great concern to health care providers. Thus, pregnancy was advised to be discouraged or delayed until a later date when more information might be available from research (3). This, however, is not the case now; today more and more HIV positive women are living longer healthier lives and are expanding their productivity (4, 5). Vertical transmission of HIV infection has been tremendously reduced by the introduction of Zidovudine prophylaxis (6, 7). WLHA now have greater autonomy with respect to their reproductive choices as the world advances in technology and knowledge.

This poses a dilemma concerning their sexuality, fertility and its outcomes. As a study in the United States of America (USA) shows, women are in a no win situation when faced with reproductive decisions in the midst of their HIV infection (8). HIV positive women have to decide whether to follow their personal desires to

fulfil their natural motherhood experience and expectations. However, at the same time they fight psychological condemnation and stigma in their community regarding HIV infection and fertility. Moreover, many women struggle with the decision of reproduction, pregnancy and the fear of vertical transmission (8, 9). These women also have to cope with the realization that because of HIV/AIDS, they cannot be the kind of mother for their children that they would prefer. Many will have to accept the knowledge that at some time in the near future their children might become orphans.

Despite this dilemma faced by WLHA in the reproductive age group, a review of studies around the world has shown that HIV positive women still express their desire to bear children after learning their status (10, 11). In Northeast Brazil 40% of HIV women desired a child out of a sample of 229 (12), and the studies of Chen et al produced similar findings in the USA (13, 14). Chen's sample, which was representative of the USA showed that 29% of the WLWHA desired having children despite their HIV status (13).

Though the majority of WLHA choose not to become pregnant (9), studies have showed women becoming pregnant after receiving their HIV diagnosis, regardless of the risk of sexual and vertical transmission (9, 15). 28% of WLHA in four states of Australia (16), and 23% in New Jersey, USA (17), became pregnant after knowing their HIV status (8). Though the birth rates are lower compared to the general women population (16), it seems to be decreasing in France (18) and unpredictable in the USA (15). The actual reason why HIV women still become pregnant is still an issue, and the rates differ in different countries.

HIV infection has added complexity to decisions about childbearing and has influenced fertility desires of these groups of women depending on personal, social and biomedical factors (19). Craft, Delaney, Bautista, et al also confirmed the three main factors by outlining the main factors influencing decisions of reproduction in WLHA as follows 1, personal health related concerns: 2, society influences: 3, social network support, and 4, procreative predisposition (9).

Siegel and Schrimshaw in their explorative study showed that the most common reasons for having a baby by WLHA were personal desire, a partner's desire for a child, to experience motherhood, meaning for life on earth and a feeling of completion of life. They further outlined findings of justification for the women's reasons. The most common four justifications included one, faith in God to protect their child from infection; two, other HIV infected women are having healthy babies; three, having hopes due to zidovudine prophylaxis; and four, currently having good personal health may help prevent infection to their babies (20). Negative public opinion and negative attitudes of health care givers were seen as a strong negative social force against desires about pregnancy (21).

The studies carried out were mainly based in westernised countries, whose their health systems, standards of living, economy, cultures and beliefs are not really applicable to the culture and context of developing countries. Psychosocial and cultural factors differ from country to country, and greatly influence reproductive decisions of WLHA in addition to biomedical factors (17). Papua New Guinea (PNG) is known to be one of the world's most diverse cultural countries. It is a strongly male dominated society, with cultures of bride price payments, polygamous marriage and social domestic violence, all of which may have an impact on fertility decisions. These cultures are less common in other developing countries, or even unheard of in wealthy countries like the USA.

These issues make PNG unique. Thus, in comparison to western countries, WLHA in PNG may face different issues that may relate to their reproductive choices. As Antiretroviral therapy (ART) and prevention of mother to child transmission (PMTCT) services are currently being implemented across the country, now in their fifth year (22). It is being observed that HIV positive women are becoming pregnant. As of today, there have been no studies done in PNG in relation to fertility desires, or even related to reproductive health issues of HIV positive women. Therefore, there is ample need for this study and, as it is the first of its kind in the country, it may we establish baseline for later related studies.

As it is becoming increasingly important to address the issue of reproductive counselling and management of HIV individuals during their reproductive years, it is also important to understand the issues and factors that relate to their fertility desires.

This study examines the effects of socio-demographic, bio-medical, psycho- social, interpersonal, motherhood and cultural factors relating to Highlands women of PNG living with HIV on their fertility desires, as they face the challenges of living with the infection in a strongly male dominated cultural society.

1.2 Research questions

1. What is the fertility desires among HIV positive women living in the Western Highlands Province of PNG?
2. What factors relate to the fertility desires of HIV positive women living in the Western Highlands Province of PNG?

1.3 Research Objectives

1.3.1 General objectives

To study factors that relates to the fertility desires of HIV positive women living in the Western Highlands Province of PNG.

1.3.2 Specific objectives

1. To describe the fertility desires of HIV positive women living in the Western Highlands Province of PNG
2. To describe the socio-demographic, medical and cues to action, cultural, psychosocial, interpersonal and religious factors that are related to the fertility desires of HIV positive women living in the Western Highlands Province of PNG.

3. To describe the concerns or fears of HIV positive women living in the Western Highlands Province of PNG about not wanting a child.

4. To describe why HIV positive women living in the Western Highlands Province of PNG want to have a biological child

5. To identify the relationship between fertility desires and socio-demographic, medical and cues to action, psychosocial, cultural, interpersonal and religious factors of the HIV positive women living in the Western Highlands Province of PNG.

6. To examine significant predictors of fertility desire

1.4 Conceptual framework

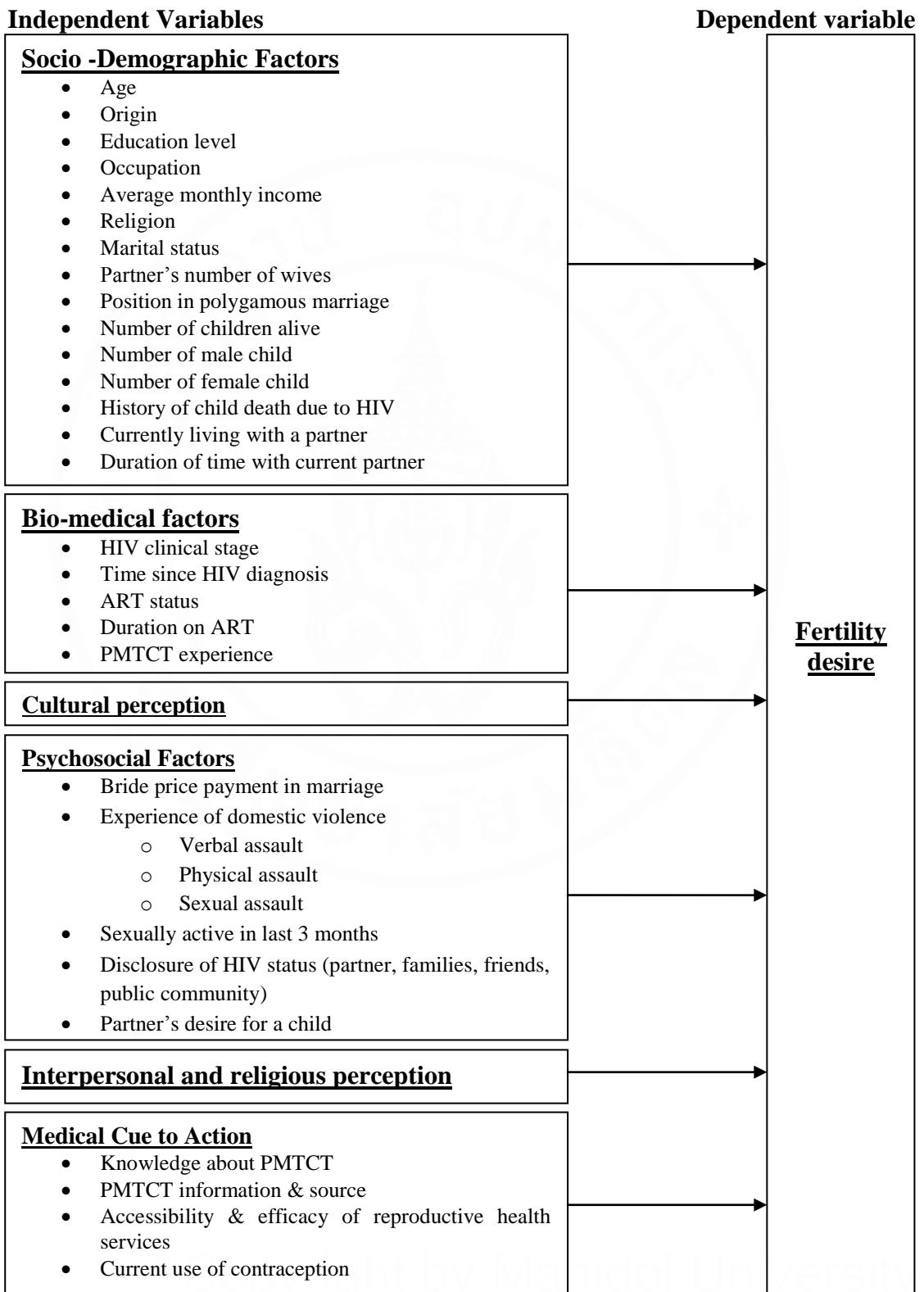


Figure 1.1 Conceptual framework

1.5 Operational definitions

1.5.1 Dependent variable:

Fertility Desire: refers to a respondent's desire or intention to have a biological child. For the purpose of this study desire and intention are combined as fertility desires. Desires is defined as a psychological state that represents what someone wishes for or wants. Intentions are psychological states that represent what someone actually plans to do. They are based on *desires* but take into consideration what others desire and what can actually be achieved. (See page 32 for more elaboration)

1.5.2 Independent variables

Age: age was determined as the complete years of a respondent at the time of interview.

Origin: refers to respondent's province of origin

Level of education: this refers to the highest level of education in which the respondent may have passed an examination or successfully completed a course requirement.

Occupation: Occupation was defined as the jobs of the respondents. It is categorised into five.

A subsistence farmer or gardener refers to a respondent who does domestic farming of garden foods for self consumption, not farming business.

Labourer refers to a respondent who is working at unskilled, manual work in a company plantation or industry.

Government or private company employee refers to a respondent who has a qualified job with the government or a private company.

Small business refers to a respondent who owns or runs a small regular business, and may include a trade store, chicken farming, crop farming or buying coffee beans.

House wife: refers to a respondent who is just at home looking after their children or household while the husband or partner is working.

Income per month: refers to the estimated income earned by a respondent in a month. K stands for Kina, the monetary unit of PNG.

Religion: this is a respondent's religious Christian denomination.

Marital status: refers to a respondent's marital status and was categorised as:

Married was defined as being married according to custom, legally or in a church and currently living with husband

Cohabiting with an un-married partner; refers to a de facto relationship where a respondent is living with a partner although, not legally married. In PNG, when a woman and man live in the same house and have an intimate relationship together, they are referred to as being married even though it is not by law or customary arrangement. This is explained by the low economic state of the country, where hosting a wedding or even paying a bride price is a very expensive practice which most couples cannot afford. The study aims to capture the picture of couples living together and having an intimate sexual relationship. Thus, being married and cohabiting with a partner have been combined as one variable.

Divorced or separated: this refers to a respondent who has been married but is no longer living with their partners, whether they are been divorced formally or are separated.

Widowed: this refers to a respondent whose husband has died.

Partner's number of wives: refers to the number of wives the respondent's partner as if practising polygamous marriage.

Position in polygamous marriage: this refers to the rank of the respondent as the wife if in a polygamous marriage i.e., whether first wife, second wife, or third or subsequent wife.

Number of children alive: refers to a respondent's number of biological children alive.

Number of male child refers to the number of male child the respondent has in her family.

Number of female child: refers to the number of female child the respondent has in her family.

History of child death due to HIV: refers to a respondent who had a child that died due to HIV infection.

Currently living with a partner: refers to the current status of the respondent whether she is currently living with a male partner despite her marital status.

Duration of time with current partner: this refers to the period of time the respondent has been living with her current partner.

HIV clinical stage a respondent's highest stage of HIV disease since her diagnosis was noted and was categorised in the four stages according to World Health Organisation (WHO) criteria for clinical and immunological of staging HIV disease in adults was used. A more detailed outline of the classification of the diseases is contained in appendix B.

Time since HIV diagnosis: refers to the time from which the respondent was diagnosed with HIV to the time of interview.

ART status: refers to whether a respondent had received antiretroviral therapy (ART), or not, at the time of interview. This does not include the status of antiretroviral therapy for prophylaxis for PMTCT intervention.

Duration on ART: This refers to the period of time during which the respondent had been on ART, up to the time of interview.

PMTCT experience : refers to whether a respondent has ever experienced PMTCT service i.e. ART prophylaxis for her or her baby, and delivered a baby in a health care setting or other PMTCT intervention methods used to delivery her baby, and whether the babies were positive or negative or yet to be tested.

Cultural perception: refers to a respondent's view of what she thinks about certain cultural practises. Items in the questionnaire include statements about, respondent's opinion about male dormancy society, polygamy, bride price payment, domestic violence and community expectation and perceptions of fertility and infertility.

Bride price payment in marriage: refers to whether a respondent's family received a bride price payment from her husband's family when she got married to her partner.

Experience of domestic violence: refers to a respondent's own experiences of being physically, verbally or sexually abused by her partner since she was diagnosed with HIV. Definitions:

Physical abuse: Means using physical force such as pushing, shoving, hitting, kicking, choking, and using weapons.

Verbal abuse: means calling names, swearing, putdowns in front of others, creating a fear and not allowing her to make choices.

Sexual abuse/assault: is when the partner forces the respondent to have sex when she doesn't want to.

The definition is adopted Lewis, Maruia and Walker paper "Violence against women in Papua New Guinea" 2007 (23).

Sexually active in last 3 months: refers to a respondent's sexual experience or activity whether vaginal or anal sex, with in the last 3 months prior to the interview.

Disclosure of HIV status: refers to the respondent's disclosure of her status to people apart from the health care worker. This includes disclosure to:

- a. No one yet
- b. Her partner refers to the partner. .
- c. Her immediate family, which includes her parents and siblings
- d. Partners' immediate family, which may include his parents or siblings.
- e. A trusted friend: someone she trusts apart from immediate family or partner for example, a workmate, church mate, or a close friend
- f. Public community. The disclosure to the public refers to other people apart from the respondent's family this may involve the village community or the neighbours as well as the general public.

Partner's desire for a child: refers to a respondent's intimate partner's desire or intention for a child, he may have mentioned to her.

Interpersonal and religious perception: refers to a respondent's belief and perception on motherhood, the reasons for being a mother and also her religious belief that God has His own plan and can help prevent the baby to being positive or that whatever the outcome it was God's plan.

Knowledge about PMTCT: refers to the respondent basic knowledge about PMTCT.

PMTCT information and sources: refers to whether the respondent has heard about PMTCT, and from whom. These includes may hearing from the health care workers, media awareness, publication in books, booklets, brochures and from peer PLWHA women, or even witnessing experiences from peer PLWHA about MTCT and PMTCT programs

Accessibility & efficacy of reproductive health care services: refers to a respondent's experience of being given or offered reproductive counselling by the

clinic staff, and or given family planning services e.g. providing condoms or advice for referral to a family planning clinic, and also the opinion of a respondent, about the health workers' roles, tasks and attitudes to the respondent in reproductive health concerns in a health facility

Current use of contraception: refers to whether the respondent's was currently using a contraception or family planning at the time of interview.

Concern or fears against fertility desire: refers to a respondent's main reason (s) why she did not want to have a child.

Reason for positive fertility desire: refers to a respondent's main reason (s) for desiring to have a child.

Fertility desire if in the absence of HIV: this refers to the respondent's fertility desire currently if in the case that she had a negative HIV status.

1.6 Limitation of the study

The major limitation was that, it was a cross sectional study and that it was not able to capture the potential changes in fertility desires of these HIV positive women in this setting over time. This also limits the ability to also establish causation.

Some questions are author derived depending on the country's culture thus have no comparisons for reliability and validity. In this study, as our recruitment was based in an HIV clinic only, generalising the result to HIV positive women not in a health care is limited. Moreover, women were self selected to participate in this study. For this reason they may be more explosive or outgoing, comfortable, and relaxed to discuss sensitive issues. This may suggest self selection bias.

CHAPTER II

LITERATURE REVIEW

This chapter reviews and elaborates literatures of this study. This chapter outlines 3 main topics as follows;

- 2.1 HIV/AIDS situation & women
- 2.2 Theories: Decision making & fertility
- 2.3 Related studies

2.1 HIV/AIDS situation and women

2.1.1 HIV Global situation

The fight against HIV/AIDS has come a long way since the first AIDS case in the USA in 1981 (24). Much has been said and done as we approach the half way mark since the Declaration of Commitment made in 2001 to reverse the AIDS epidemic by 2015. By December 2007, there were 33 million people living with HIV/AIDS worldwide (25).

The recent UNAIDS 2008 report of the epidemic shows some promising outcomes concerning the global epidemic, as the percentage of people living with HIV/AIDS is stabilising (1). Moreover, the UNAIDS report states that access to antiretroviral therapy (ART) over the last decade has decreased deaths from HIV/AIDS. Global annual deaths to AIDS have decreased by 0.2 million in the last 2 years. Access to ART has increased 10 folds since 2002, and by the end of 2007 three million people were receiving ART globally (1).

2.1.2 HIV Situation among women

Women and HIV/AIDS is still a big problem. The HIV infection rate in women is still high. In 2007, 15.4 million HIV infected persons were women, that is 50 percent of the total number of people living with HIV globally, 1.6 million more, compared to 2001 (25). Over 80% of the infected women are in their reproductive age. The UNAIDS report estimated that 2.5 million out of the 200 million women who become pregnant each year were HIV positive. And of the 14, 000 new infections per day, 1,600 are contracted during pregnancy, childbirth and during the postnatal period(26). It is globally recognized that most women who become infected are poor, venerable and marginalised in their communities.

After the Universal Access Declaration to HIV treatment and prevention in 2006, almost all member countries have developed implementation processes to make antiretroviral therapy and prevention of mother to child programs available to their citizens who desperately need it. Though the speed may be different from country to country, the UNAIDS 2008 global report shows a 25 % increase in pregnant women receiving ART prophylaxis and an increase in the number of women registered for ART over the last 3 years (25).

2.1.3 HIV positive women's reproductive rights

The World Health Organisation (WHO) defines health as the state of complete physical, mental and social well- being and not merely the absence of illness (27). This definition, idealistic as it is, is relevant and applicable to women's health, especially to women infected with HIV because they are faced with untold miseries, including stigma and discrimination. Many women with HIV/AIDS today suffer from community stigma, domestic violence, including emotional, sexual and physical. Gender inequality and human rights violations have fuelled the HIV incidence among women around the world. This connection was explicitly recognized by the United Nations General Assembly Special Session (UNGASS) in its 2001 Declaration of Commitment on HIV/AIDS:

“The full realization of human rights and fundamental freedoms for all is an essential element in a global response to the HIV/AIDS pandemic; including in the areas of prevention, care, support and treatment. it reduces vulnerability to HIV/AIDS and prevents stigma and related discrimination against people living with or at risk of HIV/AIDS” (28).

On March 6th, 2009, Amnesty International released a public statement on World Women’s Day stating that the condition of women is still very poor, and that they still have little or even no access to human rights, which includes equality, education, physical integrity, health care and economic security. They urged appropriate governments to solve these issues facing their countries (29). In some countries women have taken the lead, advocated women’s rights, started crisis centres, passed laws and have worked to change the cultural beliefs and attitudes which underlie gender violence and inequality.

WHO’s constitution states that the enjoyment of the highest attainable standard of health is one of the fundamental rights of every human being (26). All women have the right to health and to be treated with respect; even women living with HIV/AIDS (WLHA) are entitled to the same rights as uninfected women. This includes the right to access sexual and reproductive care, which includes HIV/AIDS prevention and treatment, and also to look after the health of their expected and existing babies. The International Community of Women Living with HIV/AIDS and Amnesty International have developed a mentoring tool to ensure that reproductive health care of women living with HIV is met (29, 30).

Historically, policies in many countries discouraged HIV infected individuals from having children in order to reduce the number of children born with HIV or born to HIV parents. But today, a more flexible approach towards this is emerging. The shift has been mainly informed by the reproductive right approach, universal access to PMTCT interventions and ART (3), and in other developed countries, the availability of assisted reproductive technique for HIV couples (31, 32). All these developments have dramatically reduced the chance of sexual and perinatal

HIV transmission. However, they also generate secondary considerations about fertility desires among women living with HIV and their partners.

2.1.4 HIV and socio- culture in Papua New Guinea

The country of Papua New Guinea is known for its rich diverse cultures and over 800 languages. Cultures and beliefs perceived and practised differ between provinces as well as within provinces making it one of the world's most culturally diverse countries. The population of PNG is estimated to be about 6.5 million of whom 87% live in rural areas with little access to basic health care services due to the difficult terrain of the country (33).



Figure 2.1 Map of Papua New Guinea and its provinces

Source: Google map of Papua New Guinea

Papua New Guinea is a low income country with a strong male dominated society which holds strong its traditional and cultural values and practices. Traditionally, women in PNG are seen as second class and this is quite obvious from

recent national indicators showing 50 % of women are illiterate, with a high fertility rate of 4.8 and a maternal mortality rate of 730 (33).

The epidemic of HIV/AIDS has increased in PNG at an alarming rate. By the end of 2006, a total of 18,484 people had been diagnosed with HIV. Of these infections, 46% were in males, 48% in females, and 6% in individuals whose sex was not reported. Heterosexual sexual intercourse was the commonest mode of transmission (22). The 2007 National HIV report showed that infection in females was highest in younger women aged 19 to 29 years old, at the peak of their reproductive lives (34). At this age, life as adults has just begun, with marriage and childbearing desires in the mind. The reproductive choices of these women are now complicated by HIV infection. One must not forget that these women also live in a male dominated society which holds strong its traditional practice of bride price payments and polygamy especially in the Highlands region, where most of the domestic decision making roles tend to be influenced by their husbands or partners (35).

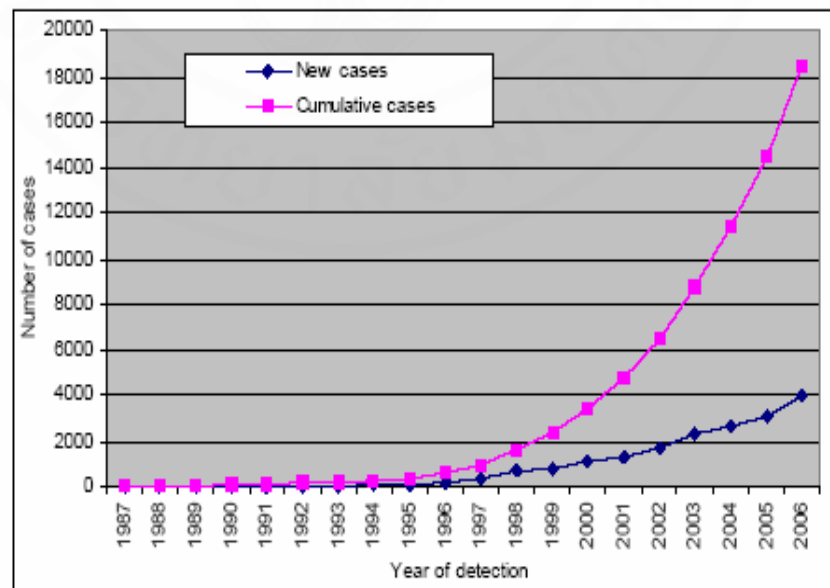


Figure 2.2 New and cumulative annually reported HIV infections in PNG from 1987–2006

Source: NDOH and NACS, 2007 (34)

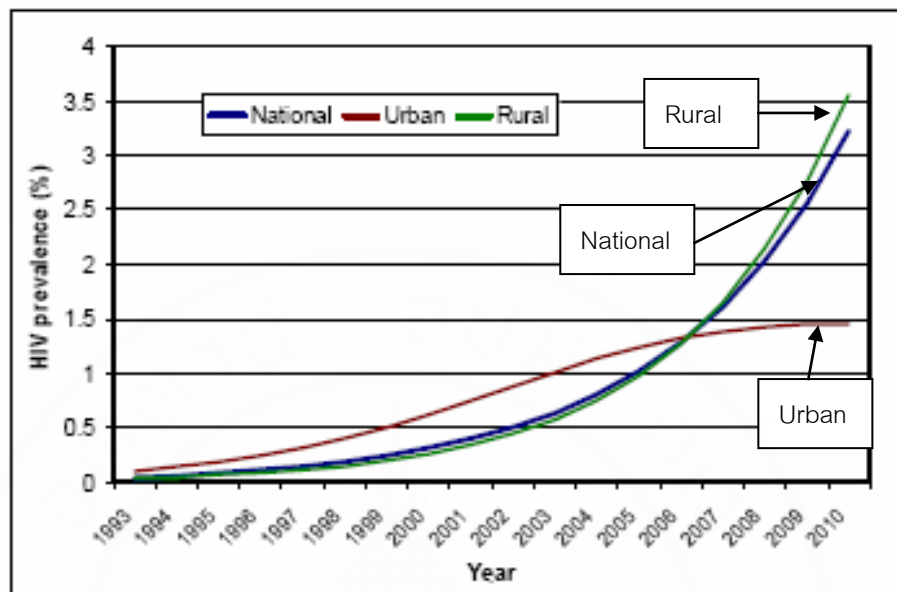


Figure 2.3 Urban, rural and national trends in the HIV epidemic, PNG, 1993-2012

Source: NDOH and NACS, 2007 (34)

Table 2.1 Mode of HIV transmission in PNG, 1987-2006 (reported cases)

Mode of Transmission	Male	Female	Sex not stated	Total	%
Heterosexual	2712	3386	194	6292	34.04
Homosexual	18	8	0	26	0.14
Perinatal	118	97	4	219	1.18
Blood transfusion	0	0	0	0	0
Contaminated needle	0	0	0	0	0
Mode not recorded	5682	5333	932	11 947	64.63
Total	8530	8824	1130	18 484	100.00

Source: NDOH and NACS, 2007 (34)

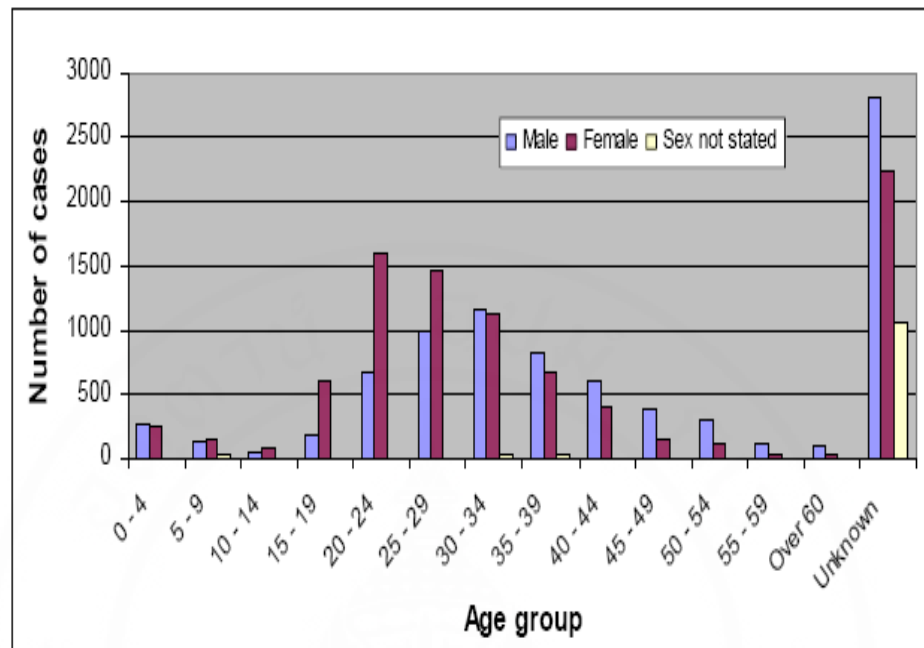


Figure 2.4 HIV infections detected in Papua New Guinea by age, from 1987 – 2006

Source: NDOH and NACS, 2007 (34)

Violence against women in PNG has been an international concern with the HIV epidemic. Amnesty International reported that gender inequities and the prevalence and social acceptance of violence against women in PNG has been identified as one of the major contributing factors towards the rapid spread of HIV/AIDS in the country (35). Most women are victims of rape and domestic violence. A recent study in 2008 of PNG women who attended voluntary testing and counselling centres, showed that 58% had had physical and emotional abuse, 47% financial abuse, 44 % sexual abuse and 38% social isolation in their relationships. They also found that sexual violence in a relationship was strongly associated with being HIV positive (23).

The National HIV response team with the initiative of Australian-Aid in 2006 has carried out a series of sexual behavioural studies surveys. These studies were conducted in four provinces in PNG among high risk groups of people. Western Highlands Province was one of the provinces. Female sex workers, youth in

settlements, military personnel, truckers and men in private industries were interviewed about their sexual behaviours. The study found that 61.4% of married male youth and 49.3% of unmarried male youth had forced partners to have sex with them (22). Sexual violence by intimate partners has become an increasing concern (35) and these studies have shown what women in Papua New Guinea are facing in their relationships. The Papua New Guinea Government has passed a “rape within marriage” law in 2003 (35). However the effectiveness and accessibility of the judicial system is still marginal in the remote regions of PNG. Marital rape in HIV couples is one factor which can be overlooked and this can lead to unwanted reproductive outcomes against their will, as in most cases women tend to say nothing or do not react to sexual violence in their relationship because they may face additional violence or desertion from their partners or husbands if they refuse to have sex. Even to insist on using a condom during sex may bring up accusations of infidelity. (35)

2.1.5 HIV situation in Western Highlands Province

The **Western Highlands Province** is described as the “heart” of Papua New Guinea and the highlands region. This is because of its location and its role in serving the other four highlands provinces, Southern Highlands, Enga, Simbu and Eastern Highlands provinces.

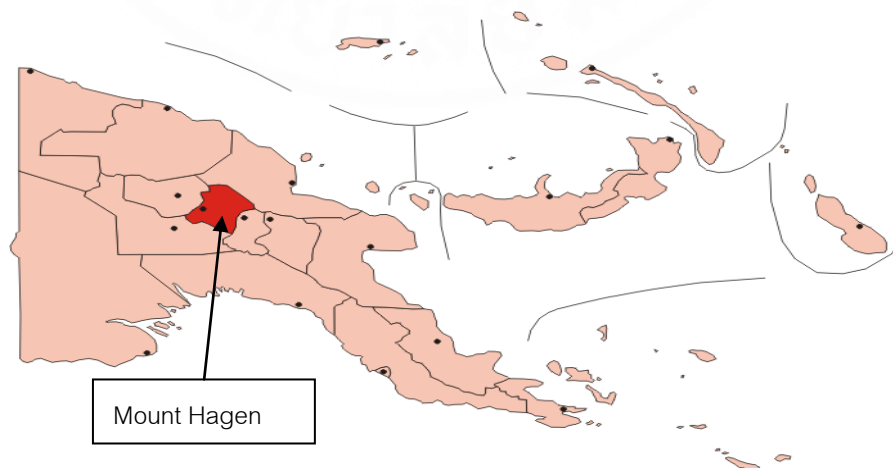


Figure 2.5 Western Highlands Province

Source: Google Map

Copyright by Mahidol University

Mount Hagen is the provincial capital and is located towards the western end of the Waghi Valley at a height of just over 5,500 feet above sea level in the region where there are mountain ranges that range in height from 7,000 to 14,000 feet. The province covers an area of 8,500 km², and there are 440,025 inhabitants (2000 census), with Mount Hagen city estimated to have just over 40,000, making the Western Highlands one of the most densely populated provinces. This figure may have changed dramatically over the last 7 years due to the rapid population growth experienced in PNG. The city is built on a rich plateau surrounded by the ranges, making it a melting pot for commerce and agriculture with its proximity to Simbu, Southern Highlands and Enga provinces linked by road.

WHP has an active labour force of 325,153 with significant a working class base estimated at 68,863 (2000 census). The majority of the population however, is basically involved in the non-monetary subsistence activities.

Although, the WHP tends to attract a small number of foreign direct investments (FDI), most investments in the province are very significant and mostly in agriculture, particularly coffee and tea which create the base for the manufacturing sector mainly in the processing of the two products. All green bean coffee and some tea products are meant for the export market. The province is by far the biggest coffee and tea producer in the country. The other significant economic activities in the WHP are centred on commerce, transport and hospitality sectors owing to its strategically placed location to the rest of the highlands.

Most of the major highlands based transportation; trading and hospitality companies are based in Mount Hagen town. There were intensive signs of informal activities in the province. Even though the village people depend on subsistence gardening to supplement their daily needs, there is significant evidence that local people are actively engaging in commercial activities such as raising chickens, pigs, vegetables and operating Public Motor Vehicles (PMVs). In fact, players in these informal activities apart from meeting their daily needs use their proceeds to conduct these activities with visions to graduate into formal businesses.

According to a UNAIDS information centre online, a report published by the Post Courier, PNG's national newspaper on July 22, 2009 stated that the WHP was the province in PNG with the highest rate of HIV infections. And most of those affected are women aged 15 to 30. A scary 12 per cent of HIV tests conducted on members of the general public in WHP is HIV positive (36).

19.48% of the HIV cases in the country were reported in the WHP with close to half of all HIV cases detected in the Highlands region (22).

Western Highlands has been home to immigrant all over the Highlands region, as the province supports many people because of its strategic location. Skilled or semiskilled workers and labourers have come to work in the many tea and coffee plantations, and Mt Hagen City. Moreover, because most transport operations are located in the WHP, risky behaviour of truck drivers is a common contributor to the increasing HIV incidence (22). The WHP is the centre of an epidemic in the Highlands region.

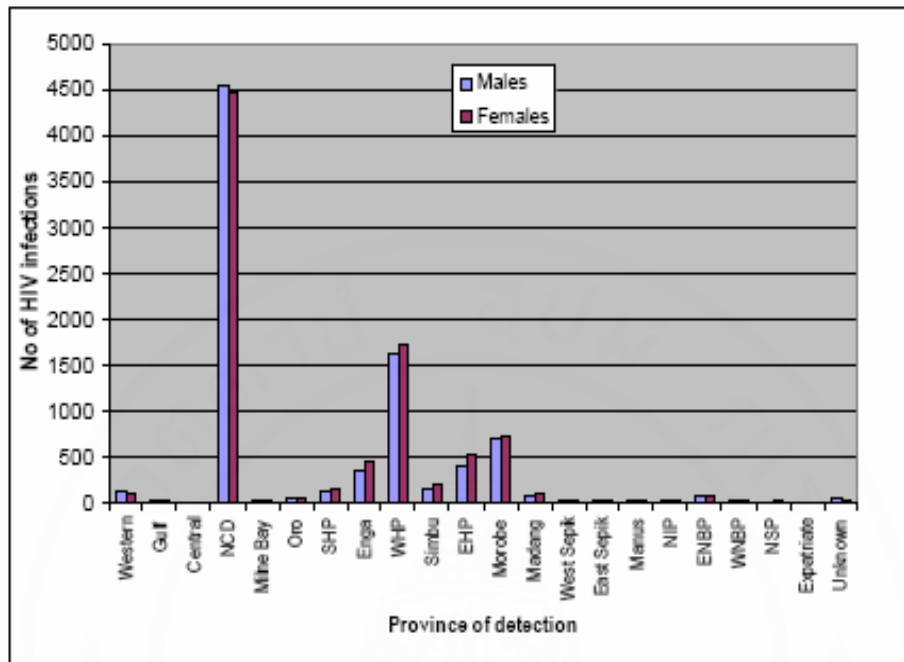


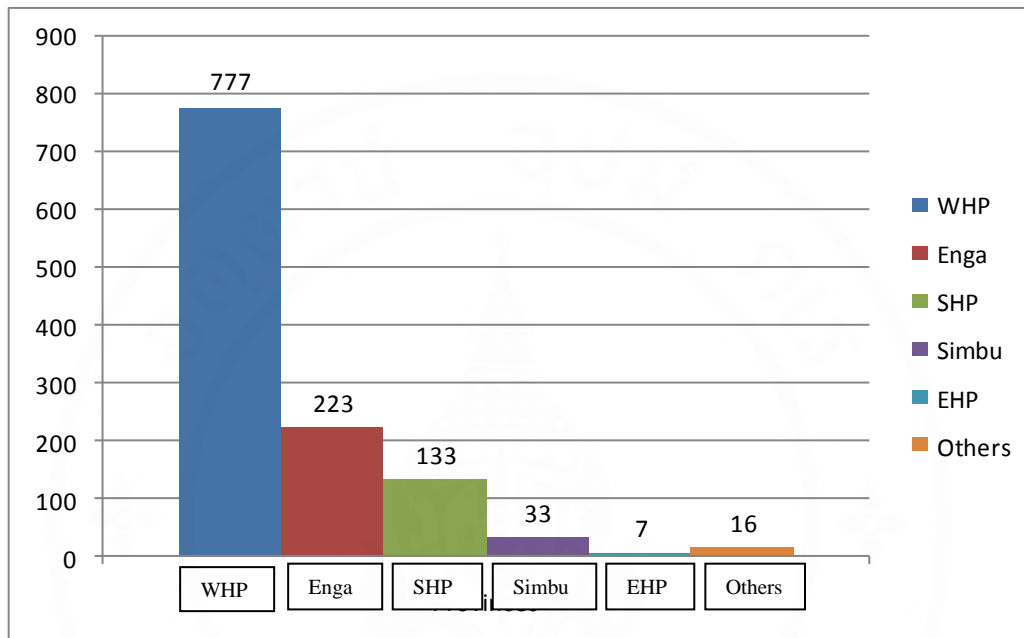
Figure 2.6 HIV infections reported in PNG by province of detection 1987 – 2006

Source : NDOH & NACS, 2007 (34)

The universal access to prevention, treatment and care contained in the HIV Declaration and Commitment made by the member countries of the UNGASS in 2006 (25) has seen a lot of the member countries rolling out strategic policies and implementing services and ART for its HIV infected citizens.

PNG in its national response to the epidemic has taken the challenge and significant efforts have been made to scale up care and treatment services throughout the country since 2005 (34). The country has received substantial funds from the Global Fund to implement these HIV programs and with other partners providing technical support. There has been an enormous scale up and despite the lack of health infrastructures, human resources, and geographical terrains, many lives have been prolonged and saved by the availability of ART in the country since 2005. The Tininga and Rebiamul clinics were pioneer HIV clinics which were implemented in 2005 and 2006 respectively in the WHP, and the Heduru clinic was established in the country’s capital city in 2004. The country’s 2008 UNGASS report reported that by

2007, 2250 patients were receiving ART treatment and the number of ART sites had increased from two in 2004 to 38 in December 2007 (22).



WHP: Western Highlands province, SHP: Southern Highland Province, EHP: Eastern Highlands Province

Figure 2.7 2008 HIV Registrations by province of origin at Tininga Clinic, Mt Hagen, Western Highlands Province.

Source: Tininga Clinic 2008 Annual report (37).

2.2 Decision Making

2.2.1 General decision making

Wikipedia defines decision making as an outcome of mental processes (processes of thought or cognitive processes) leading to selection of a course of action among several alternatives. Every decision process produces a final choice. The output can be an action or an opinion of the choice (38).

Decisions can be made in many ways, for example: by guessing, taking a poll, by following a hunch, by experience or by a systematic approach to determining the best way to solve a dilemma or achieve a better outcome. Decision making is a complex process and there are factors that must be taken into consideration while making decisions for a rational or irrational opinion choice or outcome. There are five basic ingredients (39).

Facts: Facts must be gathered by the decision maker for both the advantages and the disadvantages of the question in order to get a good understanding of the problem. There are times where there can be no facts available, thus the decision must be based on available data, which is sometimes called the general information.

Knowledge: Decisions can depend also on the decision maker's knowledge of circumstances surrounding the problem or a similar situation. This knowledge can be then used by the decision maker to select the appropriate or most favourable course of action or opinion of choice.

Experience: When a person has solved an issue before and the result was good or bad, the past experience can provide him or her data to best solve a similar problem later. Lack of experience can lead the decision maker to resort to other available sources of data from others who might have experienced similar problems or even to the point of experiments.

Analysis: Analysis of the problem is very important, and in scientific problem solving and decisions mathematics can be used. However in social situations it is a matter of analysing through the experience, knowledge and facts. However if none is available it is only a matter of intuition.

Judgement: Judgment is needed to combine the facts, knowledge, experience and analysis to come up with a proper course of action or opinion of choice.

A simplified meaning of fact and knowledge by Wikipedia: fact is a pragmatic truth, a statement that can, at least in theory, be checked and confirmed. Facts are often contrasted with opinions and beliefs, statements which are held to be true, but are not amenable to pragmatic confirmation. Knowledge is expertise, and skills acquired by a person through experience or education; the theoretical or practical understanding of a subject. People may base their decisions on strict facts and knowledge. However, there may be some situations where decisions can be based on beliefs or moral values in which case the decision's intuitive. (39)

2.2.2 Fertility Decision Making

Decisions about having a baby, how many, and when have to be made frequently by couples everywhere in the world.

Childbearing motivations, desires, and intentions: A Theoretical Framework

Miller D Warren in 1993 tried to conceptualize the phenomena of the motives of childbearing in the general population by summarizing all related studies in to 4 psychological step sequences. After extensive research and literature reviews of other studies, he outlined 4 main psychological steps, formation of traits, the activation of traits to desire, the translation of desires to intentions, and the implementation of intentions to form behavior (40).

TDIB framework: <i>Traits</i> → <i>Desires</i> → <i>Intentions</i> → <i>Behaviors</i>

1. The formation of traits.

Traits are defined as dispositions (prevailing tendencies) that people have to react in specific ways under different conditions. They can be very broad or narrow in nature.

The formation of traits is actually a long and complicated process in which life experience acts in conjunction with biological characteristics on an individual to form learnt traits or dispositions. These traits can be seen as psychological traits and may be stored as potential feelings, thoughts and actions that the person has acquired during the growth and developmental stage of his or her life.

Miller explained the biological factors that may have influenced traits formation by giving examples. Bonding and responsiveness to babies are regulated through the mother's body physiology, especially hormonal factors, or the mother's anatomy and chemistry of the central nervous system. As such they are subjected to individual variation, which results in individual differences in strength and variety of the childbearing motivation. As humans grow up, these biological factors are subjected to individual variations as a result of the diversity of life cycle experiences during childhood, adolescence and early adult life. These psycho-social encounters whether in feelings, thought, or event in life appear to shape and refine their childbearing motivations.

Traits can positively or negatively affect childbearing motivations, and can be general or very specific. Miller further divides them into 3 levels.

The broader level: Broad childbearing motivations represent an individual's overall disposition to have or to avoid having children. Because the innate, biological factors that affect bonding and responsiveness to babies appear to be based on broad psychological traits, it is probable that the biological factors discussed earlier make their greatest contribution at this broad motivational level.

The intermediate level: The intermediate-level motivations propel individuals toward or away from more specific aspects of childbearing, such as enjoying the experiences of pregnancy, childbirth, and infancy or worrying about the effect of having a child on parental stress. This level is more physiological and physical disposition in experiences.

The specific level: The values or attitudes held with respect to very specific aspects of childbearing, such as the desire to have a male child or the desire to provide a companion to a first child. It is at this level that biological factors probably make the least contribution and that learned expectancies (perceived likelihoods) about specific aspects of childbearing are most likely to influence (i.e. weight) the contribution that such specific attitudes make to the motive force towards childbearing.

2. Activation of traits to desire:

In this second step Miller proposed that psychological relevance traits combine to produce a desire for childbearing. Desires is defined as a psychological state that represents what someone wishes for or wants. There are principal groups of traits that activate desire

Motivational traits

Miller describes this group of traits as relevant dispositions to childbearing. Thus, for example, some may enjoying cuddling a baby or have a fear of childrearing or childbirth which formulates positive or negative desires.

A. Personality traits: these do not directly affects a person's disposition regarding childbearing but may play important roles in the formation of desires about childbearing and rearing. A person's personality may be important. For example; an affectionate, people oriented person may desire childbearing more than a self sufficient and orderly person, who has a well organized and independent life style. Personal values may be relevant. Thus, as gender role orientated person in a modern society may have a lessened childbearing desire than persons with a traditional gender

role orientation. This is because of the society's "familism" ideology. A system of internalized personal values can be seen as specific exposures to societal institutions that may influence childbearing desires.

- a. Family institutions: (origin)
- b. Religious institutions: Some religious faiths and beliefs may encourage more children than others.
- c. Educational institutions vs. Income level: people with higher levels of education tend to place a lower value on large families and tend to perceive more costs and fewer benefits in having children.
- d. Occupation institutions: people in higher status occupations, women in particular, tend to be more committed to their work and careers and more willing to forgo or postpone having children
- e. Other desires such as the timing of having a child, and numbers of children desired are also important.
- f. The person's psychological state: these are certain psychological states, namely the satisfactions or dissatisfactions that people feel about roles and role activities relevant to childbearing. Marital satisfaction is one obvious example. Dissatisfaction with one's marriage would likely decrease many individuals' childbearing and related desires, except in highly role-segregated unions, where just the opposite might occur. Women may compete with employment or their career in child bearing desires.

B. Life Cycle traits: The normal life cycle of a person has a significant role in formatting desires for whether to have a child or not. This includes the following:

- a. Age: The biological changes associated with aging might act to reduce the drive and energy that are required to bear and raise a child. This would imply a fairly constant rate of negative association between age and desires over time, with perhaps some acceleration in the late 30s and 40s.

b. Marital status: In marriage, it is seen as normal for a couple to have some children thus there is desire, whereas in a divorce their desire is lessened.

c. Family composition: this includes both parity (number of children) and gender of a child. The number of children a person wants or already has and the gender of any such child or children can certainly formulate desire for childbearing.

3. Desires to Intentions

Intention is the physiological state that represents what somebody plans to do. In Miller's third step, he proposed that transformation of desires to intentions must happen before action is to be taken, although there are some cases where there are impulsive actions. In these cases the intention was briefly formed. What makes impulsive actions different from intention, is that the desire behind the intention was raised relatively suddenly and forcefully. Miller proposed two main groups of factors that may constrain or shape a desire to become intentions.

a. The feeling and desires of significant others; the most influential person here would be the spouse. The spouse intention can also depend on the perception of each other about their own fertility desires and who is most influential. In addition to the spouse, the attitude and desires of other important people in the individual social network may also be influential. This may include the parents, parents' in-law and friends. These people may constrain and shape translation of childbearing desires into intentions

b. The situations that affect the practicality of what is desired: These are more likely to constrain desires from becoming intentions, for example:

- Unemployment
- Inadequate financial resources

These practicalities may affect the child-number intention and the timing of having a child.

4. Intentions to behaviors

After intention comes the behavior or the action. Behaviors fall into 2 main groups.

a. Contraceptive behavior: These are actions preventing conception or actions towards procreative behaviors.

b. Regulation action to pregnancy outcomes: This can be seen as contragestional behaviors to prevent a successful pregnancy outcome. An example would be abortion seeking behavior. A progestional behavior is seeking prenatal care and is orientated to achieving the birth.

Miller's theoretical framework suggested 4 sequential physiological steps which an individual encounters when considering childbearing and rearing. The 4 steps cover all aspects of issues and mental stages involved in performing an action or behavior. However, in this study only the first three stages, are considered and the fourth behavioral stage will not. This framework gives a clear understanding of the situations that are faced by human of general reproductive age.

Desires is defined as a psychological state that represents what someone wishes for or wants. Intentions are psychological states that represent what someone actually plans to do. They are based on *desires* but take into consideration what others desire and what can actually be achieved. An intention is actually desire constrained by reality (40). Though the meaning of the two words are quiet different, the research is not concerned with the psychological difference. For the purpose of this study, the two words, are not separated but combined together as fertility desires.

Desire and intentions are made based on personal, religious, social, traditional beliefs, and economic considerations. Personal motives for having a child may include the experience and fulfilment of parenthood and its joys. There are also some reasons against having a child, mainly being constraints in the form of the financial burden of bringing up a child, health concerns especially birth and genetic defects and problems, and fears about the child bearing process (41).

Data collected from eighteen developing countries (in Africa and Asia) comparing husbands and wives' attitudes toward fertility, showed that husbands tend to want more children sooner than their wives, although the family size differed between countries depending on behaviour (42). The male partner may play an important role in deciding the number of children the couple will have, the timing, and the type of contraceptives to be used. In some countries, the male partner has a greater influence than the female spouse. For instance in Ghana, the wife's attitude towards fertility desires and contraceptive use is mainly dependent on the husband's attitude and background character, for example, education (43).

The value placed on children in rural PNG, and high fertility rates has created a unique society. McDowell's study in rural PNG found that men often want more children than females because they see children not only as caring for them when they are old but also their supporters and a form of ally. To have a male child is to have a warrior and contribute to the manpower of the clan. He even concluded that despite the increasing population and pressures for land in rural PNG, unless the rural people of PNG feel secure they will only see the value of a child in terms of military strength; and will not want to limit their family size (44). This study illustrates that social integrity and security in PNG is more important than the economic or health risks involved in childbearing decisions. Fertility intentions and choices are influenced by a range of determinants that are mostly common but which can vary in magnitude from place to place.

2.2.3 Fertility decisions with HIV

Reproductive decision making is strongly influenced by cultural norms, such as the value of children in a particular society and the specific roles of men and women (43, 44). However these norms are not fixed, as they can be altered by influences of change in the society. One of the major changes to have occurred is the HIV/AIDS infection and epidemic around the world since the 1980s.

Any person who is infected with HIV may suffer these sequelae of many psychological conditions such as shock and confusion, great emotional stress,

depression, anxiety, anger and denial. However, the consequences of a diagnosis of HIV infection for a woman of childbearing age are particularly grim. She has the psychological stress of facing not only her own early death, but also the decision whether to forego the wonderful life experience of having a child; for the HIV seropositive woman, however, the decision about whether to have a child is likely to be fraught with anxiety. She must weigh the strong desire to bear a child against the knowledge that she may pass the virus to any child she may bear, and that she is unlikely to survive long enough to fulfil her role as a parent until her child reaches adulthood.

Because HIV infection is mainly transmitted by sexual intercourse, it poses an extreme challenge upon both serodiscordant (one couple HIV positive while the other not positive) and serocorcondant (couple both HIV positive) couples regarding their reproductive intentions and choices. The dilemma here is not only running the risks of infecting a seronegative partner (serodiscordant couple) but also the chances of infecting the unborn baby. Moreover serocorcondant couples having a child together will not only risk vertical transmission, but the additional possibility of developing drug resistant viral mutations (45). Historically, pregnancy was discouraged among HIV infected women as it was associated with a poor prognosis for the health of the mother and vertical transmission (3).

As the world reaches its third decade after the first infection was detected (24), there have been increasing advances and discoveries of newer and better drugs and preventative intervention, to prolong lives of infected persons and protect their babies from infection (5, 6, 7, 46). ART is said to reduce AIDS morbidity and mortality (5). The risk of vertical transmission has dropped from 25 % to 8% with the introduction of Zidovudine prophylaxis (4), and even elective caesarean section was associated with a 90% reduction of mother to child transmission risk compared to vaginal deliveries by HIV women who had undetectable HIV RNA (Ribonucleic acid) levels (46). Research now shows evidence that intervention can be used to help save the lives of babies born to HIV mothers. The most impressive advanced technologies of assisted reproductive techniques through artificial insemination and in vitro

fertilisation (IVF) in the most developed countries even suggest that the chance of horizontal transmission can be reduced to almost zero (31, 32).

This is exciting news for PLWHA, and can also be an influential factor for pregnancy decision making. With increased life expectancy from ART HIV individuals can come to view HIV as a chronic condition rather than an imminent death (13). Thus, WLHA and their partners will want to take the risk of having children, if the chances of vertical or sexual transmission are greatly reduced and compared less important than their personal, social, cultural and economical motives of having a child.

An explorative study conducted among African American HIV women by Sowell et al, in Georgia and South Carolina in the USA revealed six themes that influence the child bearing decision, spiritual and religious beliefs; knowledge and beliefs about HIV, previous experiences of child bearing attitudes of family and sexual partner; personal health and intrapersonal motives for having a child (47). Couples in Taiwan weighed the risks and benefits between vertical transmission, against their own physiological readiness, perceived support from family and friends and perceived support from the health care professionals to make a decision on having a child (48). This shows that a reproductive decision and the fertility desires of HIV women are very complex and though some factors that influence them are the same as a normal individual, there are other additional factors which should be taken into account, especially with the HIV infection and their related issues surrounding it.

Ko and Meucke concluded by outlining 4 steps that were taken by a couple with HIV (48).

1. When couples know their HIV status they will then have to decide between themselves whether to plan or continue to bear a child;
2. The second step is encountered with the medical system and they will be given some clues about how to make their reproductive decisions;

3. Step three, the couples then search for information themselves by either asking the health system or searching the media, peers and others to find as much information possible to help then formulate their reproductive intention;

4. The final step is when the couple weights the risks and benefits of childbearing.

These steps outlined by Ko and Meucke derived from their study of HIV couples in Taiwan, and can be applied to understand the reproductive decision making process by HIV couples in other places. This outline is quiet similar to every decision making which people make in general. As explained previously, generally the ingredients to decision making consists of the collection of the facts, knowledge, experiences, and then analysing and judgement (39).

To this day serodiscordant and serocorcondant couples face dilemmas as they battle the decisions of having a child.

2.3 HIV and factor associated with fertility desires

As explained previously, HIV infection alone is not the key factor in the fertility desires of women with HIV infection (49), even though it is a significant predictor of fertility intentions over time (50).

A systematic review in 2008 of 29 studies about factors influencing fertility desires and intention of people living with HIV around the world showed that some factors that influence this issue had no relationship with the decision makers' current HIV status (10). For example, in Southern Taiwan, HIV couples were influenced by the social Confucian teachings of traditional Chinese principles of ethics and morals, and filial piety and family obligation, when making fertility decisions (48). This shows how religion as a social institution can influence fertility intentions without HIV infection as a co- determinant. Even Aka-dago Akribi et al found that the sexual behaviour of WLWH depends on emotional and relational factors which are more important than health issues (11).

The systematic review outlined the main themes in all 29 papers and came up with factors that commonly influenced fertility childbearing desires and intentions of PLWHA as follows (10).

1. Factors positively influencing the desire and intention to have children.

- a. Age and gender
- b. Number of living children and having had previous children
- c. Prospective parenthood (motherhood and fatherhood)
- d. PMTCT and ART programs
- e. Subjective health
- f. Spousal, family, societal and cultural influences
- g. Stigma related issues (can be either positive or negative)
- h. Ethnicity

2. Factors militating against desires and intentions to have children:

- a. Health related conditions (vertical and partner transmission)
- b. Health workers attitude
- c. Community disapproval and stigma related concerns
- d. Experience with child mortality due to HIV
- e. Orphanhood

The review undoubtedly reflects differing personal, interpersonal socio-cultural influences, health related and gender influences on fertility desires of people of different races. The next paragraphs elaborate on some findings of interest to this current study. The socio demographic, health related, socio-cultural, psychosocial aspect in relation to the PNG context are elaborated below.

2.3.1 Socio-demographic factors

Age

Studies have shown that the age of WLHA has a significant relationship to her reproductive choices and outcome (10). Younger WLHA choose to become pregnant and desire a child more than the older women. This was true in the Brazil (12), Uganda (51), South Africa (19, 52), and the USA (13, 15, 53). Motherhood is not desired as age advances (49). Older women consider justifying their desire not to have another child when they have already had a child, especially before contracting the HIV infection. Younger women tend to have less or no, experiences of adult or motherhood life and thus this can affect this decision about having a childbearing experience. In a qualitative study by Siegel and Schrimshaw, WLHA in the USA explained they wanted children while they were still young and considered themselves healthy (20).

Number of children, gender preferences, history of HIV child death

WLHA have recognized and valued the powerful sense of life sustaining love from their children, and have expressed that children give them a reason to live despite their HIV infection (8). Studies show that the number of children is significantly associated with the desire to have children by HIV positive women (9, 15, 16). WLHA in Brazil who had at least a child were less likely to desire a child than those women who had no children (Adj OR = 0.26; 95% CI: 0.09-0.690) (11). In the USA, it was the same Adj OR 0.77 CI: 0.6, 0.9: $p < .05$ (12), and also in Uganda Adj OR = 0.82:95% CI 0.75 -0.90 (51). Though these studies were done in different countries with different cultures and different sample sizes, the underlying result still shows that the number of children was statistically associated with a desire for more children. WLHA who desire children are more likely to be married and living with a partner (13). In a qualitative study in Cote'd Ivire, result showed that WLHA who had had more than three children did not desire more children. Moreover, an exceptional number of women did desire children although they had had none. Children were seen

as a familial obligation and when they did not have any then there must be an explanation for their families and society (11).

This may be a general finding but may not be always be true for all WLHA, at individual levels, especially when one has already experience the pain of losing a child to HIV. Kanniapapan's et al, qualitative study in 2007 in India, illustrates this with the words of one of their respondent:

“One reason [for not wanting a child] is that we fear that this child may be HIV positive like the first one.” (25 years, no living children, does not want any) (54)

Although not statically significant, these show how some WLHA think and act upon their decisions after having experienced a previous outcome that was not good. Thus, they will have to make a critical sacrifice in their lives.

A child's gender can influence HIV couples reproductive desires and choice. In a Uganda study, HIV positive participants having no male child desired a child more than those with no female child (51). Ko and Muecke showed that male sex preference was one determinant in Taiwan, even though it was not a significant determinant in other western countries (48). Although there have been no studies of PLWHAs' decisions on childbearing in PNG, McDowell found out that PNG couples usually value children, especially boys, as they are seen as their future support, military allies and strength. With PNG's diverse culture, this is a common understanding, despite population growth and a land shortage, a PNG clan with many men is seen as a strong clan or community. This is very important for highlands communities where tribal fights are common (44).

2.3.2 Medical factors

Subjective health status and ART

Studies have shown that reproductive choices of HIV positive women are also dependent on the state of health (10, 13). Women who felt healthier were more

positive about having a child (13, 55). Some WLHA when their own health was poor expressed that they could not consider pregnancy, they were overwhelmed by thoughts of the child's disability, or that death and pregnancy itself can worsen their health (17, 49).

Desires to have children may be more positive with the accessibility of ART (55, 56). Adherence to ART and the duration improves health of WLHA and thus has an indirect influence on their desire for children. In 2 different studies, WLHA in Sub-Saharan Africa said that ART has restored their health and thus they were able to resume normal activities. This included their love and sexual life (57, 58). One of these studies was a prospective cohort in rural Uganda which followed up WLHA who had just started ART 2 years previously. At the beginning of the study less than 7% desired a child: however after 2 years, 16.9% of the women experienced a pregnancy. Sexual life was surely improved by the administration of ART as their health improved (58). Another, recent study in Uganda (2008) found that HIV positive women on ART were 2.99 times more likely to desire children than HIV positive women who were not on ART (57). There was a similar finding with South African PLWHAs in a study which found that being on ART and wanting children was associated more in females than in males, a significant gender difference finding (59)

HIV Reproductive Knowledge & Information and Service

Education for women is one of the key goals that will help fight HIV/AIDS and vertical transmission. Widening the access of education for women has become every developing country's major goal especially in countries where gender equality in education and health are lacking. Prevention of mother to child transmission programs may alter women's attitudes towards childbearing intention (56). Knowledge of vertical transmission in HIV women in 4 cities of the USA showed a significant influence on how they decided their reproductive choices (49). In a poor setting in South Africa, HIV women's knowledge on PMTCT had a greater association with desiring a child, (52) although not in Uganda (51).

Kirshenbaum et al found a very interesting result that showed WLHA who had had a child before diagnosis of their HIV infection did not want a child, and the reason was fear of vertical transmission. They were more concerned about the social, physical and mental harm that might be caused and claimed it would be because of their negligence. However those WLHA who desired a child were those ones with no children and were confident in the efficacy of the PMTCT program and knowledge (49). In in-depth interviews with HIV women in South Africa, most women expressed that after getting information on PMTCT they were encouraged to have a child in the near future; however, some still had fears of passing the infection to their unborn babies and were concerned about their own health and whether ART would help sustain them through the pregnancy time (56). The more HIV positive women are exposed to knowledge about PMTCT and reproductive choices the more they will make informed and logical decisions about their reproductive health. Knowledge about PMTCT, therefore, can influence women to not try child bearing, although a strong desire for children will see this group of WLHA taking the gamble. Sometimes women can overestimate the risk of vertical transmission because of insufficient information. Though there are different opinions, information can be a very powerful tool for change and decision making (39). Education empowers women to make better informed choices.

Media, booklets, health care givers, family members or peer group members can be the source of information. Women can make decisions about their reproductive choices alone or by consulting family, friends and peers. However, not all information is correctly delivered or interpreted. Kirshenbaum et al in their study pointed out misinterpretation and misinformation among HIV women, and suggested directions for more family planning education and counselling (49).

This leads to a questioning of the role of a health care giver with regard to the reproductive health and counselling of HIV positive individuals and couples. Many studies around the world have reported that PLWHA have expressed negative opinions about health care workers' attitudes towards discussing reproductive health issues (12, 47, 56). However, a 2008 study in Vietnam showed that health workers were

apparently more helpful and never really questioned HIV positive couples about their reproductive choices as most understood about the strong cultural implication of not having a child (60). In a recent study in 2009, in South Africa, HIV positive women expressed concerns that even though some health workers seemed open to discuss fertility issues, they tended to persuade infected mother not to become pregnant (55). Health workers must respect patients' rights and autonomy by providing them with information that will help them make the right reproductive decisions for themselves and their partners.

One study showed that HIV women tend to trust peer HIV positive friends about information shared between them. They went further by saying information from a peer HIV women was more practical and trustworthy than that of a health worker (61).

Half of the female population in PNG is illiterate and has a high fertility rate of 4.8 (62). This has been a concern as HIV infection is increasing in the female population of PNG more than the males and is spreading into rural areas (34). The highest infection rate has been observed in young women and is growing at a very fast rate. The peak age of infection in women is between the age of 20 and 24 years old (22). This is very dangerous as HIV infection in PNG spreads deeper into the rural areas where 85% of the population live, with lack of education and health services.

2.3.3 Psycho-social and cultural factors

Disclosure

The disclosure of HIV status to a spouse and a community may be the hardest thing to do. Disclosure of HIV status can influence a WLHA about her decision on reproduction. Ako-Dago Akribi et al in their qualitative study of WLHA who had experience of a PMTCT intervention program before, revealed some interesting scenarios. Scenario 1, a participant who desired and was planning a subsequent pregnancy had not revealed her status to her partner during the first pregnancy. She was planning to disclose her status after she became pregnant again

this time. In scenario 2, a participant whose partner had left her after their baby had died, still wanted to have another child but feared to disclose her status to a new partner in case she was rejected. In scenario 3, a participant, who had had 3 children already, would still agree to have another if her husband insisted. For this woman, she had not revealed her HIV status to her husband at the time she was interviewed (11). Pregnancy in these cases was seen as a means of entering “normal life” and reduced the risk of being rejected by families and partners. These three cases clearly show that disclosure of HIV has some impact on WLHA in Abidjan. In scenarios 1 and 2 they had not disclosed their HIV status to their intimate partners, to prove themselves healthy, normal and perhaps be accepted by their partners (case 3), thus their intentions to childbearing were positive.

The situation of disclosure of HIV status can be interpreted in two ways. To disclose HIV status to a community may mean WLHA have to live according to the community’s perception and belief about pregnancy and its outcomes when having HIV infection. On the other hand, when WLHA do not disclose their status to the community, they then have to live up to the standards of normal married women and the community’s expectations. Both sides of the coin of disclosure of HIV status have their own positive or negative impacts on WLHA, and on their desires and intentions to bear a child in relation to stigma. What she considers to be normal may be not normal in the eyes of the community. For example, because she is sick she may consider it normal and good for her not to have a child. However if she has not disclosed her HIV status to her partner or family, they may stigmatize her for not being able to conceive.

Spouse & Community expectations

To fit into a community, an individual has to live and abide by community laws, cultural norms, communal beliefs and expectations. Much has been said about discrimination and stigma of HIV positive individuals in a community within which they live. Spousal, societal and cultural expectations, and related stigma, can be

viewed from two perspectives, whether they have positive or negative influences on the choice of WLHA's reproductive desires and intentions (10).

In India, married HIV women stated that family support and acceptance was vital for desiring and deciding to have a child. Women who were victims of stigmatization by families were reluctant to have a child, as they feared the future of the children might be hard in terms of no family support. In contrast, those women who had positive views of childbearing had good family support with promises to look after their children if their health fails in the near future (54).

In South Africa, reproductive desires and choices may be more influenced by the partner and his community's expectations. The social value for getting married is to bear a child and this is the family's pride. If the women do not bear a child she may face the risk of being abandoned by her husband and criticised by her community. It is a disgrace in the eyes of the community not to have a child. WLHA tend to have much greater concerns about fulfilling expectations of specific others, like the parents in laws and a spouse, despite the negative impact of pregnancy and their health (55, 56).

These values expressed by WLHA in South Africa are very similar to PNG community beliefs and expectations of married women, especially in rural areas. In PNG society's culture mainly in the highlands regions, communities' put a high value on the bride price and children, and it is expected that newly married women must bear a child if the bride price was paid to her family by the groom and his family.

Bride Price in PNG

The traditional bride price system of PNG, a male dominated society, still dictates much of a married woman's life (63). Bride price is a form of payment in money and goods to the bride's family during a marriage ceremony, a practice mainly in the Highlands and some coastal areas of PNG. It is a big marriage festival, where money, pigs and food are given by the groom's party to the bride's relatives. Today,

the bride price is seen as a show of socio-economic status, the man who pays higher bride price is respected in the community. The bride is perceived by the groom and his relatives after payment as their sole property and must obey her husband and his immediate relatives (64). This can be obedience in the form of physical tasks, finance for the family, and her sexuality. Once the payment is made, the man has sole claim to the sexual and reproductive body of the wife (65). The man has influence over the woman about when to have intercourse with her and dominates her sexuality. If the woman refuses to have sex, this can lead to threats or even domestic violence in the family

Though it may not be fair and just, most women tend to accept this system as they are scared to start a domestic conflict or even violence, which is quiet popular in the Highlands of PNG (23,35). Even if the wife returns to her family after a conflict or problem, her own brothers or father will force her to go back to her husband because they have already received her bride price and she is the husband's responsibility and not theirs (66). The bride's family may not have any resources to repay the bride price to the groom and his relatives, or they may not want to start any tribal tension and will therefore not want to get involved after the bride price payment. The woman has no choice but to go back to the husband's village. Some women tend to comply with her husbands' demands and orders just so they do not lose their husbands in the practice of polygamy as they may be economically dependent on him.

Polygamy

Polygamy is a practice held strong in the Highlands of PNG. Highlands' men are known to marry more than one wife (63). Most men marry as a traditional way of being seen as "big men", that is being perceived by others as a man with value and riches who can take care of his wives. Polygamy is one of the main causes of divorce and domestic violence due to sexual jealousy (65). PNG has a high fertility rate and fertility is highly valued. Women in PNG who do not bear a child after marriage can be stigmatised by the local community as unclean, and men can also be

criticised by their peers has being unfit. These puts great pressure on the man and may lead him to abandon his wife or even get a second wife to bear children.

Some men in Ghana want more children because they have more than one wife, or want to have many wives because they want children (43). Women can also face very stressful situations, when deciding not to have a child when HIV positive and wanting to fit in the community norms of women social status and fulfilling community and husbands expectations, especially if a bride price payment was made to her family and relatives.

2.3.4 Motherhood, Religion and fertility

Motherhood and interpersonal procreation desire

Motherhood is considered a normal phase in the life of an adult female after she gets married. Every natural adult woman has instincts to be a mother. HIV as a sexual disease poses a dilemma for young HIV positive women who wish to follow their natural desire to experience motherhood. It has been shown that HIV positive women see child bearing as bringing hope and happiness. There is reason for living if you have a child because it is considered normal (56). The desire for motherhood is a common factor. Many HIV infected women report pregnancy and childbirth as a way to regain their sense of motherhood and sexuality, often making it a high personal priority (14). Crafts et al found that WLHA with procreative inclinations were more likely to intend and choose pregnancy which outweighed social support and personal health concerns (9).

Religion and fertility

Religious beliefs have been strongly associated with coping with HIV and its stresses and reproductive decision making in HIV positive women (48). WLHA are psychologically guilty of vertical transmission and thus it poses a challenge. WLHA sometimes turn to religion to ease that guilt and the psychological tensions of childbearing. In Siegel and Schirimshaw's study, WLHA offered their God their

turmoil and believed in His Powers and plans to keep their baby free from vertical transmission (20). Some WLHA continued their pregnancy because they believe that their unborn child was protected by higher powers (49). Sowell et al found that over half of the African American HIV positive women in his study believed that if they got pregnant it was God's will that they have the baby (61).

Nearly all Papua New Guineans are Christians, and with the HIV epidemic most Christian denominations have taken the lead to care and support those infected with HIV. Religious institutions can influence WLHA a lot.

In the researcher's experience as an HIV medical doctor for the HIV patients in the Western Highlands of PNG, the researcher has encountered patients who were influenced by their religious leaders and their faith to be healed by Jesus and thus stopped ART. After prayers by their religious leaders they claim they have been healed and wanted to recheck their HIV status. With these experiences, religion especially Christianity in PNG is having a great impact not only on providing the care and support, but very much engraving the Gospel of Jesus Christ and His healing powers to them. Living in faith can influence individuals to consider themselves healthy and normal, and thus this might affect the way they perceive continuing a family life and childbearing.

CHAPTER III

RESEARCH METHODOLOGY

3.1 Study design

In this study, a cross-sectional descriptive study was used to describe and identify vital factors that related to the fertility desires of women with HIV in the Highlands of PNG. The data was collected through face to face interviews and of a questionnaire with the patients' permission. A written request for assistance and permission from the relevant hospital and clinic authorities had been previously made.

3.2 Target population and study sites

The target population of study was be Highlands women of aged 18 to 45 who had been confirmed as HIV positive at the Tininga Clinic or Rebiamul clinics at least 3 months prior to the interview and who were currently living in the WHP. They had to have been attending one of the clinics for three months or more to ensure that they had settled in to the new clinic environment and had been treated and were stable for the interview.

Highlands women living with HIV: refers to the respondents originating from the 4 Highlands provinces of PNG. These include the WHP, Southern Highlands, Simbu and Enga Provinces; however they were currently living in the WHP.

PNG has 20 provinces which are divided into 4 regions, the Islands, Momase (Northern region), Southern and the Highlands region. This study was conducted in WHP but looked at women from 4 provinces provided that they were living in the WHP. Highlands zone share the same sexual and marriage cultures (64).

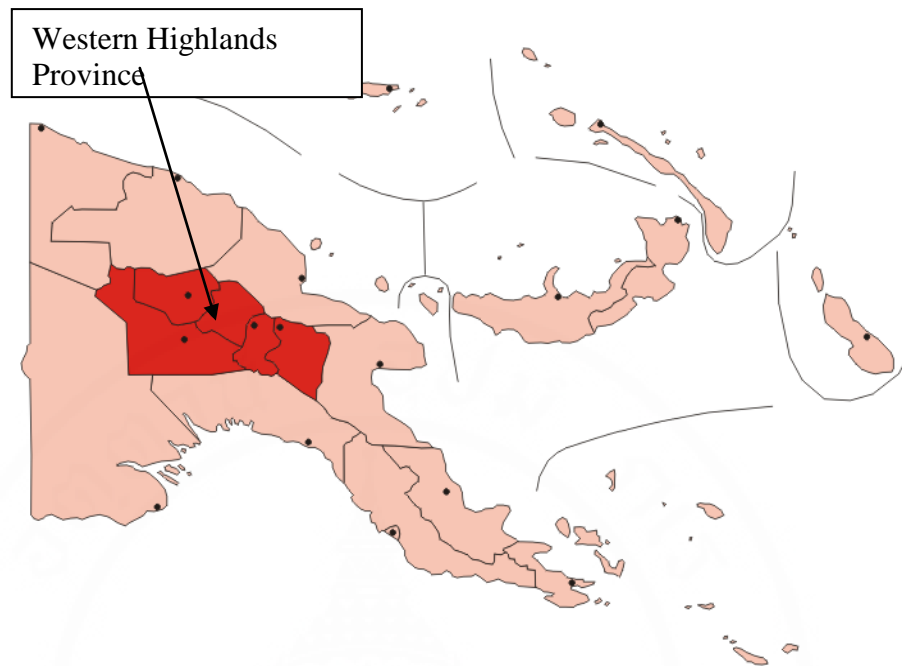


Figure 3.1 The Highlands Region of Papua New Guinea

Source: Google maps

Many national sex and reproductive knowledge and behavioural studies conducted by Jerkins and the Papua New Guinea Institute of Medical Research over a decade have tried to classify regional boundaries that reported beliefs and similar sexual cultures and practices. As shown in the map Figure 3.2, the Highlands region has been grouped as zone 10 which is called the Central West Southern Highlands (64). This supports the study here; though the study was carried out in the WHP it was women from the zone 10, who share a common sexual and marriage culture. Zone 11 is also part of the Highlands region but has a slightly different culture. Thus women from the Eastern Highland Province living in the WHP were not involved in this study.



1 = Islands, 2 =Massim, 3 =Manus, 4 = North Coast, 5 = Schrader-Ramu, 6 = Sepik River, 7 = Sepik Plains, 8 = Torricelli, 9 = Ok, 10 = Central West Southern Highlands, 11 = Eastern Highlands, 12 = Anga, 13 = Papuan Plateau, 14 = Papuan Coast

Figure 3.2 Culture Areas in Papua New Guinea

Source: NSRRT and Jenkins, 1994 (64)

Criteria for selection of study group

Inclusion criteria:

1. All reproductive age women from 18 - 45 years old
2. Confirmed HIV positive and were currently and had been attending the Tininga or Rebiatul clinics for 3 months or more.
3. Women belonging to the Highlands provinces of PNG were interviewed; this includes the WHP, Simbu, Southern Highland, and Enga Province.

Exclusion criteria

1. Having a stage 3 or 4 HIV clinical disease or staging or a history or current psychiatric condition. See Appendix 2 contains more detail about the WHO clinical criteria for HIV/AIDS disease progress staging.

2. Aged 15 to 17 years were excluded although in the reproductive age group because of the ethical concerns and difficulties it would cause in relation to parental permission and disclosure of the HIV status.

3. Women who had had a history of having tubal ligation or hysterectomy in the past.

4. Women who were single, meaning they were not married legally or formally (church or custom) and/or not living (cohabiting) with an intimate partner.

The study was conducted in two HIV clinics in the WHP of PNG. At the time of study, there were 3 HIV clinics which provided treatment, care and support for HIV clients in the WHP. This location because the WHP was the centre of the epidemic in the Highland region, and was also the second province to have the highest incidence of HIV cases recorded in 2007. It was also strategically located linking all other highlands provinces, and also the commercial centre of the 3 Highlands provinces, with settlers and a workforce from the other Highlands regions residing there.

The clinics were chosen, because they were the first two clinics to be set up and serve WLHA from all over the Highlands region. The implementation of ART clinics is still carried out in other Highlands region provincial hospitals. HIV clients come from all around the Highlands region and mainly settle in the WHP to use the services of HIV care, treatment and support. These Highlands women share the same sexual and marriage cultural practices (64). The Tininga clinic is one of the busiest public STI and HIV clinics in PNG. It is located in Mt Hagen, WHP of PNG. It is under the administration of the Mt Hagen General Hospital as a special clinic, and most of its logistics and medical supplies come through the National HIV response team in the National Level via Global fund. The Rebiamul ART clinic is an HIV

Clinic located just 1km outside Mt Hagen city. It is managed by the Catholic Health Service in PNG.

3.3 Sample size

The sample size was calculated using the following formula:

$$n = \frac{z_{\frac{\alpha}{2}}^2 p(1-p)}{d^2} = \frac{1.96*1.96* 0.5 (1- 0.5)}{0.06*0.06} = \mathbf{267}$$

Where:

n = the estimated sample size

Z = the z-score at 95% confidence interval level which is 1.96

d = degree of accuracy desired setting at 0.06

P = the proportion of population which possessed the characteristic of interest ie women with HIV in the reproductive age group. Since, there had been no similar studies carried out before in PNG, the p value was put at 0.5 to obtain the maximum sample size.

To allow for incomplete or missing data from the questionnaire, the sample size was increased by 10%, bringing the adjusted sample size to 294.

This was adjusted during the pre test. For this,30 HIV positive women who met the research criteria were interviewed in the Rebiamul HIV clinic and the proportion of their positive answers on the decision to have a child were used to calculate the sample size. The final sample size was not adjusted after the pre test as the portion of women who desired a child was 0.53 out of the 30 pretested.

3.4 Sampling Technique

The sampling technique was the purposive sampling. The Tininga Clinic and Rebiatul clinics were selected because they served as the largest public and church run HIV clinics in the WHP for HIV treatment and care. The location was strategic for getting reliable, ample and adequate information cultural and other reliable information regarding the target population in the study. All women who attended the clinic and agreed to participate in the study were interviewed at the time.

3.5 Research instrument

A structured questionnaire was developed and used for data collection. Most of the questions were closed-ended questions, with a few short open-ended questions. Questions were originally constructed in English and later translated into the common Pidgin language of PNG. The questionnaire comprised seven parts.

Part I: There were 15 questions related to socio-demographic and socio-economic background information of the respondents. This included the age, origin, education level, occupation, religion, income level, and marital status in relation also to polygamy and number of wives and living with primary partner and the duration. It also involved the number of children alive including the gender of the children and status of any children who had died due to HIV.

Part II This consisted of 7 questions related to the medical factors or health status of the respondents. This included questions on ART status, duration on ART, time since HIV diagnosis was made, HIV clinical staging, experience of PMTCT service and status of baby. This information was collected from the patient's clinic health charts and personal health book if possible. Disclosure of HIV status question (item) was asked in this part however categorised under the psychosocial factors.

Part III: These were groups of questions for each aspect of the respondents' perception of cultural values, beliefs and practice, these regarding opinion on male dominance and decision on reproductive outcome in a male dominating society in association with polygamy and domestic violence experiences. The items included perception on the issues on bride prize, community pressure and expectations of fertility and infertility after bride prize. There were 9 items measuring the perception of the respondents.

Part IV: There were 7 questions relating to psychosocial factors find out any experience of domestic violence in the form of physical, verbal or sexual assaults by the partner, bride price payment in marriage, sexual active status in last 3 month. Though the use of contraception item was asked in this part, it was a medical cue to action variable. It was asked here because it was a sensitive issue but consistent with other sensitive questions in this part, and could be asked at this stage without interrupting the flow of communication.

Part V: There were 4 items to measure the interpersonal and religious perception of the respondents..

Part VI: In this part, 9 items was asked about the respondents' cues to action to reproductive health services and its accessibility and efficacy, and PMTCT information and sources. Five items were asked to assess the knowledge of the respondents regarding mother to child transmission and prevention from mother to child transmission, and the use current of contraception.

Part VII:

Five questions were asked to find out about the respondents' fertility desires in the near future, their partners' desires regarding a child, their main concerns of not having a child, and the main reason for intending to have a child. They were also asked whether they would have wanted a child if they were HIV negative.

3.6 Pre-test

Before data collection, the questionnaire was pretested on a group of 30 women from aged from 18 to 45 years from Rebiamul HIV clinic in the Highlands of region of PNG. The pre-test was done once the questionnaire was translated into Tok Pidgin. The purpose of conducting the pre-test was to detect any unclear statement, or misleading or highly sensitive questions in the research instrument, and to verify the questions to ensure the validity and reliability of the questionnaire before it was used on the target respondents. The reliability of the questionnaire was measured using Kuder- Richardson Formula 20 (KR20) for the knowledge part and Cronbach Alpha for the perception part. In the Knowledge about PMTCT, KR20 was 0.50, while the Cronbach Alpha for cultural perception was 0.13 according to the pre-test of 30 respondents and 0.57 from the random sample of 30 selected from the whole data. It was clear that the cultural opinion of the respondents were very similar, majority had agreed to most of the items asked in the questionnaire before pre-test and after some adjustment were made to the items. Most women in this study came from poor settings and were very much culturally oriented. This could be the reason for the low result of Cronbach Alpha. The Cronbach Alpha for the interpersonal and religious items was 0.50. One other reason for the low KR20 and Cronbach Alpha in this study would be that the number of items used to measure the knowledge and perception too few. There were 5 items, 4 items, and 9 items for knowledge about PMTCT, interpersonal and religious and cultural perception respectively.

3.7 Data collection

The data of this study was collected by interviewing HIV positive women in the reproductive age of 18 to 45. The entire data collection included the following steps:

1. Identify and contact the study site to obtain permission to conduct the study. The research proposal was submitted to the Mahidol University Ethics Committee and also to the PNG National AIDS Council Secretariat Research Ethical

Committee, to request permission to conduct the proposed study. When the permission was granted, additional permission was sought from the Medical Director of the hospital responsible for the two HIV clinics.

Ethics permission was granted from Mahidol University Institutional Review Board on January 7th, 2010. COA. No. MU-IRB 2010/007.0701. Since the study was carried out in PNG, ethical clearance was also granted by the National AIDS Council Secretariat, Research Advisory Committee on the 20th of January 2010. Ref: RES 090023

2. Translation of the questionnaire to Tok Pidgin and the pre-test on a similar group of 30 women with HIV and between the ages of 18 and 45 were carried out in one of the other HIV clinics in the WHP. The researcher trained one research assistant about data collection methodology, explaining the purposes and process of the study, and the protection of the respondents' various legal and ethical rights.

3. Purposive sampling was used to select female respondents. The medical doctors' in charge of the clinics gave an introduction of the study, and introduced the HIV clients to the researcher, and explained the procedures before the respondents' informed contents were obtained. Before interviewing each participant the researcher or the assistant had to explain the purpose and the process of the study, as well ensure that the participants' information was kept confidential. The researcher also informed the respondents that some questions were going to be very personal and involved sexual histories and therefore, the respondents had the right to decline to answer or withdraw from participating in the study if they felt that they did not want to continue for any reason.

4. A written informed consent form was given to each participant to read and explained (if illiterate) before making any decision whether to participate in the study or not.

5. Those individuals agreeing to participate in the study were then asked to sign a formal written consent. For those who could not write, a print of their right

index thumb was placed on the form as a symbol that they had agreed to participate in the study.

6. The researcher and the assistant were then able to start the interview with the respondents. It took approximately 15-20 minutes to complete a questionnaire form. If the participants did not understand the meaning of a question, the researcher or the assistant explained the meaning of the question. If a participant felt uncomfortable about answering a question it was left blank.

7. The questionnaire consisted the following 7 parts:

Part I: Socio- demographic factors questions

Part II. Biomedical factors questions

Part III: Cultural perception questions

Part IV: Psychosocial factors questions

Part V: Interpersonal and religious perceptions items

Part VI: Medical cues to action factors questions

Part VII. Fertility desires questions, concerns and fears

8. The respondents were reassured that their responses would be confidential, and that no association could be made between any participant and the data contained in their respective completed questionnaire forms. The respondents confirmed that they wished to participate in the study and were assured that they had the right to withdraw from the study at any time.

9. After completion of each data collection, the researcher and assistant checked data for completeness.

3.8 Data management and analysis

The data were entered into Epidata; from there it was screened, cleaned, coded, and analysed by Minitab. After the data collection was finished, the data was recorded. Standardised procedures were used for recording and analysing. The data

was entered into Epidata and then it was processed and analyzed by Minitab software. The result was presented in two parts.

Part 1. Descriptive statistics, using frequency and percentage to present the distribution of the socio-demographic, medical, cues to action factors and to find out the concerns of fertility desires.

Part 2. Inferential statistics, Chi-square test, simple and multiple logic regression was used to describe the association of the fertility desire between socio-demographic characters, medical factors, knowledge about PMTCT and the perception of culture and interpersonal and religion, and psycho-social factors according to the conceptual frame work and based on the objective of the study. Using level of significance at 5% and had significant association if P-value is <0.05

Scoring and classification of the variables as follows:

Age was classified into three groups

18 - 25 years, 26 - 35 years and 36 – 45 years

Education Level was divided in to 3 levels. Low education was referred to respondents with no education or only primary education. Moderate education meant secondary school level. High education was referred to respondents who had gone to tertiary school or university level.

Average monthly income was divided into 3 parts: Low income with respondent having less than K100 per month, Moderate income was income above K100 to K500 and high income was over K500

Position in polygamous marriage was categorised into 2 parts a) 1st wife only, b) 1st wife & more, c) 2nd wife d) 3rd wife or more

Partner's number of wives: a) only me (referring to respondent as only wife), b) more than 1 wife

Number of children alive classified into three, 1) No children 2) 1 child, 3) 2 or more children

Number of male child: classified as a) nil b) 1 or more

Number of female child: classified as a) nil b) 1 or more

HIV Clinical stage was categorised in the four stages 1) stage 1 2) stage 2 3) stage 3 and 4) stage 4. This is based on the World Health Organisation (WHO) criteria for clinical and immunological of staging HIV disease in adults was used. For more detail outline of the classification of diseases, see Appendix B.

Time since HIV diagnosis: It was classified in to 3 categories: Less than 6 months, 6 month to 18 months and over 18 months.

Duration on ART: It was classified in to 3 categories: Less than 6 months, 6month to 18 months and over 18 months

Level of cultural perception based on the Percentile scale The respondent's perception on the cultural had 9 statements. The scoring criterion was divided into three levels: the numeric scores of 1, 2 and 3. The responds of agree, unsure and disagree, with scores of 3, 2 and 1 respectively for a positive perception statement. The Negative perception statement was given the reverse scores. The score is 27. According to the respondents score it was divided as:

a. High perception – respondents who got more than P_{75} in the total score in the perception statements.

b. Moderate perception – respondents who got P_{25} - P_{75} of the total score of perception statement.

c. Low perception - respondents who got less than P_{25} of the total score of the perception statements.

Level of interpersonal and religious perception was based on the median cut off score. The respondent's perception had 4 statements. The scoring criterion was divided into three levels: the numeric scores of 1, 2 and 3. The responds of agree, unsure and disagree, with scores of 3, 2 and 1 respectively for a positive perception statement. The Negative perception statement was given the reverse scores. The score is 12, Median score was 10. According to the respondents score it was divided as:

- a. Negative perception: respondents who got a score below 10
- b. Positive perception: respondents who got a score 10 and above.

Knowledge about PMTCT: In this study the knowledge of mother to child transmission and prevention was based on the Benjamin Bloom scale. This consists of 5 questions, with a total score of 5:

Correct answer = 1 score; Incorrect or unsure = 0 score

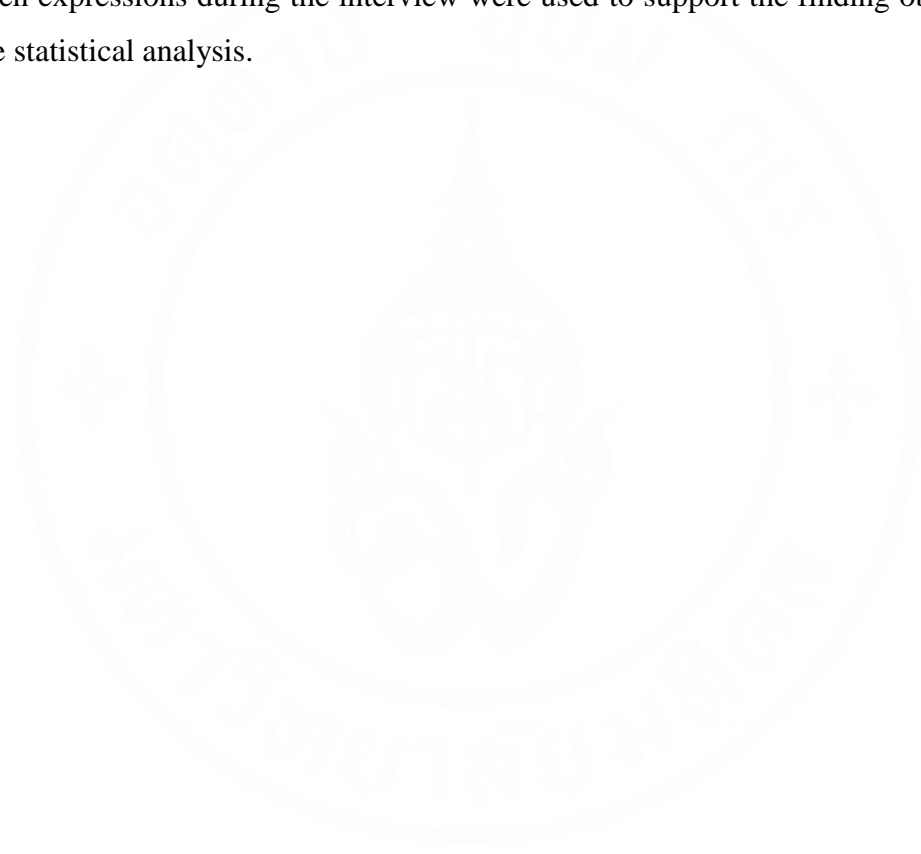
The total score was 5. In this study, the knowledge was divided in the three categories according to Bloom's criteria.

- a. Good – respondents that got more than 80% of the total score in the knowledge question. The cut off mark for this category was a score of above 4
- b. Moderate- respondents who got 60%-80% of the total score in the knowledge question. The cut off mark in this category was score between 3 and 4.
- c. Poor – respondents who got less than to 60% of the total score in the knowledge questions. The cut off mark for this category was a score of below 3.

Respondents' fertility desires: This is the dependent variable, fertility desires when analysing using logistic regression, the fertility desire responds, "no" and

“unsure” were combined as the group who desire not to have a child. It was coded “0” as it was the reference group. For the category of having a positive desire for a baby, it was coded 1 as it was an event of interest.

The information obtained from the open-ended questions and the patients’ open expressions during the interview were used to support the finding obtained from the statistical analysis.



CHAPTER IV

RESULTS

The aim of this research was to describe the relationship between fertility desires of HIV positive women in the WHP of PNG with their social demography, biomedical, cultural perceptions, psychosocial, interpersonal and religious perception, medical cues to action, and knowledge about PMTCT, concern for and against fertility desires.

The data was collected from 291 HIV positive women through one on one interview using a questionnaire in February 2010. Out of a total of 296 respondents interviewed, 291 met the inclusion criteria. Of the 5 omitted, 2 women were single, 2 had a history of tubal ligation and 1 was from the Eastern Highlands province.

The results are first presented in the form of descriptive findings using tables of frequency and percentage distribution of the independent variables. The latter were shown using simple and multiple logistic regressions. This shows the relationship between the independent factors and the desire for children.

These parts are as follows

- 4.1 Fertility desires and the independent variables
- 4.2 Association between fertility desires and independent variables
- 4.3 Predicting factors for fertility desires.

4.1 Fertility desires and the independent variables

4.1.1 Fertility desire

Out of the 291 patients in the study, 34.02 % had a current desire for a child. 59.45% desired not to have a child while the remaining 6.53% were unsure

Table 4.1 Number and percentage distribution of fertility desires of HIV positive women living in Western Highlands Province of PNG.

Fertility desire of respondents	Number n= 291	Percent %
Desire a child	99	34.02
Not desire a child	173	59.45
Unsure	19	6.53%

4.1.2 Socio demographic factors

Of the 291 patients, well over half (58.08 %) were between the aged 25 to 35 years old. The mean age of the patients was 29 years. The majority (68%) of them originated from the province of study. WHP while 14% were from Enga and Southern Highlands Province respectively. About 4% came from Simbu Province. Most patients were married (53.61%), while 29.90% were separated or divorced. 16.49% were widows.

Over three quarters of the patients had never gone to school or had never or completed primary education (38.83% and 39.18% respectively). 19.75% had completed secondary school and 2.75% had completed university or a tertiary collage. Regarding occupation, 68.95%, were subsistence farmers, earning their living by farming for self consumption. Only 12.71% were housewives, 11.34% were small businesswomen (these included street markets). Less than 10% of the participants had a qualified occupation in a government office (2.75%) or private company (5.50%). In terms of the patients average monthly income, about 70% had a low income of less

than K100 per month. 23.71% had a monthly income between K100 and K500, while 6.53% had an income of above K500.

Regarding religion, all patients practiced the Christian faith, thus the result was based on which common Christian denomination they followed. The majority (36.43%) followed the new Pentecostal denominations. About a quarter were Roman Catholics (25.77%), followed by the Lutherans and Seventh Day Adventists (14.78% and 14.43% respectively).

Regarding partner's number of wives, 64.60% were involved or once involved in a polygamous marriage with partners having more than one wife. According to their position in polygamous marriage, 34.03% were the only wife in the marriage, 30.93% were the 1st wife with other wives in line, 21.65% were 2nd wives while 13.40% were 3rd subsequent.

In terms of the number of children alive, well over one thirds (39.52%) of the respondents were childless, one quarter had only one child (25.77%) and the remaining had two or more children (34.71%).

With regard to the gender of the children, out of the 176 patients who had had a child, 72.16% at least had a male child. 65.91% at least had a female child. With regard to child death due to HIV, over three quarters (77.66%) of the patients answered no.

Over half of the patients were currently living with a partner, either cohabiting or officially married (57.04%). Of those patients who were living with their partners, over half (54.82%) had been doing so for 5 years or more, over a quarter (36.75%) had been with a partner for the last 1 to 5 years, while the remaining 8.43% had been with a partner for less than a year.

Table 4.2 Number and percentage of respondents by socio demographic characteristics

Socio-demographic characteristics	Number n = 291	Percent %
Age Group		
18 – 25 years old	78	26.80
26 – 35 years old	169	51.08
36 -45 years old	44	15.12
Mean = 29.61, SD = 5.43, Min = 18, Max = 45		
Origin (Province)		
Western Highlands	198	68.04
Southern Highlands	41	14.09
Enga	40	13.75
Simbu	12	4.12
Education		
No education	113	38.38
Primary	114	39.18
Secondary	56	19.75
University/Tertiary collage	8	2.75
Occupation		
Substance farmer	189	64.95
Labourer	8	2.75
Government employee	8	2.75
Private company employee	16	5.50
Small business	35	11.34
Housewife	37	12.71

Table 4.2 Number and percentage of respondents by socio demographic characteristics (cont.)

Socio-demographic characteristics	Number n = 291	Percent (%)
Average monthly income (PNGKina)		
Less than K100	203	69.76
K100 – K500	69	23.71
K500 and over	19	6.53
Mean = K191 SD = 319, Min = K10, Max = K3000		
Religion		
Roman Catholic	75	25.77
Lutheran	43	14.78
Baptist	8	2.75
Seventh Day Adventist church	42	14.43
Pentecostal churches	106	36.43
Other small denominations	17	5.84
Marital status		
Married/Cohabiting	156	53.16
Separated/divorced	87	29.90
Widowed	48	16.49
Partner's number of wives		
One	99	34.02
More than 1	188	64.60
Unknown	4	1.37
Position in polygamous marriage		
1 st & only wife	99	34.02
1 st wife with other down the line	90	30.93
2 nd wife	63	21.65
3 rd or more wife	39	13.40

Table 4.2 Number and percentage of respondents by socio demographic characteristics (cont.)

Socio-demographic characteristics	Number n = 291	Percent (%)
Number of children alive		
Nil children	115	39.52
1 child	75	25.77
2or more children	101	34.71
Number of male child		
	176 ^a	
Nil	49	27.84
One or more	127	72.16
Number of female child		
	226 ^{a#}	
Nil	60	34.09
One or more	166	65.91
History of child death due to HIV/AIDS		
Yes		
No	65	22.34
	226	77.66
Currently living with a partner		
Yes	166	57.04
No	125	42.96
Duration of time with current partner		
	166 ^b	
Less than 1 year	14	8.43
1 – 5 years	61	36.75
More than 5 years	91	54.82

^a n= total number of respondents who currently have biological son, ^{a#} = daughter

^b n= total number of respondents currently living with a partner.

4.1.3 Biomedical factors

Biomedical factors were medical factors related to the desire to have a child or not. These factors included HIV clinical stages 1 to 4, the time since HIV diagnosis, ART status, duration on ART and the experience of PMTCT. The following paragraphs and table describe the frequency and percentage of these factors and later in the chapter, the relationship between each factor will be elaborated by simple and multiple logistics.

The HIV clinical stage of the patients during their time of HIV diagnosis was as follows; over half of the patients (56.36%) were already experiencing stage 3 disease. Those who showed signs AIDS at stage 4 were 18.21 %, while 20.27 % were in stage 2 and the remaining were asymptomatic at stage 1.

With regard to the time of diagnosis to the current time of interview, over half of the patients had known their status for over 18 months (51.20%). A quarter of the patients (27.15%) knew their HIV status for 6 – 18 months and 21.65% had known their status for less than 6 – 3 months.

Well over three quarters of the patients (82.47%) were on ART, while 17.53 % were currently not. Of those 240 patients who were on ART, over half (51.67%) had been on ART for over 18 months, 30% for 6- 18 months and 18.33% for less than 6 months. 86.60 % of the patients had not had any experience of PMTCT intervention. .

Table 4.3 Number and percentage of respondents' biomedical factors

Biomedical factors	Number n = 291	Percent (%)
HIV Clinical Stage		
1	15	5.15
2	59	20.27
3	164	56.36
4	53	18.21
Time since HIV diagnosis		
< 6 months	63	21.65
6 -18 months	79	27.15
>18 months	149	51.20
ART status		
Yes	240	82.47
No	57	17.53
Duration on ART		
< 6 months	44	18.33
6 – 18 months	72	30.00
>18 months	127	51.67
PMTCT experience		
Yes	39	13.40
No	252	86.60

4.1.4 Cultural perception

The result of the cultural factors was based on 9 items that reflected the common cultural practice and cultural way of thinking of a typical Papua New Guinean Highlander. These items assessed the cultural perceptions of the respondents. Based on the score of 27, the mean score was 24.19, from a normal distribution, with a maximum score of 27 and minimum of 16. Using P_{25} and P_{75} as the cut off points, high cultural perception was given to participants who had a score of above 26 points,

moderate cultural perception was when the participant scored between 23 to 26 points, while low cultural perception was when participant scored less than 23 points.

Of these items, 16.84% had a low cultural perception, 68.38% had a moderate perception while 14.74% had a high cultural perception which related to the traditional values and culture of children, family and bride price with relation to HIV. Table 4 shows the frequency and percentage of the cultural perceptions of the respondents.

Table 4.4 Number and percentage distribution of respondents' cultural perception.

Cultural perception	Number n = 291	Percent (%)
Low	49	16.84
Moderate	199	68.38
High	43	14.78
Mean = 24.19, SD = 2.05, Min = 16, Max = 27		

4.1.5 Psychosocial factors

With regard to status of bride price payment in marriage, 54.98 % had bride price payments received by their families when they got married.

Over three quarters of the patients (76.29%) were verbally assaulted during their marriage by their partners, and over half of the respondents (53.61%) had experienced a form of domestic physical violence (assaults) with their partners in their marriage.

When asked about having experienced sexual assault (marital rape) in their marriages, well over half of the respondents (52.23%) answered yes. When adjusted to currently married women only, similarly 51.92 % had had sexual assault in marriage. Nearly half of the patients (42.27%) were sexually active in the last 3 months while 168 patients (57.73%) had not been sexually active in the last 3 months.

With regard to disclosure of HIV status, nearly all of the patients (96.56%) had told their status at least to someone apart from the health workers. Most patients (81.79%) had told their HIV status to their partners, nearly 70% had not disclosed their status to their public community or to the general public.



Table 4.5 Number and percentage of respondent's psychosocial factors

Psychosocial factors	Number n = 291	Percent (%)
Bride price payments in marriage		
Yes	131	45.02
No	160	54.98
Verbal assault		
Yes	222	76.29
No	69	23.71
Physical assaults/violence		
Yes	156	53.66
No	135	46.39
Sexual assault		
Yes	152	52.23
No	139	47.77
Sexual active in last 3 months		
Yes	123	42.27
No	168	57.73
Disclosure of HIV status		
a) No one (only healthcare givers)		
Yes	281	96.56
No	10	3.44
b) Partner		
Yes	238	81.79
No	53	18.21
c) Immediate respondent's family		
Yes	259	89
No	32	11

Table 4.5 Number and percentage of respondent's psychosocial factors (cont.)

Psychosocial factors	Number n =291	Percent (%)
d) Immediate partner's family		
Yes	185	63.57
No	106	36.43
e) Friends		
Yes	142	48.58
No	149	51.20
f) Public community		
Yes	89	30.58
No	202	69.47

Regarding partner's desire for a child, majority of the patients were not sure or had no idea of their partner's desire for a child. (59.45%). 27.15% patients' partner desired a child, while 13.40% said their partner's had no desire for a child.

Table 4.6 Number and percentage of respondent's partner's desire for a child

Partner's desire for a child according to respondent.	Number n = 291	Percent %
Yes	79	27.15
Unsure	173	59.45
No	39	13.40

4.1.6 Interpersonal and religious perception

In this category there were four items which were used to assess the interpersonal and religious perceptions of the respondents. The total possible score was 12. The perceptions were then divided into positive or negative perceptions depending on the median scores of 10. Respondents who scored 10 or less were categorised as having low perception, while those who scored above 10 had a high interpersonal and religious perception. Table 4.7 shows these results.

Table 4.7 Number and percentage of respondent's interpersonal and religious perceptions

Perception :	Numbers	Percent
	n = 291	%
Negative	109	37.46
Positive	182	62.54
Median = 10, QD = 1.22, Max = 12, Min = 4		

Over 60% of the patients had a positive interpersonal and religious perception.

4.1.7 Medical Cues to Action

With regard medical cues to action, knowledge about (PMTCT), of 5 items was asked and classified using the Benjamin Bloom's scale, into low, moderate and high level of knowledge. With the scores being normally distributed, the mean score was 3.60. This is shown in the table below.

Table 4.8 Number and percentage of respondent's knowledge about PMTCT

Knowledge about PMTCT	Numbers n = 291	Percent %
Low level	35	12.03
Moderate level	216	74.23
High level	40	13.73
Mean = 3.60, SD = 0.96, Max = 5, Min =0		

The majority of the respondents had moderate knowledge about PMTCT (74.23%) while 12.03% had a low level of knowledge about PMTCT.

With regard to whether they had heard any of the PMTCT information before, almost all (91.41%) had heard somebody talk, or had listened or read about PMTCT before.

In terms of the sources of PMTCT information, 62.89% had heard from health workers, while 37.11% never received any information about PMTCT from a health worker before. Only 7.56% had read some information from a PMTCT booklet or poster. When asked about having heard through a public media like radio or televisions only 4.12% responded yes. 37.11% said they had heard some PMTCT information and seen experience from peer HIV women.

Table 4.9 Number and percentage of PMTCT information and source

PMTCT information & source	Number	Percentage
	n = 291	(%)
Have you ever heard of PMTCT before		
Yes	266	91.41
No	25	8.59
Source of PMTCT information		
a) Health worker		
Yes	183	62.89
No	108	37.11
b) Books/ posters		
Yes	22	7.56
No	269	92.44
c) Radio/TV		
Yes	12	4.12
No	279	95.88
d) Peer HIV women		
Yes	108	37.11
No	183	62.89

In term of accessibility & efficacy of reproductive healthcare service, patients were asked if they had ever discussed any personal issues of their reproductive health intentions and concerns of fertility with healthcare personnel. Less than a quarter of the patients (20.27%) responded yes, while the rest (79.73%) had at sometime asked or discussed reproductive issues and intentions with a health worker. Regarding the opinion of the patients describing the role of a health care giver in providing reproductive health, PMTCT and family planning information in a clinic, 36.77% said the health workers did not talk about this at all and 36.08 % stated that health workers provided very little information. 19.59% said health workers were helpful, while 7.56% said health workers seem to ignore or discourage this topic. Table 4.10 shows the frequency and percentage of accessibility & efficacy of

reproductive healthcare service. With regard to the use of contraception nearly three quarters of the patients were not using any form of contraception, while only 29.21% patients were at least using some form of contraception.

Table 4.10 Number and percentage of accessibility & efficacy of reproductive healthcare service

Accessibility & efficacy of reproductive healthcare service	Number n= 291	Percent
Ever asked questions of reproductive intention, PMCTC or family planning to health worker		
Yes	59	20.27
No	232	79.73
Health worker's attitude and role towards reproductive intention, PMTCT and family planning services		
Do not talk about this at all	107	36.77
Provide very little information	105	36.08
They seem to ignore or discourage the topic	22	7.56
They are helpful	57	19.59
Current use of contraception		
Yes	85	29.21
No	206	70.79

4.1.8 Concerns or fears against fertility desire and reason for positive fertility desire

Table 4.11 Percentage and frequency of respondent's concerns and fears against fertility desire.

Concern or fears against fertility desires (can answer more than 1)	Number n =192 ^f	Percent (%)
Fear of infecting a new partner	59	30.73
Fear of my health deteriorating during and after child birth	48	25.00
My family is complete	46	23.96
Fear of infected child	44	22.91
Economic burden to rise family while sick	37	19.27
Partner was dead or left (I'm alone)	18	9.38
Stigma from the community	14	7.29

^fn= the number of respondents who were unsure or desired not to have a child. There was more than one reason given by some respondents.

Table 4.11 above shows the most common reasons given by the patients who desired not to have a child. Some patients had more than one reason. As demonstrated in the table above, the most common (30.73 %) was the fear of infecting a partner, especially a new partner. This was closely followed by the fear of self health if became pregnant (25%), their families was complete (23.96 %), fear of infecting a new child (22.91%), and economic burden (19.27 %).

Table 4.12 Frequency and percentage of most common reasons for positive fertility desire

Reasons for positive fertility desires (some respondents had more than 1 reasons)	Number n = 99^g	Percent %
I need a replacement in future	35	35.35
For protection, support and to look after me in old age	22	22.22
I have no child I want a child	20	20.20
I have only 1 child I want another	18	18.18
Partner wants a child	16	16.16
I want a boy	12	12.12
Strengthen marriage	8	8.08
Community pressure	6	6.06
Surplus land	5	5.05
Believes in ART/PMTCT to have an uninfected baby	4	4.04
Still young	4	4.04
Replacing baby who died	3	3.03

^gn = number of respondents who desired a child , there were sometimes more than one reasons given by a respondent

Of the respondents who desired of having a child, the most common reason expressed was because they wanted a replacement (35.35%). This was closely followed by the reason for protection and support in old ages (22.22%), having no child (20.20%) and having only one child and wanting another (18.18%). Partner desiring a child was also a common reason for desiring a child (16.16%).

4.1.9 Fertility desires if in the absences of HIV

With respect to the patients' fertility desires if in the absence of HIV, it was obvious that the majority of the patients would desire a child if they had not had HIV and were asked about their fertility desires now. Only 17.87% would not have wanted a child even if they were HIV negative.

Table 4.13 Percentage and frequency of respondent fertility desire if in the absences of HIV

If you were HIV negative would you desire a child	Desire a child n= 99	Do not desire a child n = 192	P-value
Yes	99 (100%)	140 (72.92%)	<0.001
No	0 (0%)	52 (27.08%)	

Majority of the respondent would desire a child if they did not have HIV. (82.13%), this was quite different in comparison to the current desire of a child at 34.02%. Using chi-square test, there is significant association between the current status of fertility desire and fertility desires if in the absence of HIV. Table 4.13 shows that 72.92% of the patients who did not desire a child changed their decision if they were HIV negative, while all patients who desired a child currently did not. This shows that HIV infection has significant association with fertility desire.

4.2 Association between fertility desires and independent variables

4.2.1 Association between socio-demographic characteristics and fertility desires

Table 4.14 shows the result of the simple logistic regression between the socio-demographic characteristics and fertility desires of the respondents.

There was no significant association between the education, occupation, religion, partner's number of wives, position in polygamous marriage, history of child death due to HIV, and the number of female child with fertility desires

The results showed an association between the age of the respondents and their fertility desires. The statistical significance was OR 5.72 (95% CI 2.03-16.08) and P value of 0.001 for the age group between 18- 25 years old, and OR 4.41 (CI 1.65 -11.77) P value 0.003 for age group 26 -35 years. Younger age group had highly significant association for a child than older age women. Fertility desires of HIV women dropped as age increased.

There was a significant association between HIV women who had high income and fertility desire with a P value of 0.022 (OR 3.06, 95% CI 1.71 -7.96), although the overall monthly income status was not a significant. The OR showed that patients with moderate to high monthly income had stronger desires for a child than there was to HIV women with low income.

With regard to the patient's marital status there was strong significant association marital status and positive desires for a child. Married women had more positive desires for a child than separated or divorced women (OR 0.53) or widowed women (OR 0.12) with an overall p value of <0.001.

The number of children alive was also significantly associated with their fertility desires for a child. Women who had no children or only one child alive were more likely to desire a child than those who had two children or more. With OR 4.23

(95% CI 2.26- 7.92) for women who had no child, and an OR 2.45 (95% CI 1.22 - 4.91) for women who only one child, with an overall P value of <0.001.

Living with a partner currently also had a significant association with fertility desires of the respondents. Those women not currently living with a partner were less likely to desire a child than those who were, with a P value of <0.001 (OR 0.27, 95% CI 0.15 – 0.46). See Table 4.14 below.

Duration of time living with a partner was also associated desires for a child. 166 respondents who had lived less than 5 years with their partner desired a child more than those who had lived with a partner for more than 5 years. Those who had lived from less than a year had OR of 1.38 (95% CI 0.44 -4.34) and those women who lived from 1 to 5 years had an OR of 3.05 (95% CI 1.55 -5.97. The overall P value was 0.004, with a stronger association between the respondent who lived 1 -5 years (p value 0.001).

There was nearly an association between fertility desires and the number of male child the respondent had. Those with no sons were more likely to desires a child than those who already had a son (OR 1.97, 95% CI 0.95 - 4.07).

Table 4.14 Associations between socio-demographic factors and fertility desire

Socio-demographic variables	Total n = 291	Desire a child (%)	Not desire a child (%)	Crude OR	95% CI	P value
Age group						0.001**
36-45	44	11.36	88.64	1		
26-35	169	36.09	63.91	4.41	1.65 -11.77	0.003**
18 -25	78	42.31	57.69	5.72	2.03 -16.08	0.001**
Education						0.449
Low	227	32.16	67.84	1		
Moderate	56	41.07	58.93	1.47	0.81 -2.68	0.209
High	8	37.50	62.50	1.27	0.29 – 5.44	0.751
Occupation						0.513
Sub/farmer	186	31.22	68.78	1		
Labourer	8	25.00	75.00	0.73	0.14 – 3.75	0.711
Government employee	8	25.00	75.00	0.73	0.14 – 3.75	0.711
Private company employer	16	42.75	56.25	1.71	0.61 – 4.82	0.307
Small business	33	36.36	63.64	1.26	0.58 – 2.73	0.559
Housewife	37	54.05	45.95	1.87	0.92 – 3.83	0.086
Income						0.065
Low	203	31.03	68.97	1		
Moderate	69	36.23	63.77	1.26	0.71 -2.24	0.426
High	19	57.89	42.11	3.06	1.17 – 7.96	0.022*

Table 4.14 Associations between socio-demographic factors and fertility desire (cont.)

Socio-demographic variables	Total n = 291	Desire a child (%)	Not desire a child (%)	Crude OR	95% CI	P- Value
Religion						0.879
Pentecostals	106	36.79	63.21	1		
R. Catholic	75	29.33	70.67	0.71	0.38 – 1.35	0.296
Lutheran	43	32.56	67.44	0.83	0.39 – 1.76	0.625
Baptists	8	25.00	75.00	0.57	0.11 – 2.98	0.507
SDA	42	38.10	61.90	1.06	0.51 – 2.21	0.882
Others	17	35.79	64.21	0.94	0.32 – 2.73	0.905
Marital status						<0.001***
Married/ cohabiting	156	43.59	56.41	1		
Sep/divorced	87	31.03	68.97	0.58	0.33 – 1.01	0.056**
Widowed	48	8.33	91.67	0.12	0.04 – 0.34	<0.001***
Number of partners wives						0.388
Only me	99	37.37	62.63	1		
Over 1 wife	192	32.29	67.71	0.80	0.48 -1.33	0.386
Position in polygamous marriage						0.125
Only me	99	38.38	61.62	1		
1 st wife & others	90	27.78	72.22	0.62	0.33 -1.14	0.124
2 nd	63	28.57	71.43	0.61	0.33 – 1.27	0.202
3 rd or more	39	46.15	53.85	1.38	0.65 – 2.91	0.403

Table 4.14 Associations between socio-demographic factors and fertility desire (cont.)

Socio-demographic variables	Total n = 291	Desire a child (%)	Not desire a child (%)	Crude OR	95% CI	P- Value
Number of children						<0.001***
2 or more	101	17.82	82.18	1		
1	75	34.67	65.33	2.45	1.22-4.91	0.012**
Nil	115	47.83	52.17	4.23	2.26-7.92	<0.001***
Number of male child	n = 176^a					0.071
Yes	127	21.26	78.74	1		
No	49	34.69	65.31	1.97	0.95 – 4.07	0.068
Number of female child	n = 226^{a#}					1.000
Yes	166	25.00	75.00	1		
No	60	25.00	75.00	1	0.49 – 2.05	1.000
Child death due to HIV						0.973
Yes	65	33.85	66.15	1		
No	226	34.07	65.92	0.99	0.55 – 1.77	0.973
Living with partner						<0.001***
Yes	166	45.78	54.22	1		
No	125	18.40	81.60	0.27	0.15 -0.46	<0.001***
Time with partner	n = 166^b					0.004**
>5 years	91	35.16	64.84	1.		
1 -5 years	61	62.30	37.70	3.05	1.55 -5.97	0.001**
< 1 year	14	42.86	57.14	1.38	0.44 -4.34	0.518

^a n= total number of respondents who currently have biological son, ^{a#} = daughter. ^b n= total number of respondents currently living with a partner. * P value <0.05, ** P value <0.01, *** P value <0.001

4.2.2 Association between biomedical factors and fertility desires

Table 4.15 below shows the association between the biomedical factors and fertility desires of HIV positive women living in WHP of PNG. With regard to the biomedical factors there was no significant association with any of the variables.

Table 4.15 Association between biomedical factors and fertility desire

Socio-demographic variables	Total n = 291	Desire a child (%)	Not desire a child (%)	Crude OR	95% CI	P- value
HIV Clinical stage						0.463
1	15	26.67	73.33	1		
2	59	38.98	61.02	1.76	0.05 – 6.18	0.380
3	164	35.37	64.63	1.50	0.46 – 4.94	0.500
4	53	26.42	73.58	0.99	0.27 – 3.61	0.984
Time since HIV diagnosis						0.294
< 6 months	63	34.92	65.08	1		
6 – 18 months	79	40.51	59.49	1.27	0.64 -2.52	0.496
>18 months	149	30.20	69.80	0.81	0.43 – 1.57	0.500
ART status						0.833
Yes	240	33.75	66.25	1		
No	51	35.29	64.71	1.07	0.57 – 12.02	0.833

Table 4.15 Association between biomedical factors and fertility desire (cont.)

Socio-demographic variables	Total n = 291	Desire a child (%)	Not desire a child (%)	Crude OR	95% CI	P- Value
Duration on ART	n = 240 ^h					0.571
< 6 months	44	36.36	63.66	1		
6 – 18 months	72	37.50	62.50	1.05	0.48 – 2.29	0.902
>18 months	124	30.50	69.35	0.77	0.38 -1.59	0.486
PMTCT experience						0.404
Yes	39	28.21	71.79	1		
No	252	34.92	65.08	1.37	0.65 – 2.87	0.411

^h= total number of respondent on ART

4.2.3. Association between cultural perception and fertility desires

There were nine items that measured the cultural perception of the respondents. The total score was 27, with positive items given a score of 3 for agree, 2 for unsure and 1 for disagree, while reverse scoring was applied to the negative perception items. The perception was then divided into low, moderate and high cultural perception using percentile. The mean was 24.19, a minimum score of 16 and maximum of 27. Low level of cultural perception ranged from 16 to 22, moderate was 23 to 26 and high was score of 27.

There was no significance with cultural perception levels of the respondents to their fertility desire to have a child. Table 4.16 below shows the total number of fertility desires value with their odd ratio, 95% CI and the P values. Although, cultural perception was not significantly associated with fertility desires, the odds ratio shows that women who have high cultural perception have a higher fertility desires for children than women with low cultural perception.

Table 4.16 Association between cultural perceptions and fertility desire

Cultural perception	Total n = 291	Desire a child (%)	Not desire a child (%)	Crude OR	95% CI	P value
Perception						0.713
Low	49	32.65	67.35	1		
Moderate	199	33.17	66.83	1.02	0.53 -1.99	0.946
High	43	39.53	60.47	1.35	0.57 -3.17	0.493

4.2.4 Associations between psychosocial factors and fertility desires

Psychosocial factors included bride price in marriage, domestic violence experience (physical, verbal and sexual), sexual activity in the last 3 months and the disclosure of HIV status to others and partner's desire for a child. Of those variables, partners' desire for a child, bride price in marriage, sexual activity and disclosure to partner had a significant association with fertility desires.

With regard to bride price payment in marriage, there was a significant association with a p value of 0.004. Those patients who had had a bride price payment made to them and their families were more likely to desire a child than those who had not had any form of payments during their marriage. (OR 2.03, 95% CI 1.24 – 3.32)

The result of chi-square test and simple logistic regression demonstrated that there was a significant association between fertility desire and the patients who had experienced physical assaults / violence by their partners, OR 1.64, 95% CI 1.01 – 2.68, P value of 0.045.

Patients who were not sexually active in the last three months had a lesser fertility desire than the patients who were sexual active in the last three months (OR 0.03, 95% CI 0.18 – 0.49, P value of <0.001)

Regarding disclosure of HIV status, patients who have not disclosed their status to their partner were less likely to have a desire for a child, than patients who had. (OR 0.51, P value 0.047)

Verbal and sexual assault in marriage, and disclosure of HIV status to families, friend or the public had no significant association with fertility desires of the HIV positive women patients.

Table 4.17 Association between psychosocial factors and fertility desires.

Psychosocial variables	Total n = 291	Desire a child (%)	Not desire a child (%)	Crude OR	95% CI	P value
Bride price Payment in marriage						0.004**
No	160	26.88	73.12	1		
Yes	131	42.75	57.25	2.03	1.24 -3.32	0.005**
Verbal assault						0.465
Yes	222	32.88	67.12	1		
No	69	37.68	62.32	1.23	0.70 -2.16	0.463
Physical violence/assault						0.045*
Yes	156	28.85	71.15	1		
No	135	40.00	60.00	1.64	1.01 – 2.68	0.046*
Sexual assault						0.571
Yes	152	35.53	64.47	1		
No	139	32.37	67.63	0.87	0.53 – 1.41	0.571
Sexually active in last 3 months						<0.001***
Yes	123	49.59	50.41	1		
No	168	22.62	77.38	0.30	0.18 -0.49	<0.001***

Table 4.17 Association between psychosocial factors and fertility desires (cont.)

Psychosocial variables	Total n = 291	Desire child (%)	Not desire Child %	Crude OR	95% CI	P value
Disclosure of HIV status						
a) No one (only health worker)						0.783
Yes	10	30.00	70.00	1		
No	281	34.16	65.84	0.83	0.21 – 3.27	0.785
b) Partner						0.047*
Yes	238	36.55	63.45	1		
No	53	22.64	77.36	0.51	0.25 -1.02	0.056
c) Immediate respondent's family						0.111
Yes	259	46.88	53.13	1		
No	32	32.02	67.57	1.84	0.88 – 3.86	0.108
d) Immediate partner's family						0.206
Yes	185	31.35	68.65	1		
No	106	38.68	61.32	1.38	0.84 – 2.28	0.205
e) Friends						0.118
Yes	142	29.58	70.42	1		
No	149	38.26	61.74	1.68	0.42 – 1.18	0.119
f) Public Community						0.153
Yes	89	28.02	71.91	1		
No	202	36.63	63.37	1.68	0.03 -21.16	0.158

* P value <0.05, ** P value <0.01, *** P value <0.001

The Table 4.18 below shows the association of partner's desire for a child with the fertility desire of the patient. The results show a significant association between the fertility desire of the partner and that of the patient. The patients whose partners did desire children were more likely to desire a child than those patients whose partners did not desire a child or unsure about their partner's desire. Chi-square test and simple logistic regression showed that those patients who know that their partner desires a child had a significant association with an OR of 17.25 and a p value of <0.001.

Table 4.18 Association between partners' desire for a child and fertility desire

Psychosocial factor	Number n = 291	Desire a child (%)	Not desire a child (%)	Crude OR	95% CI	P value
Partner's desire for a child						<0.001***
Not sure & no	212	17.45	82.55	1		
Yes	79	78.48	21.52	17.25	9.07-32.82	<0.001***

*** P value <0.001

4.2.5 Association between interpersonal, and religious perception and fertility desire.

With regard to interpersonal and religious perception there were 4 items which measured the respondents’ perception of her own belief in God to save their babies from HIV and the personal opinion of motherhood.

The total score was 12, being graded as agree for 3, unsure for 2 and 1 score for do not agree. All items were positive perception in general. The mean score was 10. Negative perception was categorised with of 10 or below, and a positive perception was when the score was above 10 points. The minimum score was 4 points and the maximum score was 12 points. There was significant association between positive interpersonal and religious perception with fertility desire. Those patients who had positive perception were more likely to desire a child than those who had a negative perception. (OR 1.99, 95% CI 1.17 – 3.37)

Table 4.19 Association between interpersonal, and religious perception and fertility desire

Interpersonal and religious perception	Number n = 291	Desire a child (%)	Not desire a child (%)	Crude OR	95% CI	P value
Perception						0.009**
Negative	109	24.77	75.23	1		
Positive	182	39.56	60.44	1.99	1.17- 3.37	0.011*

* P value <0.05, ** P value <0.01

4.2.6 Association between medical cues to action and fertility desires

Medical cues to action included knowledge about PMTCT, PMTCT information and source, accessibility and efficacy of reproductive health services and contraception use. The knowledge about PMTCT was derived from the same 5 items

used in studies in Brazil (13) and South Africa (53). There was a total score of 5, with the correct score for each item as 1 and incorrect or unsure was 0. The level of knowledge about PMTCT was divided into high with a score over 80%, moderate, less than 80 to 60% and low education level with a score of less than 60%. This was done using the Benjamin Blooms criteria. The median score was 4.

Of the medical cues to action variables only contraception use had a significant association with fertility desire. It seemed that patients who used contraception were more likely to desire a child (OR 3.94, 95% CI 2.31 – 6.67, P value < 0.001). Even when adjusted to only women living with partner only and using contraception, there was also association between this group of women and fertility desire. They result showed that even respondent living with their partner's currently and were on contraception were also more likely to desire a child then those living with a partner but not on contraception (OR 2.43, 95% CI 1.30 -4.55). Respondent sexually active and on contraceptive were also more likely to desire a child than those sexually active and not on contraception (OR 2.49; 95% CI. 1.20 -5.18)

Table 4.20 Association between medical cues to action; knowledge about PMTCT and fertility desire.

Medical cues to action variables	Number n = 291	Desire a child (%)	Not desire a child (%)	Crude OR	95% CI	P value
Knowledge about PMTCT						0.090
High	35	25.71	74.29	1.		
Moderate	216	37.50	62.50	2.07	0.41 -3.44	0.072
Low	40	22.50	77.50	1.73	0.94 – 4.56	0.745

Table 4.21 Association between medical cues to action; PMTCT information and source and fertility desire

Medical cues to action variables	Number n = 291	Desire a child (%)	Not desire a child (%)	Crude OR	95% CI	P value
PMTCT information & source						
Have you ever heard of PMTCT before						0.514
Yes	266	33.46	66.54	1		
No	25	40.00	60.00	1.33	0.57 -3.07	0.510
Source of PMTCT information						0.947
a) Health worker						
Yes	183	34.26	65.74	1		
No	108	33.88	66.12	1.02	0.62 – 1.68	0.947
b) Books/ posters						0.484
No	269	33.46	66.54	1		
Yes	22	40.91	59.09	1.38	0.57 -3.34	0.480
c) Radio/TV						0.490
Yes	279	34.41	65.59	1		
No	12	25.00	75.00	0.64	0.17 -2.40	0.504
d) Peer HIV women						0.849
Yes	108	34.43	65.57	1		
No	183	33.33	66.67	0.95	0.58 1.58	0.849

Table 4.22 Association between medical cues to action; accessibility and efficacy of reproductive health service and fertility desire

Medical cues to action variables: Accessibility & efficacy of reproductive health service	Num ber n=291	Desire a child (%)	Not desire a child (%)	Crude OR	95% CI	P-value
Ever asked questions of reproductive intention, PMCTC or family planning to health worker						0.371
Yes	59	38.98	61.02	1		
No	232	32.76	67.24	1.31	0.73 - 2.37	0.368
Health worker's attitude and role towards reproductive intention, PMTCT & family planning services						0.219
They are helpful	57	28.07	71.93	1		
Do not talk about this at all	107	37.38	62.62	1.53	0.76 -3.07	0.233
Provide very little information	105	30.48	69.52	1.12	0.55 -2.29	0.749
They seem to ignore or discourage the topic	22	50.00	50.00	2.56	0.93 -7.0	0.069

Table 4.23 Association between medical cues to action; current use of contraception

Medical cues to action variables	Number	Desire a child (%)	Not desire a child (%)	Crude OR	95% CI	P- value
Use of contraception	n=291					<0.001***
No	206	32.37	75.24	1		
Yes	85	56.47	43.53	3.94	2.31 -6.67	<0.001***
Living with partner using contraception	n = 166 ^d					0.005**
No	83	34.99	65.06	1		
Yes	83	56.63	43.37	2.43	1.30 -4.55	0.005**
Sexually active & using contraceptive	n = 123 ^e					0.015*
No	54	37.04	62.96	1		
Yes	69	59.42	40.58	2.49	1.20 -5.18	0.013*

^d n= number of respondents currently living with a partner

^e n= number of respondents sexually active in the last 3 months

4.3 Predicting factors for fertility desires

Chi-square test and simple logistic regression was conducted to investigate the relationship between each of the independent variables and the outcome (fertility desire). For further analysis to determine which independent variables had a significant association after adjusting the affects of other factors, multiple logistic regression was applied

4.3.1 Full model of multiple logistic regression

The all significant independent variables that had a relationship with fertility desires in the simple logistic regression were included in the full model, shown in table 4.22. Only marital status was not included in the multiple logistic regression analysis, as it was a confounder to living with partner. All the others were included. The following were found to be significant predictors of fertility desires: younger age, having no children, and having a partner who wanted a child.

Table 4.24 The full model of multiple logistic regression.

Independent variables	Adjusted OR	95 % CI		P –value
		lower	Upper	
Age group				
36 -45	1			
26-35	4.37	1.20	15.97	0.026*
18 -25	5.51	1.36	22.38	0.017*
Number of Children				
2 & more	1			
1	2.04	0.81	5.11	0.130
Nil	3.63	1.48	8.90	0.005**
Currently living with partner				
Yes	1			
No	0.76	0.27	2.13	0.601
Bride price payment				
No	1			
Yes	1.09	0.54	2.20	0.801
Physical violence/assault				
Yes	1			
No	1.71	0.89	3.30	0.107
Disclosure of HIV status to partner				
Yes	1			
No	1.37	0.55	3.42	0.494

Table 4.24 The full model of multiple logistic regression (cont.)

Independent variables	Adjusted OR	95 % CI		P-Value
		lower	Upper	
Sexually active in last 3 months				
Yes	1			
No	1.11	0.44	2.80	0.825
Partners' desire for a child				
Do not want a child or unsure	1			
Wants a child	13.04	5.68	29.91	<0.001***
Religious/motherhood perception score				
Negative	1			
Positive	1.90	0.94	3.83	0.074
Use of contraception				
Yes	1			
No	0.43	0.18	1.02	0.056

Goodness of fits test of the model: Pearson Chi-square test = 276.045, df 249, P-value <0.015

*P value <0.05, ** P value <0.01, *** P value <0.001

4.3.2 Final Model: Predictors for fertility desires

The final predictors for fertility desires found in this study were, younger age, having no children, having a partner who wanted a child. Having a partner who desired a child had the strongest association between the 3 predictors, followed by younger age and nil number of children.

Table 4.25 Final model of predictors of fertility desires

Independent variables	Adjusted OR	95 % CI	
		lower	Upper
Age groups			
36 -45	1		
26-35	5.03	1.50	16.87**
18-25	5.99	1.65	21.70**
Number of children			
2 & more	1		
1	1.65	0.70	3.91*
Nil	2.55	1.16	5.58*
Partner desire for a child			
No	1		
Yes	17.10	8.60	34.01***

* P value <0.05, ** P value <0.01, *** P value <0.001

CHAPTER V

DISCUSSION

This cross-sectional descriptive study was conducted in the WHP of PNG. 291 HIV positive women participated in the study which was carried out by one on one interviewing at Tininga and Rebiamul HIV Clinics in Mt Hagen. The data were collected from Feb 1 to March 1, 2010.

The study aimed to describe the relationship between fertility desires of HIV positive women in the WHP of PNG and their social demographics, biomedical, psychosocial, interpersonal and religious, and cultural perception and medical cues to action according to their knowledge on PMTCT and concerns for and against fertility desires. Moreover, the study also aimed at finding out factors that may predict fertility desires of HIV women living in WHP. In this study, the women respondents were confirmed sero-positive HIV patients of reproductive ages 18 to 45 years old.

5.1 Fertility desires

The study found that 34% of the respondents expressed desire for a child. Of those, most were married or currently cohabiting with a partner, had no children or only one child, and had declared their HIV status to their partners. Similar studies around the world have also investigated the proportion of HIV positive women who desire or intend to have a child despite their HIV status. A study in South Africa showed that 45% of HIV positive women were open to possibilities of having child (59). Stanwood's study of 118 HIV women receiving care in a university clinic in USA found that 35% wanted a child although it was not generalised to the general population of USA (67). Chen et al using national representative data of USA found 29% of HIV positive women desired a child (13). In Ontario, Canada (68) 69%

out of 490 HIV positive women who participated a study desired giving birth in future. 40% of HIV in Northern Brazil women desired a child (12), 25.8% of 280 in British Columbia, Canada (69), and 7% of 604 HIV positive women in Uganda, desired children (51). In the present study, 34% of HIV positive women in the Highlands of PNG desiring a child can be seen as quite high for a poor and less developing, country. In comparison with the developed countries' findings, Papua New Guinean HIV positive women in the Highlands desires for children are quite high compared to national representative data of, USA's study by Chan et al(13), British Columbia, Canada (69) and a developing post conflict country of Uganda (51). PNG is a small developing country, with very weak economy, low coverage of general health services and a high rate of HIV. This finding generates questions why there is higher fertility desires in this country, with no proper health advancing facilities. The likely factors are most probably related to its patrimonial society, gender inequities and tribal and domestic violence and this would be the possible explanation of having a high prevalence of fertility desire, like developed nations. The association between independent variables in the findings could explain these points more in the following paragraphs.

5.2 Socio-demographic factors

This study found that there was a significant association between age and fertility desires of HIV positive women. The younger patient's aged 18 to 25 and 26 to 35 years were more likely to desire for a child (Adj OR 5.99; 95%, Adj OR 5.03 respectively). Desire for a child decreased as age increased. Surprisingly, patients aged 26 to 35 in this study was a predictor of fertility desires as well. This showed that women in PNG, being 26 to 35 years of age, still had stronger fertility desires however not as strong as those women aged 18 to 25 years. The result was similar to other studies around the world, showing that younger age was a significant predictor to fertility desire in Brazil (12), Uganda (51), South Africa (52, 70), Canada (69), and the USA (13, 54, 67). PNG HIV epidemic is rising at an alarming rate, with a prevalence rate of 1.28% in 2006 projected to increase to 3.22% in 2010. The highest rate of infection occurs in women aged 15 to 29 years (34). This coincides with the beginning

and peak of reproductive lives, and hence it is critically important to establish reproductive service programme to assist this group of women both in preventing unwanted pregnancies or conceiving and giving birth as safely as possible.

This study failed to find any association between education level, religion or/ and occupation with their fertility desires. This was similar to the studies in Uganda (51), Ontario, Canada (68), and USA (13). It was obvious that the majority of the respondents in this study had very low education, (n= 227) and were mainly subsistence farmers (n =186).

The HIV epidemic in PNG has been spreading fast into the rural population (34). Most respondents in this study were illiterate and subsistence farmers, earning less than K50, on average per month if they were lucky. This study's finding showed that patients who earned a high monthly income of K500 or above were more likely to desire a child (OR 3.06; 95% CI 1.17 -7.96). In a country like PNG, with a weak economy, where the living cost is high, this can be a strong reason why HIV positive women with higher incomes desired a child more than poorer women. Those patients with higher incomes were most probably literate as well, thus, they would probably be able to get greater knowledge about PMTCT and the concerns and likelihood of having a child with HIV infection. Because of their high incomes, those HIV positive women perhaps have been able to afford milk supplements, as a way to prevent their child from contracting HIV through breast milk. This information they may have given or available at the HIV clinics. The findings in this regard were not consistent with the studies in South Africa (59), Northeast Brazil (12), USA (13), Canada (68) and Uganda (51)

Married women were more likely to desire children than separated, divorce or widowed women. Widows and women who were separated or divorced were less likely to desire children (OR 0.58; 95% CI 0.33-1.01 and OR 0.12; 95% 0.04-0.34 respectively). Marital status was not included in the multiple logistic analyses as it would be a cofounding factor to the variable currently living with a partner. A similar study in Uganda found similar findings with fertility desires and

marital status (51). However in USA, Chen et al found no significant association between marital status and fertility intentions Peltzer et al in South Africa, found no significant association with married HIV while comparing them with single women (52). Supporting these current study's findings, marriage and child bearing role of a woman in PNG is not taken lightly. Women who are married have an obligation to bear a child for their family especially their husband's family clan and it is quite a serious obligation as this makes women fit into the a patrimonial community like PNG (44).

Compared to those women who had no children, women who had two and more had a lower desire for children than those who had no children or only one. Being childless is a predictor of fertility desire, and this is a consistent finding also in Nigeria (9). Having no children was a predictor of fertility desire in this study. Being in a country like PNG especially in the rural areas, children are seen as valuable and an asset to the family and clan (44). Moreover, this study findings shows that the second most common reasons for desiring a child was for protection and support in old age or later in life (22.22%). Another important reason was PNG's strong culture of extended family relationships which is quite different from Western culture where a family is a nuclear unit. 20.20% of the reasons for desiring a child was because the women had no children and wanted a child, while 18.18 % of the reasons for a child was because the respondents had only one child and needed another for company, 1 child was seen as not enough. The number of children in itself is a reason for wanting a child. In PNG not having a child is seen has a disappointment and not a good public image for the family and couple. This study showed that 115 respondents had no children, and out of them, 48% desired to have a child (n=55). Or in other words, out of the 99 HIV women in this study who desired a child, over half of them had no children at the point of time. Of these 55 HIV positive women who desired a child and had no children, 36 (65%) of them were currently married. In PNG child bearing and nurturing largely defines women's social identity and status in the community (44). Other studies with findings that the number of children was associated with the desire for a child include Nobrega et al in Brazil (12), Myers et al in South Africa (70), Nakayiwa et al in Uganda (51), Chen et al in USA (13) .

Fertility desire for a child was nearly associated with not having a male child (OR 1.97; 95% CI 0.95 - 4.07, P value 0.068). There was no similar finding in other cross sectional studies, although it was reported in a qualitative study in Taiwan that HIV couples do show that the Confucian requirements of piety and son preference continued to influence their reproductive decision making (48). Similarly Vietnamese couples have expressed a preference for male children as there was a cultural tradition of parents and grandparents wanting a male offspring (60). In Uganda, for HIV positive men and women, the second most common reason to desire a child was to have a boy child (51). Although the religious background and culture may not be actually the same in PNG, PNG is known for its male dominance and male preference in a family, especially to have a son in the family, is seen as an heir in the patrimonial society. In PNG males inherit the father's land and resources. Customary land is seen as very valuable and a father would want to see his son at least produce a grandson to inherit that land.

Moreover, to have many sons is seen as an advantage in the family and clan because sons and brothers form strong allies and can look after themselves later (44). This is true especially in the Highlands of PNG where there are frequent tribal conflicts and ethnic clashes (71). There was no association between having no daughter currently and desiring a child. This can be explained by the male preference, and in rural PNG females are still today regarded as second class and inferior to men (35).

Though there was no association between fertility desires and the number of wives the partner had, or the position in polygamous relationship, it is clear that well over 60% of HIV positive women from the Highlands in this study experienced polygamous marriages. Quite interesting, there were a higher percentage of women (46.15%) who were third wives or more, desiring children. This may be because of the smaller number of participants in that group; however it can be also that this group of women are pressured especially to strengthen their marriage by having a child from the partner who already has other wives and children. As one respondent a 26 year old HIV infected 3rd wife explained her reason for desiring a child. "I feel upset that I

don't have a child and I want one because I am jealous when I see my husband give love and money to his other children from his other wives. Why can't he do this to me also?"

This study failed to find any association between fertility desire and having a history of having a child die due to HIV in the past. This was similar to the studies in Cape Town, South Africa (59), Uganda (51), and Northeast Brazil (12). No studies have found a significant association with history of child death due to HIV and fertility desire. This might mean that some women with experience of child death due to HIV may be scared to give birth again and possibly go through the same tragedy while at the same time some might still be desperate to have a child to replace the other that has died, thus giving an insignificant odds ratio.

Currently living with a partner was found to have significant association with fertility desire. Those women who were not currently living with a partner were less likely to desire a child than those who were living with a partner (OR 0.27, 95% CI 0.15 – 0.46). However it was not a predictor in multiple logistic regression. It can be likely that this finding reflects the effects of other confounding factors like age, marital status and the number of children.

Those patients who had lived between 1 to 5 years with their partner were more likely to desire a child than those who had lived less than a year or over 5 years. This would mean that being in a relationship over a year to five years was optimum time enough for couples to trust each other and to decide to want a baby together. A period of over 5 years may be that they have already had a child or children together and would not desire more if they know they have HIV. Myers study in South Africa supports this finding, showing more desire for a child when being in a relationship for less than 5 years (70). Stanwood et al also reported a similar finding with odds for a child when being in a relationship for less than 2 years (67). Though the periods with partner were slightly different in these 3 studies, it can be concluded that being in a relationship with a partner for less than 5 years significantly increases to fertility desires of HIV positive women.

5.3 Biomedical Factors

This study failed to indicate any significant association with fertility desires and the biomedical factors. It was clear that most of the patients in the study had stage 3 and 4 clinical disease upon their HIV diagnosis and majority had already been on treatment for over 18 months. This indicates that most respondents had known their HIV status when having stage three or four symptoms, thus most had AIDS. Clinical staging since diagnosis of HIV by World Health Organisation (WHO) Criteria had no significant association with fertility desires of HIV positive women in this study. Whether to desire or intend to have a child or not in this case was not influenced by the severity of HIV illness at time of diagnosis. The Uganda study found there was significant association with patients who had reached WHO criteria stage 3 and 4 (OR= 0.46, 95% CI 0.22 -0.95) with a decreased odds of fertility desire (57).

Fertility desires appeared to be independent of the time since HIV diagnosis which is consistent with Cooper and colleague's study in South Africa (59) and Southeast Brazil (12). However, this was not same for Stanwood and colleagues' study in New York, USA (67), and Loutfy et al study in Ontario, Canada (68). Their findings showed an association with the period since diagnosis of HIV in bivariate analysis but was not a predictor in the multivariable analyses. Compared to this study, it must be stated clearly here that the period of time is not measured using the same unit of time. However in this study, HIV service and ART programmes were introduced into the country less than 4 years ago, thus the period since HIV diagnosis may not be as long as compared to the other studies, since other countries have carried out HIV services for well over 5 to 10 years. Perhaps there may be a significant association if the service of HIV continues in the PNG for over 5 to 10 years than patients will be more inclined to view HIV as a chronic disease rather than an imminently life threatening illness.

Status of being on ART failed to produce any association with the fertility desires of HIV positive women in this study. The finding in this study was similar to Northeast Brazil's study (12). Stanwood et al study in USA had a different finding. Of

the 118 HIV positive women studied, women were more likely to desire a child when not being on ART (OR= 9.63: 95% CI 1.92 – 48.39) (67). In the studies of Cooper et al in South Africa (59) and in rural Uganda (57), assessing ART and fertility desire among HIV-positive women, found a totally opposite finding to the study in USA (67). It found a strong association for desiring a child when on ART. Although there was no association between this study and the status of ART, the other studies mentioned earlier, shows clearly that women on ART influences their fertility desire. This may be due to the composition of the study group which included few women not on ART, most of the women in this study were on ART when the study was conducted (n= 240). Women in Uganda (57) showed positive influence to fertility desire when on ART than women in USA (67). This difference perhaps is due to the different location and the quality of HIV service and information delivery in these two different settings. Women in a more developed country had a more likelihood of excess to better health conditions and information to ART, thus being more likely to make a justified reasoning why they desire children more when not on treatment, as they can consider issues of ART side effects, especially Efavirenz (67) during pregnancy. While in Uganda, (57) these HIV positive women were perhaps being in a rural setting, and being on ART may have improved their functional health status thus increasing their fertility desires as they have a normal healthy life on ART. With PNG a country with low income and increasing incidence of HIV, it would be wiser for clinicians dealing with HIV patients especially women to take into consideration the findings of ART status and fertility desires in Uganda (57) and provide a good informative counselling service to HIV positive women on the advantages and disadvantages of being on ART and the likelihood of having a child.

Duration on ART in this study failed to indicate association with fertility desire. This result was not similar to the Canadian study, their study showed that HIV positive women who intended a child in the future had an average of 3.9 years on ART, while women who intended not to have a child, had an average of 6.1 years on ART (p value <0.001) (68). On the other hand, in South Africa it was totally opposite; fertility desire was associated with increasing duration on ART among the female participant (OR3.52, 95% CI 1.44 – 8.60) (70).

With regard to prevention of mother to child experience, this study failed to show any association between PMTCT experience and fertility desire. This is most likely due to insufficient cases of women who had experienced PMTCT program since the study was conducted. There was only 37 respondents in this study who had had an experience of a PMTCT intervention program, thus there was no association found.

Although this was not a variable of interest, it was worth discussing that child HIV status after PMTCT program showed significance with fertility desire. Of the 37 patients who had experience PMTCT intervention programmes, 10 reported having a negative baby, while 17 had positive HIV babies. Of those patients there was a decrease in odds of fertility desire in the ones who had a negative baby than those who had positive HIV babies. This perhaps maybe be due to the satisfaction of having a negative baby, those women would prefer not desiring any more but concentrating on looking after their negative baby. This shows that there may be a likely chance that those women who have a positive baby, might opt for another child if their baby gets sick and die. Thus it would be wiser for clinicians to counsel these women more and give them the best option with regards to fertility desires and their reproductive health. (See Table 4.26 in appendix C)

5.4 Cultural Perception:

Whether HIV women had a high, low or moderate cultural perception on their culture related to child value, marriage, bride price and HIV in their communities it had no association with their desire for or against a child. Though there was no association, it was certain that the odds for desire were slight higher for women who had moderate to high cultural perception compared to those who had low perception. However individual reasons given by the respondents had some interesting findings, reasons for example, “I want a child to strengthen my marriage (8.08 %), I want a boy (12.12 %), I want a child because my family and community are putting pressure on me (6.06 %) and I want a child, because, me and my husband have surplus land (5.05 %).” When talking about strengthening their marriage, respondent’s meant that with a child, the husband or partner would be more settled in the family unit. Without a child,

the partner was most likely to abandon her and find a new wife or practice polygamy to have a child. This was one reason why women wanted a child. Another was the male gender, though nearly significantly associated with fertility desires, it was a reason which a handful of respondents stated for wanting a child, this was especially those patients who had no male child, and it shows the importance of having a male gender in a family, especially in the highlands where communities mainly prefer at least a male, to keep the clan and tribal allies. The community and family pressure for a child was mainly due to bride price payments that was already paid, thus the grooms family and community wants a child from the couple to be seen a tribal allies and pride. For example, quote, "My new partner is the only son and the family are putting pressure on us to have a child to keep the family generation" This is a 22 year old HIV positive woman, previously divorced from her 1st husband, now with a new partner who is HIV positive also and they have been going out for a year now. This is an example of desiring a child because of community pressure. The other cultural reasons for wanting a child was because the couple had surplus land in the village, there was no one to take over their land if they died. Quote, "Me and my husband want a child because my husband has surplus land and we need a child to take over this land if we die. We don't want someone else to take this land if we pass away." This shows how culture and land in PNG still plays an influence on the desire for a child, even if HIV-positive.

5.5 Psychosocial factors

There was significant association found with fertility desire and bride price in marriage in bivariate analysis. This study found that women, whose husbands had a paid bride price whether in the form of money or materials, were more likely to desire a child than those who had not (OR 2.03, 95% CI 1.24 -3.32). Bride price payment refers to the transfer of wealth from the groom's lineage to that of the brides and is continued to be practised widely in the Highlands and Papuan region of PNG. Traditionally it was practised based on the desire to bring families together in cooperative alliance for future marriage exchange, trade and other efforts (64). A woman in this society who has received bride price payment for her marriage may feel

more obliged to bear a child and contribute to the partner's clan and family. Women in the Highlands of PNG are defined and controlled through bride wealth (66). This is supported by the following reasons for wanting a child quoted by a respondent, "I want a child because my husband's community are saying I should have a child since they have paid bride price to my family already." This reason may explain the significant finding in this study. Though bride price payment was not significant in multiple logistic regression.

Verbal assault with partners had no significant association with fertility desire in this study; however this study found that there was significant association with HIV positive women who were experiencing domestic physical assaults /violence in their relationship with fertility desire. Those women who were not experiencing domestic physical violence/ assaults had a more likely chance of desiring a child than those who were experiencing domestic violence in their relationship (OR 1.64, 95% 1.01- 2.68), though it was not a predictor in the multiple logistic regression analysis. This group of women who desire a child was more likely in a stable happy relationship with their partners. However in this study, it must not be taken lightly that over 50% of group of women experiencing physical violence with their partners, do not desire a child, as studies have shown that, majority of PNG women report having been beaten by their boyfriends or husbands, because of sexual jealousy and refusal of sex on demand, were the most common reason given for violence in an established relationship (72, 73). Thus the patient's in this study who desire not to have a child perhaps were beaten up because they may have refuse sex from their partners, unfortunately this study, has not interrogated deep into what was the main reason for the physical violence experienced. One respondent in her reason for wanting a child stated that, quote "I want a child because my husband demands me, for us to have a child and he beats me up". This shows that the respondent actually wants a child because her husband is using physical violence on her for a child. Physical domestic violence should be taken seriously; there should be more interrogation and counselling and reproductive options available to HIV positive women who experience domestic violence (assault) in their relationship.

This study found that over 50% of the patients have had a history(s) of sexual assault in their relationship or marriages. Sexual assault in relationship was explained as being forced (without your verbal consent and also forced physically by pulling and beaten) and had sex when they did not want to. There was no association with this independent variable; however this study revealed a great number of patients who had a history of marital rape, this means they may end up having unwanted pregnancies and unwanted chances of HIV positive child thus adding another layer of problem for them. Of the 152 respondents who experienced sexual assaults in their relationship, only 45 were on contraception, meaning over 70% of those who experience marital rape in their relationship were not using any form of family planning. It should be taken into consideration that this group of women should be counselled, family planning and contraception should be easily made available to them.

Sexually active in the last 3 months was a variable that had a significant association with fertility desire. Women who were not sexually active in the last three months were less likely to desire a child than those who were sexually active (OR 0.30, 95% CI 0.18 – 0.49). Of the 123 patients who were sexually active, 50% desired a child which means that the other 50% who did not desire children were still sexually active. Of those 50% who were sexually active and did not desire a child, 56% were not on any contraception. This shows a very risky sexually behaviour among the HIV positive women, not only will they not protect themselves against unwanted pregnancy, but they can infect new partners or developing resistance HIV viruses in the processes of sexual intercourse. Being sexually active in the last 3 months was not a predictor of fertility desire in the multiple logistic regression analysis. A similar study carried out in rural Uganda found no significant association with being sexually active and fertility desires (57).

Disclosure of HIV status to the partner had an association with fertility desire, though it was not a predictor of fertility desire in the multiple logistic analyses. Those who had not revealed their HIV status to their partner were less likely to desire a child than those who have declared their HIV status to the partners (OR 0.51, 95%

CI 0.51 -1.02). This association was not so strong, as it would be due to the unequal distribution of the sample, as about 82% of our respondents have declared their status to their husbands or partners.

Partner's desire for a child was a strong predictor for fertility desire in this study. This study found that those women whose partner's desired a child were most likely to desire a child too (Adj OR 13.04, 95% CI 5.68 – 29.91). There were similar finding to this research in studies conducted in Northeast Brazil among 229 HIV positive women (OR 3.35, 95% CI 1.75 – 6.39) (12, 74). This finding may tell us that women with HIV in this study are more likely to follow the desire of their partners for having a child. In a male dominated society, despite the rapid social changes and westernisation influences, PNG still maintains its patriarchal traditions. This finding points out the gender base power in relationship. Women were more likely to obey or follow their husbands' wishes and demands; this finding supports the reality of the country's gender inequity and powers (35). It was also well supported in the short answers given by the respondents, the 5th most common reason to desire a child was because the partner wanted a child. (See Table 4.12)

5.6 Interpersonal and Religious Factors

In this category, four positive items were combined to measure the interpersonal and religious perception of the respondents. Given total score of 12, and using the median score of 10, two categories were created, negative and positive interpersonal and religious perceptions. The study found a significant association with desire for a child with those women who had a positive perception (OR 1.99, 95% CI 1.17 – 3.37). It was not significant in the multiple logistic regression. Though there was no other cross-sectional study that were conducted in this manner, qualitative studies done have pointed importantly that religious and interpersonal factor was an important in influencing positive decision making for a child. Siegel and his colleagues' in their generic study in 51 HIV women in New York in 2001, pointed out that one reason for having a child among these women were that they had faith in God who would protect the child from HIV, and they would feel complete, fulfilled and

cherished life dream of a women (20). Sowell and Misener in USA (Georgian & South Carolina) explored in their study the main themes for desiring a child included spiritual and religious beliefs and interpersonal motivation to have a baby (47). Sowell and Misener study was mainly with black African Americans who mainly followed the Christian faith (Baptist) which is similar to the religious background to the Papua New Guineans and the women in this study. Yet maternity is critical and bearing and nurturing children largely defines the women's social identity and status (44). This finding is very critical, especially in PNG where, well over 90% of the population are Christians. One of the items (faith in God can help save my baby from getting HIV), showed 60% agreeing to that statement. 74% of the respondents in this study agreed to the item, "If I get pregnant it will be God's will and a gift to me that I have this baby whether negative or positive". This shows how serious faith can influence fertility desires. This shows that religious leader and worker can be very influential people in community, thus they can help mothers with HIV make a more appropriate reproductive choice. On that note, one respondent's reason for desiring a child was, "it is God's plan, if he wants me to have a child I will, and I put my faith in Him (God)". This shows of women who desires a child and has placed her faith in God to give her a child.

5.7 Medical cue to action

The knowledge about PMTCT was not found to be significantly associated with fertility desires in this study. The questions were derived from similar studies in South Africa (52) and Northeast Brazil (13). KR20 reported in South African study was 0.57. This was similar to our study, with an Alpha conbrach of 0.5 this is most probably due to the illiterate proportion of our respondents in a poor setting similar to South Africa (52). In this study it was quite difficult to adjust the items any further to improve the KR20 to above 0.6, as 78% of the respondents had illiterate and had very poor understanding of the items. Though the level of knowledge about PMTCT had no association with fertility desires, the majority of the respondents in this study had moderate knowledge about PMTCT. Studies in South Africa (52) and Uganda (51) had a significant association. PMTCT intervention programme is in its second year in

the province where the study was conducted and has had a slow start (37), thus this can explain perhaps why there were no significances. These respondents may still have their own preference in fertility desires, for whether they trust the knowledge about PMTCT they have with PMTCT intervention programme that has recently being implemented in the Western Highlands province.

This study also found no association between ever heard about PMTCT intervention programme and fertility desires. 91% of the respondents have heard awareness of PMTCT intervention programme. This may be due to the less number of women who never heard of the programme thus we could not find any association in the analysis. Interestingly generic study in Vietnam, interviewing 56 women with HIV found that an influential factor was availability of PMTCT service (ART) encourages people living with HIV/AIDS to have children (60) and in India, Kanniapan et al in their generic study also found out the PMTCT programs and information was a positive influential factor for fertility desires (54).

There was also no association between the source of PMTCT information (health worker, books or posters, public media, peer HIV positive women) and fertility desire. However, it was clearly noted that most of the respondents heard PMTCT information from the health worker (n =108) and their peer HIV positive women (n =108). The source of information may not be important however the content of the information is very important, this study reminds us that it is very important to give accurate information as most HIV positive women tend to discuss PMTCT issues outside the clinic and this can be dangerous if the information has been misinterpreted or not correctly stated.

When asked about if the respondents have ever asked question or enquire about their fertility desire intentions, PMTCT, or family planning issues to the health worker majority answered no (n = 232). Though this was not significantly associated with fertility desire, over 30% of those who desire a child have not discussed these issues with a health worker. This shows the need for health worker to discuss this issues in the clinic on a routine basis, as this study points out that HIV women do not

tend to enquire about fertility and reproductive health issues to health personals and this can be very vital. Sowell and Misener in their study women in USA, Georgia and South Carolina pointed out that HIV- positive woman did not trust health workers to give them unbiased reproductive information (47). The reason behind this why HIV women in PNG do not enquire still needs to be investigated.

The attitudes and roles of health workers towards reproductive intention, PMTCT and family planning were not associated with fertility desire. Majority of the patients (n =212) thought that health workers did not talk about this at all, or they provided very little information. Only 57 patients out of the 291 said the health workers were helpful in discussing the related topics, while 22 patients said the health workers seem to ignore or discourage the topic. Though there was no significant association with any of these attitudes and fertility desires, this study clearly shows that even health workers in the clinic do not discuss these issues on reproductive health to their clients, some of these patients must still have unanswered questions which is not properly addressed with these kind of attitude by health workers towards these issue. Of the patients who answered that health workers seem to ignore or discourage the topic, half of them desired a child. Just as well, those 57 patients who said the health workers were helpful, 67% were the ones who were open to ask questions about their reproductive desires and issues (n=38). This shows a lack of reproductive health services in this setting, there has to be a routine reproductive consultation integrated into normal consultation given by a health worker or doctor asking more on sexual history, partner, family planning and contraception use.

The use of contraception was significantly associated with fertility desires. This study found that HIV positive women who were on contraception were more likely to desire a child than those not on contraception (OR 3.94, 95% CI 2.31 -6.72). It was not a predictor of fertility desire in the multiple logistic regression analysis.

Similar study done in Canada showed no association between contraceptive use and fertility desires (68). In the study, this association shows that this group of HIV positive women who do desire a child are more likely to use

contraception than those who do not desire a child. This finding can be a little misleading because majority of the women do not use contraception and this would mostly be the groups of respondents in the category of widows and divorced or separated thus, they would be less likely to desire a child. This might give significance to this variable. However in this study, when comparing only women living with a current partner, there was a similar significant association. Out of the 166 women living with a partner, 83 were using a form of contraception (that is 98% contraceptives usage was with women currently living with a partner), while the other half were not on any contraception. It was found women living with a partner and on a contraceptive was more likely to desire a child than those living with a partner and not using contraception (OR 2.43, 95% CI 1.30 - 4.55). See Table 4.21 for more information.

This study also analysed women who were sexually active in the last three months, with the use of FP and fertility desires. Out of the 123 respondent who were sexually active, half of them were using a form of contraception. This study found also an association that sexually active women on contraception were more likely to desire a child than those sexually active and not on any contraception (OR2.49, 95% CI 1.20 -5.18). (See table 4.21) All this analysis above point out that contraceptive use in this study is associated with the likelihood for a desire for a child. Though this may not sound logically correct, as most, may think of contraception as a barrier to prevent pregnancy thus would be more associated with mothers who desire not to have a child. So that means that those women in this study who were sexually active or were living with a partner and desired a child were mostly on contraception. Maybe this group of women who desired a child were more concerned when to actually have a child thus were more open in using contraception as a barrier while deciding when to have a child depending on other factors like their health, social or economical. Moreover, the finding may suggest indirectly HIV positive women living in Western Highlands who desire a child are more likely to seek family planning services than those who do not desire a child.

5.8 Reasons for and against fertility desires

The reasons given by women who desired a child or not in this study were quite extensive. With short answers to this part, some women had more than one reason for their positive or negative fertility desire, thus our percentage and frequency finding were arranged by the most common reasons and not according to the number of respondents. This reasons whether for or against fertility desires, ranged from medical and social concerns of women, who were at the same time, trying to manage their HIV infection, thus there was a complex array of reasons for desiring a child that included cultural value systems, personal traits, life-cycle factor and situational factor, this was elaborated previously in chapter 2, following Miller's fertility desire theoretical framework (40).

The most common reason for not desiring a child was fear to infect a new partner (30.73 %). This was followed closely by the reason's fear of self deterioration to health (25.%), my family is complete (23.96 %) fear of infecting a child (22.91%) and financial burdens of raising a child while sick (19.27%). It was interesting to see that fear of infecting a new partner was the most commonest reason for not wanting a child in the group of women who desired not to have a child. This can mean that most of the respondents in this group were not with a partner currently (or in this study, with a partner who had no HIV infection, only 2 cases) thus were having fear to infect a new partner. All medical concerns and fears seem to be the common reasons for not wanting a child (self health, partner's health and child's health). Stigma from community reasons was not so common, however worth mentioning (7.29%).

The most common reason to bear a child in this study was , I need a replacement in future (35.35%) followed by, for protection, support and to look after me in old age (22.22%), I have no child (20.20%), I have only one child (18.18%), my partner wants a child (16.16%), I want a boy, (12.12%) strengthen marriage (8.08%), family and community pressure (6.06%), surplus land (5.05%) and the others (See Table 4.12).

In Uganda, the most common reason for desiring a child was to leave a successor (52%), followed by not having any boy (14%), not having any children (12) and not having any girl (9%) (51). These reasons are very similar to the reasons given in this study. This may be explained by the some similar socio-cultural background Uganda and PNG shares, this includes a male dominance society, low women status, and polygamy.

Having a replacement in the future, was mainly referring to the respondents as, to leave something of their own selves, their “name” and lineage behind when they die. This reason again can show how important it is to have a child in a patrimonial society. Support and care in old age was also a common reason, this is a strong reason, Papua New Guinea though so diverse in culture, it holds a strong relationship with extended families lineage, and children are obliged to take care of their parents, especially in old age. Having no child or only one was also common reason. The number of children in itself is a reason for wanting a child. To have no children is seen as a disappointment in the family, especially in a country like Papua New Guinea where there is high fertility rate. McDowell, points out a very important reason way, we can say the number of children are a very important reason to have want a child, he conclude in his study, that though there was increasing population and land pressure in Papua New Guinea, this reasons will not make people, limit their family size, unless they also feel secured and no longer see military strength as a major value for children (44). This can also be true why there is also sex preferences for a male a reason for desiring a child, mainly for follower, supporter, warrior power and family alliance, especially in the highland where tribal conflicts are common (44,71). Polygamy still common in the highlands of PNG, and this can mean there is likely chances of a man marrying a 2nd or a third wife, this study found that one important reason for desiring a child was to strengthen their marriage. Women in the study when giving this reason, elaborated that to have a child with my partner, means he will not go out to find another women to have a child. It seems these women know that there is a likely chance that their husband can get involved in an extramarital affair or even get another wife, if they don’t bear a child. Thus to keep their relationship, these women can sacrifice their health and their unborn child’s health to have a child. The reasons

stated above point out clearly that culture and tradition do have a big influence on women's desire for a child.

When asked if they would consider a child if HIV negative of the 192 who desired not to have a child now, 73% stated that they would, with a median age of 29, while those who said no had a median age of 33 years old. This shows that HIV status was a great influence, not to desire have a child. Of the 52 respondent who said even if they were negative they would still not desire a child, were mainly those who had 2 or more children already (73%). Though, HIV status can influence desire for a child, it is important to note that those who did not want a child were the ones who already had enough and were older, it is most probably not due to the current HIV status, thus with the emerging ART excess and PMTCT intervention in the country, HIV positive women's desire for a child may perhaps shift, towards wanting more, especially where male dominancy, gender inequity and strong patrimonial lineage and child value is high.

5.9 Methodological study tool concerns:

Finally, there might be possibility that the sensitivity of this topic may manifest itself in participants giving certain response that may be socially acceptable. However, being the principal researcher and the interviewer and having a background of having been an HIV medical officer who has worked in the two clinics for over 2 years, the researcher strongly believes that there was a strong mutual trust and respect with most of the patients, who were interviewed. That trust had developed well over the 2 years as their medical doctor. The researcher also has had a lot of experience to discuss sensitive issues. Because of the trust, the researcher and patient have in sharing their experience before the studies in the clinics; the researcher had no hesitation as the prime interviewer.

One point in this study worth discussing here is the reliability and validity of the cultural and interpersonal and religious perception and the knowledge to PMTCT. 0.5 KR20 for knowledge about PMTCT and Conbrach Alpha of 0.5

interpersonal and religious perceptions and 0.57 for cultural perception is low. This is most like due to the low number of items used in the questionnaire to measure these variables. It is also noted in this study most respondents came from a poor setting and were culturally oriented. Moreover, all cultural perception items used in this study were author derived, and this may also affect the reliability and validity. Though there was pretesting done and adjustment made, there was not much change in the KR20 and conbrach alpha values. This is a lesson learnt in this study. It is vital to at least have a good number of cultural and perception items, especially in a study setting involving venerable persons in poor settings.

The sampling technique used in this study, was purposive sampling. Because of the nature of this study involving women living with HIV, this technique was the most appropriate way, and that was to recruit women who were HIV positive in the HIV clinic setting, which is the only best place to locate them. And only after they volunteer to participate in this study, then was the formal content and interview carried out.

To conclude this section on discussion, the study's strength would be that it is the first study that has looked into fertility desires and HIV positive women. It has found so relatively similar demographical factors related to studies around the world, moreover, findings related to social and culture of the country itself were unique and needs to be taken note of by health personals dealing directly with people living with HIV/AIDS and HIV health policies and planning makers. This study sets a baseline for more related studies into fertility, sexual behaviours and contraception use in HIV positive women and their spouses, in this cultural and socially diverse country of Papua New Guinea, thus with an ultimate goal of reducing incidence of new HIV infection and helping PLWHA live a happier and longer life.

CHAPTER VI

CONCLUSION AND RECOMMENDATIONS

6.1 Conclusion

This cross-sectional descriptive study was conducted in Mt Hagen, in the WHP of PNG among HIV positive women who were from the highlands region except from Eastern Highlands Province but residing in WHP. This study aimed at finding out the prevalence of fertility desires, and to determine and discuss factors that might influence these groups of women's fertility desires for or against having a child.

Data were collected during February, 2010. The study group comprised 291 HIV positive women. Respondents self volunteered and recruited after formal introductions made by the medical officer in charge of the clinics of the purpose of the study at clinic days. Those patients who volunteered to participate in the study were then informed in more detail orally and through written information sheets and participated in the one on one interview after consent was obtained from each participant in a private room. The questionnaire was in Papua New Guinea Pidgin with 56 questions and divided into 6 parts. These were socio-demographics, biomedical factors, cultural perception, psychosocial factors, interpersonal motherhood and religion perception, medical cues to action, fertility desires and its reasons.

After bivariate analyses, chi square test and simple logistic regression were used to assess association between each independent variable and outcome variable. The percentage and crude odd ratio was used to show strength of association with 95% confident interval. Multiple logistic regression was used to find significant predictors of fertility desires when controlling other factors. Only the variables that had a P-value

of 0.05 in the simple logistic regression analysis were used in the multiple logistic regression analysis.

6.1.1 Descriptive conclusion

This study found that 34% of the HIV positive women living in WHP of PNG desired or intended to have a child.

Socio-demographic factors: It is true that the epidemic is spreading in to the rural areas of PNG, as this study showed that most of the participants had a very low economical standard and were illiterate, who earn their living mainly domestic farming. Polygamous marriages seem to be common among these groups of women. Most of the respondents have no child.

Bio-medical factors: Majority of the women in the study were on ART over 18 months and had been diagnosis with AIDS. This shows that women present late to the clinic for an HIV test when they are really sick, they presented when they has signs and symptoms of being sick.

Cultural perception: Most seem to be more culturally orientated and influenced by the patrimonial society. This study found that the most factors that are associated to fertility desire among these groups of women seem to have justified reasons and explanation towards the country's strong gender based social and traditional customs.

Psychosocial factors: this study found that over to half of the HIV positive women in this study have experience of physical and sexual assault in their marriage respectively. Also in about 43% were sexually active, and of this half of them who were sexually active were not on any contraception.

Interpersonal and religious perception: there was a strong positive interpersonal and religious perception among most of the respondent. This also coincided with their Christian faith.

Medical cues to action: although there was moderately good knowledge about PMTCT among HIV positive women in WHP, their opinion towards health workers roles in reproductive health care was poor. Most have them have never enquired about reproductive issues or shared their concerns about their fertility desires in the clinic, further more they expressed great dissatisfaction in health workers role in addressing reproductive and family planning issues in the HIV clinics.

Reasons for and against fertility desires: Majority of the women expressed health related concerns and fears why they choose not to desire a child. Of the 99 respondent who desired a child, the decisions were related strongly by the influence of the cultural background and partner and community's perception or satisfaction.

6.1.2 Factors with significant associations & fertility desires

Simple logistic regression and chi-square test findings show significant association were, the age, high income, marital status, number of children, currently living with a partner, bride price payment, domestic violence physical, sexually active, partner's desire for a child, and current contraceptive use.

HIV women who were married and living with partner, aged 18-25 years, earning a higher income with no children had greater odds for desiring a child. This study also found that those women who have received bride payment in their marriages from their partner's family were more likely to desire children. Moreover, respondent who don't have experienced physical assaults from their partners were more likely to desire a child than those who have not. This study also found significant that respondent's fertility desire was strongly associated with being sexually active within the last 3 months and having a partner who desired a child. Respondent who were currently using contraception were more likely to desire a child than those who were not on any contraception.

By multiple logistic regression analysis, using all the significant variables in simple logistic except marital status as it was a confounder to living with a partner.

It was found that the younger age 18 -25 and 26-35 years respectively (Adj. OR 5.51, 95% CI 1.36 – 22.38 and Adj. OR 4.37: 95% CI 1.20- 15.97 respectively), having no children (Adj. OR 3.63, 95% CI 1.48 – 8.90), and having a partner who desires a child (OR 13.04, 95% CI 5.68 –29.91) were all significant predictors for HIV positive women to desire a child.

6.2 Recommendations:

Recommendations for HIV policy makers

The prevalence for desiring a child in this study was high compared to other developing countries. This suggests medical professionals need to be prepared to discuss and counsel women and their partners living with HIV/ AIDS about contraception and family planning. Finding shows that the general perception of the health worker role in reproductive health service is poor. Women in this study say that health worker don't talk about these issues in clinic consultations, yet half of those women are sexually active and desire not to have a child but are not on any contraception. Absence of reproductive discussion and access to contraceptive measures may lead to pregnancy occurring in the most unsafe condition and clients' desires to prevent or discontinue pregnancy may not be meet, thus may increase the likelihood of more paediatric HIV incidence. There is a great need to introduce medical personnel to be more open and alert to these issues and help these women make an informative and justified choice to suit their fertility desires. HIV clinics should integrate reproductive health services and contraceptives should be accessible to this group of women and their partners.

Recommendation for HIV healthcare professionals

Moreover, this study clearly points out that culture and gender based social issues are important factors that may have an influence on fertility desires of these group of women. This would recommend that health professionals dealing with these women regarding fertility and reproductive issues should at the back of their mind also remember the cultural and social factors that may be involved in an individual who comes to see them. Thus counselling should not always be based on medical

justification or concerns but must also consider the social, religious, cultural background and social history of the HIV positive women. HIV service in the clinic must be more in a holistic approach covering all aspects of the clients life and surroundings, this includes spiritual, social, mental and the physical being.

The study found that fertility desire was strongly associated with the partner's desire for a child, thus, it would be recommended that HIV clinics and reproductive services centre must also target the men. This means, it would be more advisable to encourage HIV-positive women to come to the clinics if possible with their partners, or vice versa for consultation, thus seeing it more like a one stop HIV family care centre. This will promote more exclusive family approach service than individual health. Holistic approach is being promoted and generated, understanding the patient more as a social being with a family and in a community and not as an individual. This approach gives the health provider a border understanding of patient's situation in society and therefore will be able to give the best service in a holistic manner to both partners.

Recommendation at community level:

As the study has shown, most factors related to fertility desires are complex and tied in strongly around the cultural issues and customs of the country. Spouse expectations, community pressure, domestic violence, sexual assault and bride price payments, all point out the influence of the male dominance character. There is still needs for more advocacies at the community level to address the needs of solving issues of male dominancy and empowerment of female gender in society. Women should be encouraged to be involved in more decision making in their families, these includes HIV positive women.

Recommendations for further research

There is urgent need for longitudinal and qualitative research into fertility desires and intentions of HIV positive women and men; this will give a better understanding health policy and planning maker, thus they can be in a better position

to evaluate and implement strategies to reduce unwanted pregnancies or improving planned pregnancies among PLWHA.

Later research into fertility desire should be carried out on HIV positive man and or a spouse of HIV positive women population, as it is essential to understand their desires, especially in this country, where male dominance is prominent and most reproductive decisions are influenced by the husband and his families.

This study sets a baseline for more related studies into fertility, sexual behaviours and contraception use in HIV positive women and their spouses, in this culture and socially diverse country of Papua New Guinea, thus with an ultimate goal of reducing incidence of new HIV infection and helping PLWHA live a happier and longer life.

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APPENDICES

APPENDIX A

QUESTIONNAIRES

FACTORS RELATED TO FERTILITY DESIRES OF HIV POSITIVE WOMEN LIVING IN THE WESTERN HIGHLANDS PROVINCE OF PAPUA NEW GUINEA

CLIENT INSTRUMENT

Instructions to interviewer are in italics.

All text that is meant to be read to the respondent is written in bold type. For example, when multiple choice options should be read aloud, the options are in bold, like the questions themselves. When options are intended for the interviewer only, i.e. when they should not read aloud, they are not in the bold type.

If the respondent declines to answer a question that does not have a specific option for the response, please write “decline to answer” in the margin of the questionnaire. Please do not read the option “decline to answer” aloud.

Respond to open questions should be recorded as close to verbatim as possible.

Interview Information:

Interviewer can complete this section before the interview starts.

1. Interview ID number in the form of 001,002,003...

2. Date of interview: ____/____/____
3. Interviewer name or code: _____
4. Location of interview: _____
5. Time of interview start: _____
6. Language of interview: _____

PART I: SOCIO-DEMOGRAPHIC FACTORS

1. How old are you? ----- years

2. What is your Province of origin?

1. Western Highlands

2. Southern Highlands

3. Simbu

4. Enga

5. Eastern Highlands province

3. What was your last level of school that you completed?

1. No education

2. Primary level

3. Secondary level

4. Tertiary or university level

5. decline to answer

4. What kind of work do you do?

1. Substance Farmer/gardener

2. Labourer

3. Government officer

4. Private Company officer

5. Own small business

6. Other (specify)

5. What is your income per month? _____

6. What is your religion?

- a) Catholic
- b) Lutheran
- c) Baptists
- d) SDA
- e) Pentecostal
- f) Others (specify)

7. What is your current marital status?

- 1. Currently married or co-inhabiting (*living together but not legally or official married.*)
- 2. Divorced/Separated
- 3. Widowed (live alone)
- 4. Declined to answer

8. How many wives does or did you husband have?

- 1. 1 (me only)
- 2. More than 1
- 3. decline to answer

9. What is the number of rank as a wife in the marriage?

- 1. First and only
- 2. First with another wife or wives down the line
- 3. 2nd
- 4. 3rd or more

10. Have any of your children died due to HIV infection?

- 1. Yes
- 2. No

11. How many live biological children do you have?

1. Nil (*skip to question 14*)
2. 1
3. 2- 3
4. 4 or more

12. How many living children are boys?

1. Nil
2. 1 or more

13. How many living children are girls?

1. Nil
2. 1 or more

14. Are you currently living with your husband or an intimate heterosexual partner?

1. No (*skip to 16*)
2. Yes

15. If yes for how long? Record the number of years or months that have passed and later divide into appropriate group below.

1. Less than 1 year
2. 1 to 5 years
3. Over 5 years

PART II: BIOMEDICAL FACTORS

In this section I would like to ask you some things about your health problems since your HIV diagnosis and whether you are taking the ART drug and PMTCT service and how you feel about it.

16. What was your highest reported HIV clinical staging since you diagnosis?

1. Stage 1
2. Stage 2
3. Stage 3
4. Stage 4
5. don't know

17. How long have you known your HIV status? Record the number of years or months that have passed and later divide into appropriate group below.

1. < 6 months
2. 6 – 18 months
3. >18 months

18. Are you taking antiretroviral therapy to manage your HIV?

1. Yes
2. No

19. How long ago did you first start taking antiretroviral therapy?record the number of years or months that have passed and later divide into appropriate group below.

1. Less than 6 month
2. 6 to 18 month
3. >18 months

20. Have you experienced the prevention to mother to child transmission program?

1. Yes
2. No

21. What was your baby's HIV status?

1. Positive
2. Negative
3. Not tested yet

22. Who have you shared your HIV status with? (can have more than one answer)

1. No to anyone excepts the health care worker.
2. Partner/ husband
3. Your immediate family members (s)
4. Your partner's immediate family member (s)
5. Your friends (*including trusted workmate ,church member*)
6. Public (*includes community or neighbours or public in awareness*)

PART III: CULTURE PERCEPTION

Now if you don't mind I would like to ask you some question about what you think about our strong highlands customs and practices of marriage and children.

(Answer with, agree, not sure, disagree,)

Cultural issues influences to wanting a child

	Statement	Agree	Not Sure	Disagree
23	Children are pride of the family and clan.			
24	Male child are mostly preferred over a female child in the community			
25	Children are burden to their families *			
26	Bride price payment during marriage does not put pressure on the women to bear a child *			
27	Bride price gives more power to men over their wife, especially sexual power.			
28	Husband beating wife is more common when bride price is paid.			
29	Bearing a child is important for the marriage since it strengthens the relationship and reduces risk of polygamy or being abandoned			
30	Not bearing a child can leads to stigmatization from community as being unclean or sick			
31	<i>Social- Cultural issues influence for not wanting a child</i> To have a HIV infection and become pregnant...is perceived by the community as a wrong thing to DO			

*negative question

PART IV: PSYCHOSOCIAL FACTORS

The next four questions I would ask are a bit sensitive and deals with personal matters and I emphasise that whatever you say would confidential if you would not want answer it is okay. I would like to ask if you have been involve in your partner or husband and your marriage (sexual)l life activities, domestic violence in your life since you had HIV. This would help has know behaviours of HIV partner and how to prevent the HIV transmission and help HIV women you need help. (Explain each definition of violence as question is being asked.)

32. Have your husband and his family paid bride price to your family for your marriage?

1. Yes
2. No
3. decline to answer

33. Have you experience physical abuse (using physical force like hit you with his arms, kicked you, slapped you, and gave you a black eye in the past by your partner since you have had HIV?

1. Yes
2. No
3. Decline to answer

34. Have you experience verbal abuse (said bad words or swear at you in a quarrel) from your partner or husband in the past since you have had HIV?

1. Yes
2. No
3. Decline to answer

35. Have you had sexual intercourse with your partner in the last three months?

1. Yes
2. No
3. Decline to answer

36. Have you been pressured or forced by your husband to having sex when you did not want to? (*sexual violence/ marital rape*)

1. Yes
2. No
3. Decline to answer

37. Are you and your partner currently using family planning?

1. Yes
2. No (skip to Q39)

38. If yes, what type of contraceptive are you currently on?

1. Condom
2. Pills
3. Injection
4. decline to answer

In the section I would like to ask you some question about what you feel about pregnancy and motherhood, and having faith in GOD. (You will answer as follows strongly agree, agree, don't know, disagree, and strongly disagree to for statements I make below).

PART V: MOTHERHOOD ROLES AND PROCREATION & RELIGION FACTORS

	Statement	Agree	Not Sure	Disagree
39	Motherhood and pregnancy is a beautiful experience and normal process of life			
40	Bearing a child brings hope and happiness and reason to live on earth			
41	Faith in God can help save baby from getting HIV infection			
42	If I get pregnant it is God's will and gift, that I have a baby whether negative or positive status.			

PART VI: CUES TO ACTION

Now I am going to read a list of statement about MTCT and PMTCT. Tell me if you agree with the statement or not or if you don't know. By saying yes if you think the statement is correct, no if the statement is not correct and I don't know if you do are not sure of the answer.

HIV knowledge on Vertical transmission and PMTCT (5 items)

	<i>Statement</i>	Yes	I don't know	No
43	Pregnant women who are HIV positive will always transmit HIV to their babies (N)			
44	Can an HIV mother infect her baby with HIV during pregnancy? (Y)			
45	Can a HIV mother infect her baby with HIV during delivery (childbirth)? (Y)			
46	Can an HIV positive mother infect her baby with HIV during breastfeeding? (Y)			
47	There are medicine to reduce the chance of mother to child infection of HIV (Y)			

The next question are question about your assess and your opinion about the service provided by the healthcare givers.

48. Have you heard about MTCT and PMTCT before? (Explain the terms)

1. Yes

2. No

49. Where did you hear information on vertical transmission and PMTCT?

1. Health worker

2. Books, poster, booklet, Brochures

3. Public media (TV, radio)
4. Peer HIV women (sharing experience and evidence)

50. Have you ever discussed issues of reproductive intentions and concerns and got advice by a health care professional at the clinic?

1. Yes
2. No

51. How you describe the role of a health care worker in providing you with reproductive information? -----

1. Do not talk about this at all
2. They provide very small information
3. They seem to ignore or have discourage the topic
4. They are helpful

PART VII: FERTILITY DESIRE

This is the last section of the survey and I would like to ask you about how you (partner) may feel about raising a child in the near future and the possibly fear and intention to do so.

52. Which of the following best describes your thinking about having a child in the near future?

1. I want a child in the near future (skip Q55)
2. I don't know or unsure (skip 54 % Q55)
3. I have decided that I do not want to have a child (Skip Q54)

53. Which of the following would best fit your partners thinking about having a child in the near future?

1. Yes would want a child in the near future
2. I don't know or unsure
3. He has decided that he does not want to have a child
4.

Reason for wanting a child

54. What would be your major reason for wanting a child? -

Concerns for not wanting a child

55. What are your main concerns for not in bearing a child?

1. Infecting child,
2. Burden of own illness during pregnancy and delivery,
3. Infect partner,
4. Financial and family burden,
5. No concern,
6. Stigma associated with illness,
7. Family already complete,
8. Others

56. If you were HIV negative would you have intended to have a child now?

1. Yes

2. No

End here and say thank you (bottom)

This concludes our interview with you. I would like to thank you very much for helping us. I appreciate the time that you have taken to answer the questions. I realized that some of these questions may have been difficult to answer, but it is only by hearing from women about their first hand experience and opinion that we can understand how to improve the services and lives of women and their partners living with HIV.

Time of interview end:

Additional interview notes:

QUESTIONNAIRE:
TOK PIDGIN TRANSLATION VERSION
FACTORS RELATED TO FERTILITY DESIRES OF HIV POSITIVE
WOMEN LIVING IN THE WESTERN HIGHLANDS PROVINCE OF PAPUA
NEW GUINEA

CLIENT INSTRUMENT

Instructions to interviewer are in italics.

All text that is meant to be read to the respondent is written in bold type. For example, when multiple choice options should be read aloud, the options are in bold, like the questions themselves. When options are intended for the interviewer only, i.e. when they should not read aloud, they are not in the bold type.

If the respondent declines to answer a question that does not have a specific option for the response, please write “decline to answer” in the margin of the questionnaire. Please do not read the option “decline to answer” aloud.

Respond to open questions should be recorded as close to verbatim as possible.

Interview Information:

Interviewer can complete this section before the interview starts.

1. Interview ID number in the form of 001,002,003...

2. Date of interview: ____/____/____
3. Interviewer name or code: _____
4. Location of interview: _____
5. Time of interview start: _____
6. Language of interview: _____

PART I: SOCIO-DEMOGRAPHIC FACTORS

1. Hamas krismas blong yu? ----- yia

2. Yu bilong wanem provins ol highlands?

1. Western Highlands
2. Southern Highlands
3. Simbu
4. Enga
5. Eastern Highlands province

3. Yu skul igo wanem level na yu pinis?

1. No education
2. Primary level
3. Secondary level
4. Tertiary or university level
5. decline to answer

4. Nau yu makim wanem ken work?

1. Substance Farmer/gardener (work garden lo kaikai)
2. Labourer (wok labour lo company or plantation)
3. Government officer (Govamen offisa)
4. Private Company officer
5. Own small business (gat liklik business)
6. Other (specify)

5. Yu save kisim hamas moni long wanpela mun taim yu wokim wok bilong yu? _____

6. Yu lotu lo wanem sios?

- a) Catholic
- b) Lutheran
- c) Baptists
- d) SDA
- e) Pentecostal
- f) Others (specify)

7. Nau yu marit o nogat?

- 1. **Currently married or co-inhabiting** (*living together but not legally or official married.*)
- 2. **Divorced/Separated**
- 3. **Widowed (live alone)**
- 4. **Declined to answer**

8. Hamas pela meri, man blong yu gat nau lo marit blong em?

- 1. 1 (mi yet)
- 2. mo lo onpla
- 3. decline to answer

9. Yu numba _____ wanem meri lo marit blong yu na man blong yu?

- 1. Mi 1st meri na nogat narapla behain
- 2. 1st meri na ol narapla I stap tu, behain
- 3. Numba 2
- 4. Numba 3 o mo

10. Yu bin gat pikinini husat i dai lo HIV/HIV or nogat?

- 1. Yes
- 2. No

11. Hamas pikinini (yu yet karim) yu gat now?

1. Nil (*skip to question 14*)
2. 1
3. 2- 3
4. 4 or more

12. Hamas pikinini blong yu, em pikinini man?

1. Nil
2. 1 or mor

13. Hamas pikinini bilong yu em piknini meri?

1. Nil
2. 1 or mor

14. Nau yu stap wantaim man blong yu or nogat?

1. No (*skip to 16*)
2. Yes

15. Yutuple stap hamas mon or krismas nau? Record the number of years or months that have passed and later divide into appropriate group below.

1. < wanpla yia
2. 1 to 5 yia
3. Ova 5 yia

PART II: BIOMEDICAL FACTORS

Nau mi like askim yu sampla samting long sick blong yu, HIV marasin na servris yu kisim lo klinik.

16. Wanem HIV stag blong yu taim yu bin sik na kam lo haus sik?

1. Stage 1
2. Stage 2
3. Stage 3
4. Stage 4

17. Hamas mon or krismas nau yu save lo HIV sik blong yu? Record the number of years or months that have passed and later divide into appropriate group below.

1. < 6 mun
2. 6 – 18 mun
3. >18 mun

18. Nau yu kisim marasin blong banisim binatang blong HIV yet or nogat?

1. Yes
2. No (skip to Q 20)

19. Hamas mon or krismas nau yu stap long marasin blong banisim binatang blong HIV?.....record the number of years or months that have passed and later divide into appropriate group below.

1. < 6 mun
2. 6 -18 mun
3. >18 mun

20. Yu bin kisim sampela helpim (PMTCT program) lo banisim HIV binatang lo nupla(baby) pikinini blong yu o nogat?

1. Yes
2. No (skip to Q22)

21. Baby pikinini bilong yu igat HIV o nogat?

1. Positive (igat HIV)
2. Negative(I nogat HIV)
3. Ol I no testim HIV yet

22. Yu tokaut ol HIV sik blong yu long ol lain family na wantok tu or nogat?

(can have more than one answer)

1. **Mi no tokaut yet.. ol health wok manmeri tasol save**
2. **Mi tokaut long Man bilong mi**
3. **Mi tokaut long Blut family bilong mi**
4. **Mi tokaut long Blut family bilong man**
5. **Mi tokaut long Your friends** *(including trusted workmate ,church member)*
6. **Mi tokaut long public** *(includes community or neighbours or public in awareness)*

PART III: CULTURE PERCEPTION

Nau saposе yu orait bai mi askim yu sampla kwesten long cuture blong yumi Highlands long marit na long family na pikinini. Yu bakim lo displa toktok olsem yu wanbel, yu no save or yu no wanbel long ol displa toktok me bai tokim yu.

(Answer with, agree, not sure, disagree,)

Cultural issues influences to wanting a child

	Statement	Agree	Not Sure	Disagree
23	Ol pikinini em bikpela samting long family na clan.			
24	Ol man pikinini, em ol mo gutpla long ol meri , community save laikim meri mas karim man pikinini. Em mo gutpla.			
25	Karim pikinini em save givim hat wok na hevi lo papa mama. *			
26	Bride price moni lo marit i no save putim hevi lo meri lo karim nupla pikinini time em marit. *			
27	Bride price save givim mo pawa lo man olsem meri I mas stap ananit lo man bilong em , displa pawa tu, long controlim meri lo slip wantaim em.			
28	Man save paitim meri plenti, taim em payim bride pris pinis.			
29	Karim nupla pikinini em bikpla samting lo marit blong wanem, em save strongim marit, meri i no karim pilinini, man inap losim em go painim nupla meri.			
30	Taim meri lo community i no karim onepla pikinini, lo community save tok baksait olsem meri i mas sick or i no fit lo karim pikinini.			
31	<i>Social- Cultural issues influence for not wanting a</i>			

	<p><i>child</i></p> <p>Sapose meri i gat HIV binatang na i karim pikinini, community save tok baksait lo em, olsem em i no gutpla way , em i wrong.</p>			
--	--	--	--	--

*negative question

PART IV: PSYCHOSOCIAL FACTORS

Displa 4pla kwesten nau bai mi laik askim yu em kwesten blong sam liklik, mi lik askim long marit laip blong yu na man blong yu long taim yu bein painim HIV. Wanem samting mitupla toktok bai secret (tok hide) na mi nogat right long tokim narapla, em bai stap lo mitupla yet. Displa kwesten bai helpim mipla ol woklain save long ol problem blong yupla ol meri na em bai helpim mipla long makim gutpla plan lo lukautim yupla ol meri wantaim HIV gut bihain taim. . (Explain each definition of violence as question is being asked.)

32. Man blong yu wantaim family blong em payim bride pris blong yu pinis long family blong yu ?

1. Yes
2. No
3. decline to answer

33. Man blong yu been paitim yu tu ?(usim han blong em long paitim yu, kickim yu, slapim yu, or givim yu blak ai?)

1. Yes
2. No
3. Decline to answer

34. Man blong yu save tok nogutim yu tu taim yupela kros?

1. Yes
2. No
3. Decline to answer

35. Yu been slip (bungim skin wantaim man blong yu (koap)) insait lo las 3 mon?

1. Yes
2. No
3. Decline to answer

36. Man blong yu save forcim yu lo slip (koap) wantaim em taim yu las?
(sexual violence/ marital rape)

1. Yes
2. No
3. decline to answer

37. Yu na man blong yu usim family planning nau?

- 1 Yes
- 2 No (skip to Q 39)

38. Sapose yes, wanem kin?

1. No FP used
2. Condom
3. Pills
4. Injection
5. decline to answer

Nau mi lik askim yu sampla toktok lo yu lo filin blong yu long I gat bel na kamap mama. Mi bai askim yu liklik long bilip blong yu long God, tu. Yu bakim ol displa toktok olsem yu wanbel, yu no save or yu nowanbel lo ol displa toktok me bai tokim yu.

PART V: MOTHERHOOD ROLES AND PROCREATION & RELIGION FACTORS

	Statement	Agree	Not Sure	Disagree
39	Long kamap mama na gat bel em nicpla experience na nomal long laif.			
40	Long karim pikinini em save bringim hope na hamamas na meaning lo laif.			
41	Bilip lo God ken savim pikinini lo kisim HIV time HIV mama i gat bel.			
42	Suppose mi gat bel, em bai plan blong God na present long God olsem me ken karim pikinini			

PART VI: CUES TO ACTION

Nau bai mi askim sampla toktok long servis blong PMTCT (mama i gat bel na wok blong health wok man lo stopim baby i gat HIV) Yu bakim lo displa toktok olsem yu wanbel yu ken tok yes, yu no save or yu nowanbel yu ken tok nogat, lo ol displa toktok me bai tokim yu

HIV knowledge on Vertical transmission and PMTCT (5 items)

	<i>Statement</i>	Yes	I don't know	No
43	Mama husait i gat bel na igat HIV bai OLGETA TIME givim HIV binatang lo nupla pikinini. (N)			
44	Mama husait i gat HIV ken givim HIV binatang lo nupla pikinini i stap inside lo bel blong mama? (Y)			
45	Mama husait igat HIV binatang i ken givim HIV binatang lo pikinini taim em i karim em. (Y)			
46	Mama husait i gat HIV ken givim HIV binatang lo nupla pikinini taim em i givim susu long pikinini. (Y)			
47	I gat marsin i stap long helpim mama i gat HIV i ken daunim chance blong pikinini lo kisim HIV binatang. (Y)			

48. Yu harim toktok blong nupla program ol daunim HIV lo mama i gat bel, i go long nupla pikinini ?

1. Yes

2. No

49. Yu ben harim lo husait? (More than 1 answer)

1. Health worker
2. Books, poster, booklet, Brochures
3. Public media (TV, radio)
4. Peer HIV women (sharing experience and evidence)

50. Yu bin discussim sampla toktok long wari blong yu lo karim pikinini tu, long ol health wok man meri tu or nogat?

1. Yes
2. No

51. Yu bai tok wanem ol health wok manmeri long wok blong long helpim yu na toktok lo wari blong yu lo karim pikinini. ? -----

1. Ol no save toktok lo displa topic lo mi.
2. Ol toktok liklik tasol
3. Ol olsem las long helpim mi lo displa, na sampla taim tokim me nogat lo karim pikinini.
4. Ol helpim mi gud, na mi gat gutpla understanding.

PART VII: FERTILITY DESIRE

Nau lo displa las pat, mi laik askim yu lo hau yu na man blong yu filim ol karim onepla pikinini lo bihain time.

52. Yu ting wanem long tingting blong yu lo karim wanpela piknini bihain time?

1. Mi laikim wanpela piknini bihain time
2. Mi no save
3. Mi tok olsem mi i no inap gat wanpla nupla piknini behain. Em inap.

53. Yu ting wanem lo tingting blong man blong yu lo karim wanpla piknini ol bihain time?

1. Yes em laikim wanpla piknini bihain time.
2. Mi no save
3. Em toktok em las ol mitupla gat piknini bihain time.

Reason for wanting a child

54. Wanem em as tingting(reason blong yu long lakim (karim) wanpela pikinini bilong yu yetlo behain taim? _____

Concerns for not wanting a child

55. Wanem em as tingting blong yu suppose yu las lo karim wanpla pikinini ol bihain taim?

1. Pret ol givim sik lo pikinini
2. Gat bel, karim pikinini bai makim mi painim mo sick na makim sik blong mi go bikpla.
3. mi pret lo givim sik lo man,
4. em bai givim het taim lo painim moni lo suppotim family,
5. nogat pret ,
6. Mi las karim pikinini taim me sick, lo community bai tok baksait,
7. Family blong mi inap, mi no nedim narapla pikinini,
8. Others

56. Suppose yu no bin gat HIV, inap nau bai yu lakim wanpla pikinini blong yu yet?

1. [] Yes

2. [] No

End here and say thank you (bottom)

Em mitupla kam lo pinis blong displa interview (toktok blong mitupla) Mi laik tok tenkyu tru lo time na answer blong yu. Mi understandim olsem sompla question em hard lo answerim, tasol time me harim lo maus blong yupla ol meri na tingting blong yupla, em bai mipla ol health wok manmeri i ken understandim yupla na helpim yupla lo improvim service i go lo yupla na man blong yupla, Tenkyu tru.

Time of interview end:

Additional interview notes:

APPENDIX B

REVISED WHO CLINICAL STAGING OF HIV/AIDS FOR ADULTS AND ADOLESCENTS

Primary HIV infection

- Asymptomatic
- Acute retroviral syndrome

Clinical stage 1

- Asymptomatic
- Persistent generalized lymphadenopathy (PGL)

Clinical stage 2

- Moderate unexplained weight loss (<10% of presumed or measured body weight)
- Recurrent respiratory tract infections (RTIs, sinusitis, bronchitis, otitis media, pharyngitis)
- Herpes zoster
- Angular cheilitis
- Recurrent oral ulcerations
- Papular pruritic eruptions
- Seborrhoeic dermatitis
- Fungal nail infections of fingers

Clinical stage 3

Conditions where a presumptive diagnosis can be made on the basis of clinical signs or simple investigations

- Severe weight loss (>10% of presumed or measured body weight)
- Unexplained chronic diarrhoea for longer than one month
- Unexplained persistent fever (intermittent or constant for longer than one month)

- Oral candidiasis
- Oral hairy leukoplakia
- Pulmonary tuberculosis (TB) diagnosed in last two years
- Severe presumed bacterial infections (e.g. pneumonia, empyema, pyomyositis, bone or joint infection, meningitis, bacteraemia)
- Acute necrotizing ulcerative stomatitis, gingivitis or periodontitis

Conditions where confirmatory diagnostic testing is necessary

- Unexplained anaemia (< 8 g/dl), and or neutropenia (<500/mm³) and or
- Thrombocytopenia (<50 000/ mm³) for more than one month
- All clinical events or conditions referred to are described in the Annexes. The UN defines
- Adolescents as persons aged 10–19 years but, in the present document, the category of
- Adults and adolescents comprises people aged 15 years and over for surveillance purposes

Clinical stage 4

Conditions where a presumptive diagnosis can be made on the basis of clinical signs or simple investigations

- HIV wasting syndrome
- Pneumocystis pneumonia
- Recurrent severe or radiological bacterial pneumonia
- Chronic herpes simplex infection (orolabial, genital or anorectal of more than one month's duration)
- Oesophageal candidiasis
- Extrapulmonary TB
- Kaposi's sarcoma
- Central nervous system (CNS) toxoplasmosis
- HIV encephalopathy

Conditions where confirmatory diagnostic testing is necessary:

- Extrapulmonary cryptococcosis including meningitis
- Disseminated non-tuberculous mycobacteria infection
- Progressive multifocal leukoencephalopathy (PML)
- Candida of trachea, bronchi or lungs
- Cryptosporidiosis
- Isosporiasis
- Visceral herpes simplex infection
- Cytomegalovirus (CMV) infection (retinitis or of an organ other than liver, spleen or lymph nodes)
- Any disseminated mycosis (e.g. histoplasmosis, coccidiomycosis, penicilliosis)
- Recurrent non-typhoidal salmonella septicaemia
- Lymphoma (cerebral or B cell non-Hodgkin)
- Invasive cervical carcinoma
- Visceral leishmaniasis

Source: [www. World Health Organisation](http://www.who.int) 2009

APPENDIX C

Tables of interest that was not included in result

Table 4.26 Percentage and frequency of status of a child after PMTCT and types of family planning used

Bio medical / cue to action variables	Number	Percent
	n = 291	%
<hr/>		
Status of Child after PMTCT	n = 39 ^c	
Positive	17	43.59
Negative	10	25.64
Not tested	12	30.77
Type of Family planning used	n = 85 ⁿ	
Condoms	70	82.35
Pills	3	3.53
Injection (Depo)	12	15.12

^c n = number of respondents who have had received a PMTCT intervention program

ⁿ the number of respondent who currently use contraception

Table 4.27 Association between child's HIV status after PMTCT programme

Biomedical factor	Total n = 291	Desire a child (%)	Not desire a child (%)	Crude OR	CI	P value
Child HIV status after PMTCT	n = 27 ¹					0.037
Positive	17	47.06	52.94			
Negative	10	10.00	90.00	0.13	0.05 – 1.22	0.073

¹ n = total respondent who experiences PMTCT intervention and know their child status (whether dead or alive)

BIOGRAPHY

NAME	Marie Lucy Aska
DATE OF BIRTH	August 30, 1980
PLACE OF BIRTH	Mingendi, Simbu, Papua New Guinea
INSTITUTION ATTENDED	University of Papua New Guinea, Medical Faculty Medical Doctor. 2000 -2005
FELLOWSHIP/ RESEARCH GRANT	World Health Organization (WHO-PNG). PNG National AIDS Council Secretariat (NACS)
PRESENT POSITION	Medical Doctor (Officer on STI/HIV/AIDS treatment and care National Health Department of Papua New Guinea Mt Hagen, Papua New Guinea