DETERMINANTS OF ANTENATAL HIV TESTING AMONG PUNJABI WOMEN OF PAKISTAN.

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ABSTRACT

DETERMINANTS OF ANTENATAL HIV TESTING AMONG PUNJABI WOMEN OF PAKISTAN

HIV and AIDS is a public health concern, the incidence of which is decreasing worldwide as more is known about it's transmission, prevention and treatment. However, Pakistan a Southeast Asian country, is where the incidence is alarmingly increasing by 56% every year which is one of the highest incidences in Asia. Frequent outbreaks are occurring among general population and children, despite otherwise low prevalence. Current focuses are directed at those who are at high risk of contracting the disease such as people who inject drugs, males who have sex with males, transgenders (hijra sex workers) and female sex workers. However, recent HIV outbreaks in the general population directed us to conduct this study with following objectives to as it has never been carried out it Pakistan: To measure HIV antenatal service coverage in Punjab (Pakistan) and describe level of HIV/AIDS related knowledge, awareness & attitudes among women receiving antenatal care. Also to assess association of receiving HIV services during antenatal care with HIV/AIDS knowledge, awareness, attitudes, sociodemographic factors, and other related factors in above province comparing it to few other selected countries in order to aid in policy making to improve factors that are affecting HIV testing uptake especially in pregnant women. Role of prevalence, funding, & policies were also descriptively discussed to provide an as accurate idea of Factors affecting HIV testing uptake in pregnant women of Punjab as possible.

Data was obtained from MICS6-UNICEF survey, a cross-sectional survey carried out to monitor SDG's and MDG's especially related to women and children which was conducted in 2017-18 in the most populated and high HDI province of Pakistan, Punjab. Participants who had given birth in the last two years and had heard of HIV where employed for this study. To compare the Punjabi women, a few other countries where the same survey was carried out during the same time frame were employed to allow for homogeneous comparison. Logistic regression and Multiple logistic regression was utilized to determine factors that affected the uptake have HIV testing in pregnant women of Punjab as well as are other countries (Kyrgyzstan, Laos, and Gambia).

Of all the women who had received antenatal care, only 24% of Punjabi women had heard of HIV despite our sample being highly selective (consisting of more educated and wealthier women).Of these, only 5.52% had received complete HIV ANC testing (counselled before or after the test , offered a test, got tested, and received results). About half the women (50.7%) who had heard of HIV had intermediate level of knowledge about HIV, and less than a quarter had high level of knowledge (23.2%). Most women had negative attitudes towards people living with HIV (58%). On applying multiple logistic regression, it was discovered that women with higher HIV awareness were most likely do uptake HIV testing and this factor was true among women from all countries employed for this study. Rest of the determinants differed across countries. Policies in Pakistan specially, should focus on raising awareness not only among high risk groups but also among the general population and women of childbearing age. Policies regarding provision of HIV testing and integration of it into existing maternal child health programs should also be done to improve HIV testing coverage in pregnant women.

Contents

1. Introduction……………………………………………………………..11

1.1 History of HIV/AIDS…………………………………………………..11

1.2 Mother to child transmission of HIV………………………………..11

1.3 HIV/AIDS global and regional burden ………………………………...13

1.4 HIV and Cancer……………………………………………………...13

1.5 Stages of HIV Epidemic……………………………………………..14

1.6 HIV/AIDS in Pakistan………………………………………………....15

1.7 HIV/AIDS in Kyrgyzstan……………………………………………...16

1.8 HIV/AIDS in Gambia………………………………………….......16

1.9 HIV/AIDS in Laos…………………………………………………….17

1.10 Antenatal HIV testing…………………………………………………17

1.11 90.90.90 UNAIDS target 2020………………………………………..18

1.12 Factors associated with antenatal HIV testing………………………...18

1.13 Rational of research…………………………………………………...20

2. Methods……………………………………………………………….22

2.1 Study design and study population……………………………………22

2.2 Ethical consideration…………………………………………………...24

2.3 Data management and Statistical Analysis……………………………24

3. Results………………………………………………………………..28

3.1 Background information of study participants…………………………28

3.2 Level of HIV/AIDS knowledge, awareness & attitudes……………….34

3.2.1 Knowledge and awareness……………………………………………34

3.2.2 Attitudes…………………………………………………………………38

3.3 HIV Testing services uptake and provision in antenatal care setting……..40

3.4 HIV testing services: Counselling…………………………………….......41

3.5 HIV testing services: Offered a test and getting tested……………………44

3.6 HIV testing services: Offered a test, getting tested and receiving results…………………………………………………………......47

3.7 HIV testing services: Offered a test, getting tested receiving results and post-test counselling………………………………………………50

3.8 HIV testing services: All services…………………………………………53

3.9 Patterns of HIV Indicators across surveys………………………………...58

4. Discussion ………………………………………………………………..61

5.Conclusion…………………………………………………………………69

List of Tables

Table 1 Variables and Indicators……………………………………………….....24

Table 2 General Characteristics of the General & Respondent population of Pakistan…………………………………………….....29

Table 3 General Characteristics of the General & Respondent population of Kyrgyzstan……………………………………..…..30

Table 4 General Characteristics of the General & Respondent population of Laos…………………………………………………...31

Table 5 General Characteristics of the General & Respondent population of Gambia……………………………………………..…32

Table 6 Distribution of characteristics of the women who had received antenatal care and heard of HIV in all countries…………………....33

Table 7 Distribution of knowledge about HIV transmission, misconceptions & comprehensive knowledge about transmission & Mother to child transmission (MTC) among Punjabi women of Pakistan……………..37

Table 8 Distribution of HIV/AIDS related answers to questions on attitudes Among Punjabi women of Pakistan…………………………………..39

Table 9 Factors associated with HIV counselling service of HIV testing among Pakistani women who received antenatal care and had heard of HIV. (Bivariate analysis using logistic regression)…………………………42

Table 10 Factors associated with being offered to be tested and getting tested service of HIV testing among Pakistani women who received antenatal care and had heard of HIV……………………..….46

Table 11 Factors associated with being offered an HIV test, getting tested, and receiving results as part of HIV testing among Pakistani women who received antenatal care and had heard of HIV……………48

Table 12 Factors associated with being offered an HIV test, getting tested, received results, and post-test counselling as part of HIV testing among Pakistani women who availed antenatal care and had heard of HIV……………………………………………………51

Table 13 Factors associated with receiving total HIV coverage as part of HIV testing among Pakistani women who received antenatal care and had heard of HIV……………………………….54

Table 14 Multivariate logistic regression for total HIV coverage among Pakistani women……………………………………………………57

Table 15 Major HIV indicators across MICS surveys over time…………………59

Table 16 Distribution of sociodemographic factors in MICS surveys over time………………………………………………………….60

List of Figures

Figure 1. Location of Pakistan and Punjab province of Pakistan.………………………23

Figure 2. A comparison of total women who have received antenatal care and those who have received antenatal care and heard of HIV…………………..34

Figure 3. Comparison of HIV/AIDS related Knowledge Levels among women of selected countries who have received antenatal care and heard of HIV…………35

Figure 4. Percentage Distribution of positive and negative attitudes in selected countries ……………………………………………………………………..38

Figure 5. Comparison of antenatal HIV coverage across all countries…………………40

Figure 6. Graphical depiction of HIV indicators across MICS surveys.……………….59

Figure 7. HIV-related spending in countries selected in this study....…………………..61

Figure 8. Selected sexual behavior patterns among People who Inject Drugs, Pakistan 2016-2017…......……………………………………………………….66

1 Introduction

1.1 History of HIV/AIDS

HIV(Human Immunodeficiency Virus) was first identified in the 1980s. It is a type of lentivirus, which attacks the immune system in a similar manner as the Simian Immunodeficiency Virus (SIV) attacks the immune systems of monkeys and apes[1]. If not treated, HIV reduces the number of CD4 cells (T cells) in the body, making the person more likely to develop infections or infection-related cancers. These opportunistic infections or cancers take advantage of a very weak immune system and signal that the person has AIDS (Acquired Immunodeficiency Syndrome), the disease of last stage of HIV infection.

The first verified case of HIV is from a blood sample taken from a man in 1959 residing in the Democratic Republic of Congo. In 1981, a few cases of rare diseases was reported among gay men in the US, such as Kaposi's Sarcoma and lung infection caused by an otherwise harmless fungus, Pneumocystis pneumonia[2,3]. No one was able to identify why these cancers and opportunistic infections were spreading, but they concluded that there must be an infectious agent causing them.

At first the gays were stigmatized due to the disease[4].In 1982, scientists realized the disease was also spreading among other populations such as hemophiliacs and heroin users[5,6]. Towards end of that year, the disease was finally named as AIDS[7].

The Centers for Disease Control (CDC) in the United States listed the main at-risk groups in 1983 as: partners of people with AIDS, people who inject drugs, hemophiliacs and people who have recently been to Haiti. Lack of definitive information about HIV and its link to AIDS, inflated the panic and stigma surrounding the epidemic. Soon, people began to talk of a “4-H Club” at risk of AIDS: homosexuals, hemophiliacs, heroin addicts and Haitians, leading to further stigmatisation[8].

1.2 Mother to child transmission of HIV

Transmission of HIV can take place through exchange of body fluids from infected people, such as blood , breast milk, semen and vaginal secretions. HIV can also be transmitted from a mother to her child during preg nancy and delivery. Individuals cannot become infected through ordinary day-to-day contact such as kissing, hug ging, shaking hands, or sharing personal objects, food or water.

Risk factors are Behaviors and conditions that expose individuals to a greater risk of contracting HIV and these are: unprotected anal or vaginal sex; having other sexually transmitted infection (STI) such as syphilis, herpes, chlamydia, gonorrhea and bacterial vaginosis; sharing or contaminated needles, syringes, razors and sharp objects and other injecting equipment and drug solutions when injecting drugs; receiving unsafe injections, blood transf usions and tissue transplantation, and medical procedures that involve unsterile cutting or piercing; and experienc ing accidental needle stick injuries, including among health workers (World Health Organization, WHO)

Transmission of HIV from a HIV-positive mother to her child during either pregnancy, labor, delivery or breastfeeding is called mother-to-child transmission (MTCT). Without any intervention, transmission rates can range from 15% to 45%. This can be reduced to less than 5% with effective interventions during pregnancy, labor, delivery and breastfeeding. These interventions primarily include antiretroviral(ARV) treatment for the mother and a short course of antiretroviral drugs for the baby. They also include measures to prevent HIV in the pregnant woman and appropriate breastfeeding practices(World Health Organization, WHO) such as Caesarean section versus normal delivery and formula milk versus breastmilk are commonly practiced to reduce baby's exposure to maternal HIV.

Immense progress has been made in reducing the number of children born with HIV. After the success of the *Global Plan towards the elimination of new HIV infections among children by 2015 and keeping their mothers alive*, a commitment towards ending pediatric AIDS was adopted in the Political Declaration on Ending AIDS, by United Nations Member States in June 2016. The *Start Free Stay Free AIDS Free* framework is based on achieving new targets for 2020, to achieve an AIDS-free generation, with a focus on the first 0–24 years of age which is based on reducing babies born with HIV to HIV positive mothers and prevention of the transmissibility following delivery as peak mortality occurs between six weeks to four months of age for children who have acquired HIV infection. Also, because young women under the age of 24 years have higher rates of HIV infection than boys and young men of the same age in sub-Saharan Africa due to social determinants that increase their vulnerability to acquiring HIV, access to adolescent-friendly service and education regarding consent and safe practice has become essential. Globally, children and adolescents are lagging behind adults in receiving antiretroviral treatment which can help them grow up and achieve a normal lifespan with effective treatment. Case-finding of children who have been exposed to HIV is critical, and strategies to advance this include early testing during immunization visits, encouraging adult family members to bring their children for testing and provider-initiated testing at clinics and hospitals where children are seen for illnesses or poor nutrition. Providing access to adolescent-friendly services for both testing and treatment is also critical, with social support to address difficult issues of disclosure and peer pressure and information to help them make informed decisions about their care. Adolescence is the only age group in which AIDS-related deaths are increasing. Accelerating development of better and more tolerable age-appropriate pediatric formulations of antiretroviral medicines is a high priority to achieve the AIDS Free part of the commitment.

1.3 HIV/AIDS global and regional burden

According to Global Health Observatory data, HIV has affected more than 75 million and killed over 32 million of them and by the end of 2018, there were around 38 million living with it. Around 0.8% of the global population is infected and living with HIV. Although WHO African region is the most afflicted region, recently the WHO Middle Eastern and South East Asian regions are experiencing an increase in incidence as well despite well-established prevention and knowledge about prevention of acquisition of the disease. People and populations most at risk are: Men who have sex with men (MSM), people who inject drugs (PWID), Sex workers, prisoners, transgender people, women and girls, children, young people and adolescents, people with disabilities.

1.4 HIV and Cancer

People with HIV are at a higher risk of some types of cancer as compared to uninfected people of similar age[9]. Infection with HIV weakens the immune system and reduces the body's ability to fight viral infections that may lead to cancer[10, 15, 16]. Also, because people infected with HIV have compromised immune systems, both immunosuppression and inflammation may have direct or indirect roles in the development of some cancers that are elevated in people infected with HIV [10,17].

Cancers much likely to be found in HIV positive people are known as "HIV-associated cancers." Three of these cancers are known as "acquired immunodeficiency syndrome (AIDs)-defining cancers/malignancies" which are: Kaposi sarcoma, aggressive B-cell non-Hodgkin lymphoma, and cervical cancer. A diagnosis of any of these cancers in someone infected with HIV confirms diagnosis of AIDS. In comparison to the general population, people infected with HIV are 500 times much more likely to be diagnosed with Kaposi sarcoma, 12 times more likely to be diagnosed with non-Hodgkin lymphoma, and women are 3 times more likely to be diagnosed with cervical cancer[10].Also, people infected with HIV have a higher risk of developing several other types of cancer (collectively called "non–AIDS-defining cancers/malignancies")[9, 10] which include cancers of the anus, liver, oral cavity/pharynx, and lung, and Hodgkin lymphoma [11, 12]. Furthermore, HIV-infected persons are more likely to be infected with following viruses than people in the general population[18–20].

The viruses that are most likely to cause cancer in people with HIV are[17]: Kaposi sarcoma-associated herpesvirus (KSHV), also known as human herpesvirus 8 (HHV-8), which causes Kaposi sarcoma and some subtypes of lymphoma, Epstein-Barr virus (EBV), which causes some subtypes of non-Hodgkin and Hodgkin lymphoma, Human papillomaviruses (HPV), high-risk types of which cause cervical cancer, most anal cancers, and oropharyngeal, penile, vaginal, and vulvar cancer, Hepatitis B virus (HBV) and hepatitis C virus (HCV), which both cause liver cancer.

In addition, HIV positive status increases risk of dying from cancer. HIV-infected people with a range of cancer types are more likely to die than HIV-uninfected people with these cancers[13, 14]. Thus in order to prevent such cancers and reduce deaths due to them, it is imminent that the spread of HIV is prevented ideally, at birth.

1.5 Stages of HIV Epidemic

UNAIDS and partners formulated a classification that categorizes HIV epidemics into three levels: low-level, concentrated, and generalized[(30)]. Different countries have different information needs in each epidemic stage, and these needs may shift if the epidemic develops and moves from one type to another.

Low-level epidemics are epidemics with an HIV prevalence assumed to be less than five percent in all known su bpopulations presumed to practice high-risk behaviors. Countries in the low-level stage of the epidemic might ini tially focus their surveillance efforts on populations with higher levels of HIV-transmitting behaviors, such as se x workers, truckers, migrant workers, military personnel, men who have sex with men, and drug injectors. The a im is to monitor the trends and levels of infection within high risk groups and also to map the dynamics of infe ction and sexual mixing patterns that are construed as high-risk or low-risk in nature.

Concentrated epidemics are epidemics with an HIV prevalence that has surpassed five percent in one or more hi gh-risk populations but is less than one percent among pregnant women.

Generalized epidemics are epidemics in which HIV has spread far beyond the subpopulations with higher-risk be haviors, which are now heavily infected. Prevalence among pregnant crosses over one percent. In such epidemic, infection levels in rural population may approach to similar levels as those in urban areas. Most countries in sub-Saharan Africa have an established epidemic that goes beyond just populations practicing high-risk behaviors. The generalized nature of the epidemic in this region calls for surveillance systems that give a cross-sectional profile of the infection in the general population.

1.6 HIV/AIDS in Pakistan

HIV prevalence in Pakistan according to UNAIDS was 0.11% in 2018 and the incidence was 0.11% as well[31]. However, there has been a dramatic increase in incidence since 2010 reflected by the high incidence to prevalence ratio of 13.41(as of 2018) in addition to the percentage change in AIDS-related deaths since 2010 (369%). Despite low prevalence, Pakistan is in concentrated epidemic phase as injection drug users have HIV as a national prevalence of 27.2% (weighted prevalence is 37.8%); followed by transgender sex workers at 5.2% and then male sex workers at 1.6%. The prevalence in female sex workers remains low at 0.6%. The geographic trend of key populations is from major urban cities and provincial capitals, expanding over time to smaller cities and peripheries[21].37.7% IDU(injection drug users) report being currently married and around half of them as ever married with a majority of them having at least 1-2 children[22]. A modelling study in 2007 showed that IDUs were more likely to transmit HIV to their spouses and regular sex partners than to sex workers in any city in Pakistan[23], altogether increasing risk of transmitting HIV to their unborn children making them a bridging population through which HIV can enter the general population, where 'bridging' is defined as transmission of HIV from high-risk core groups to non-core groups[24]. Other high risk groups were reportedly married too as per social norms, culture and religion (Islam prohibits sexual relations outside marriage strongly) of the society and males having sex with males or bisexual men never come up about their sexuality due to social setup, with some northern areas being tolerable towards men having sex with other men. The prevalence of high risk habits is hidden but not unpracticed or unheard of in the conservative society of Pakistan[32].

Recently, in July 2018, 1,198 individuals of whom 80 per cent were children, tested positive for HIV/AIDS[25]. Similarly, in March, 2019, an outbreak of HIV in a single village of 5,000 residents was reported in Sargodha, in Punjab province, Pakistan, where the prevalence of HIV infection increased from 1% to around 13% in 6 months[26]. An article from a local newspaper in June 2019, also reported that 70 to 90 cases come in daily in 5 major cities in Punjab but the issue is not receiving any attention as the government fears a 'bad reputation'[27]. At the same time, only 10 percent of pregnant women who are aware of their HIV status receive ARV(antiretroviral therapy-medication for HIV which reduce transmission to baby so that he/she has a higher likelihood to be born HIV free). If this remains the case, Pakistan can soon become a country with rampant epidemic of HIV where the bridging population may be pregnant women. Lack of HIV testing services will aggravate it further. This thesis focuses on antenatal HIV testing services in Pakistan and compares it to other selected countries which are Kyrgyzstan, Gambia and Laos. The above countries were chosen for comparison for the following reasons: all are low-middle and low income countries[(33)], the survey and data used for analysis were carried out and compiled at the same time i.e.2017.Also, Kyrgyzstan and Gambia are predominantly Muslim majority countries(>85% and >96% respectively), like Pakistan(>96% Muslim majority) [(34-36)] providing some sociocultural homogeneity with Pakistan. The province of Punjab was specifically chosen as unlike other countries, MICS6 was carried out in Pakistan in different provinces at different times due to very diverse ethnicities and sociocultural setups. The province of Punjab was specifically chosen for this study as it is the most populous and high HDI(Human Development Index) province of Pakistan.

1.7 HIV/AIDS in Kyrgyzstan

Prevalence of HIV in Kyrgyzstan is 0.2% as of 2018. The incidence to prevalence ratio is 6.68 and the country is in concentrated epidemic phase with an HIV prevalence of 12.4 percent among IDU's(injection drug users), next are prisoners at 11.3%, men who have sex with men at 6.3%, and sex workers with a prevalence of 2%. There has also been a downward trend in number of new HIV infections since 2010. Also, 88% of the women who know their status received HIV related therapy during antenatal period greatly reducing the chance of passing HIV to their children[(32)]. Southern Kyrgyzstan suffered an HIV outbreak in 2007 when 11 people tested positive at once, 9 of them children. The cities of Osh and Bishkek have joined a group of cities who have signed to what is known as the "Declaration of Paris" where the mayors commit to putting cities on the Fast-Track to ending the AIDS epidemic through a set of commitments. Those commitments include achieving the UNAIDS 90–90–90 targets, which will result in 90% of people living with HIV knowing their HIV status, 90% of people who know their HIV-positive status on antiretroviral treatment and 90% of people on treatment with suppressed viral loads, keeping them healthy and reducing the risk of HIV transmission by 2020[28-29].

1.8 HIV/AIDS in Gambia

HIV prevalence of HIV is 1.6% in Gambia according to data collected in 2018. The ratio of incidence to prevalence is 8.48 and there has been a 3% decrease in number of infections since 2010. The country is currently in a generalized epidemic phase due to which distinction of high risk groups is less useful. Although only 30% PLHIV(people living with HIV) were receiving HIV treatment, however, 69% of pregnant women were receiving HIV therapy. The current national strategic plan aims to reduce new HIV infections by 50% in the general population, by 50% among key populations, mother-to-child transmission of HIV at six weeks from 10% to 3% and to increase the coverage of antiretroviral therapy from 21% to 90% of all people living with HIV by 2019[37].

1.9 HIV/AIDS in Laos

HIV prevalence in Laos is 0.3% and the incidence to prevalence ratio is 4.77. People who know that they are HIV positive are around 85% out of whom 54% are on treatment. 35% of HIV positive pregnant women received HIV treatment in 2018. The HIV incidence trend is going downward since 2010. The prevalence of HIV in high risk groups is about 1% in sex workers and 2.8 % in males who have sex with males[38]. There is very limited data on HIV prevalence in other high-risk groups. In some provinces of Laos however, the prevalence of HIV in high-risk groups has been found out to be as high as 7% in sex workers. From 2010 to 2018 there has been an increase in pregnant women with HIV accessing ARV(anti-retroviral therapy) from 8% in 2010 to 35% in 2018 along with government investment into HIV related programs which has risen from 7% in 2011 to 31% of annual budget in 2015 .

1.10 Antenatal HIV testing

In simple words, antenatal HIV testing means screening for HIV during pregnancy. As per cost studies, a 2016 report by the WHO reported that antenatal HIV testing is beneficial in all prevalence and resource settings thus should be part of universal maternal and child healthcare services[39]. The first of the United Nations' 90-90-90 targets to e nd the HIV epidemic is for 90% of people living with HIV to learn their HIV status. HIV testing is therefore es sential to achieving "the first 90". Around 21% of people with HIV are unaware of their infection. The only wa y to determine a person's HIV status is for them to have an HIV test. In many countries, critical gaps exist in H IV services, including prevention, testing and treatment. These efforts often fail to reach the people at greatest ri sk – namely adolescent girls and young women, men, and key population groups including men who have sex with men, sex workers, people who inject drugs, transgender people, and people in prison or closed settings. HI V testing services include the full range of services that should be provided together with HIV testing: which ar e inclusive of: counselling (pre-test information and post-test counselling); linkage to appropriate HIV prevention, treatment and care services, and other clinical and support services; and coordination with laboratory services to support quality assurance and the delivery of correct results.

All HIV testing services should continue to be provided in line with WHO's essential 5 Cs: **C**onsent, **C**onfide ntiality, **C**ounselling, **C**orrect test results, and **C**onnection/linkage to prevention, care and treatment[40].

1.11 90.90.90 UNAIDS target 2020

Whereas previous AIDS targets sought to achieve incremental progress in the response, the aim in the post-2015 era is to end the AIDS epidemic by 2030.

In December 2013, the UNAIDS Program Coordinating Board called on UNAIDS to support country- and region-led efforts to establish new targets for HIV treatment scale-up beyond 2015. At the global level, stakeholders assembled in a variety of thematic consultations focused on civil society, laboratory medicine, pediatric HIV treatment, adolescents and other key issues.

The key focus is on achievable targets as follows:

- By 2020, 90% of all people living with HIV will know their HIV status.
- By 2020, 90% of all people with diagnosed HIV infection will receive sustained antiretroviral therapy.
- By 2020, 90% of all people receiving antiretroviral therapy will have viral suppression[41].

1.12 Factors associated with antenatal HIV testing

The persistent high rates of pediatric HIV transmission in sub-Saharan African countries have led to an increased scaling-up of access to antenatal health care services in order to reduce mother-to-child HIV transmission (MTCT). This has led to MTCP prevention programs (PMTCT) being integrated with antenatal care (ANC) services as a means of reaching out to pregnant women who are HIV positive and those who are vulnerable to HIV infection. The rationale for the integration of these services is to increase the coverage of PMTCT services as pregnant women who use ANC services can also benefit from PMTCT services [42]. It is only logical thus accepted that the goal of PMTCT cannot be met without increasing antenatal HIV testing uptake [43]. World Health Organization guidelines state that routine antenatal HIV testing should be offered to all pregnant women during their first contact with maternal health care services [44]. This is particularly crucial in countries where the incidence of the disease as well as subnational concentrated epidemics are occurring. In order to improve uptake of the PMTCT program in Pakistan, it is imperative that the factors responsible for the low uptake of antenatal HIV testing be identified to prevent a generalized epidemic outbreak and that is only possible through monitoring and surveillance. Determinants of antenatal HIV testing can be classified into community- and individual-level predisposing, who are vulnerable to HIV infection. Low antenatal HIV testing uptake has been linked to individual-level predisposing factors such as area of residence, education, age, marital status, unwanted pregnancy, religion and parity [45-47]. It has been identified that place of residence is significantly associated with health service utilization. Pregnant women living in urban areas have are more likely to go through antenatal HIV testing than those from rural areas [48-50] due to easier accessibility of health care services [51]. Another sociodemographic factor that has shown to be strongly associated with antenatal HIV testing is maternal age. Older women are noted to be more likely to test for HIV during pregnancy than younger women [46,50]. This has been attributed to older women having a more awareness of HIV/AIDS [52-55] or having better resources, which allows them better access to maternal health care services [56, 57]. Another factor that is explored is pregnancy wantedness and acceptance by the community [58]. Studies from Zambia and Uganda have shown that teenager girls who are pregnant are more likely to experience violence from parents, be expelled from school and experience discrimination and stigma [59, 50]. The fact that ANC services in sub-Saharan African countries are not often oriented to the needs of teenage mothers makes the health risks associated with their pregnancies and HIV more pronounced than those of older women [60,61]. Although not explored extensively, this can be the case in other cultures and low or low middle income countries too. Similarly, higher parity has also shown association with increased uptake of antenatal HIV testing [62]. The marital status of pregnant women is also an important predisposing factor for both HIV testing and use of ANC services. Mashuba et al. [63] Married women are also more likely to be tested for HIV during pregnancy if they contribute to more decisions in the household, if they are educated and exposed to media. However, married women may have a lower perceived risk of acquiring HIV infection as they assume that partners are mutually faithful which is a potential barrier to HIV testing [64, 65]. A number of enabling factors, including socioeconomic factors (e.g. wealth, education, media exposure and physical access to health facility), HIV/AIDS factors (e.g. HIV awareness, HIV stigma) and perceived risk and need factors (e.g. history of HIV testing, acquaintance with a person living with HIV) have been linked to antenatal HIV testing in sub-Saharan African countries [45,46,66]. There is evidence in the literature that pregnant women from wealthier households are more likely to have antenatal HIV testing than their counterparts from poorer households. This may be due to women from wealthier households having the ability to afford the cost of health care services and being more likely to be educated, and women who are educated being more likely to have access to information and enjoy greater freedom to seek health care without seeking the permission of their husbands or men of the household [45,67,68]. It has also been a consistent finding that those with the highest levels of educational attainment are more likely to be tested for HIV during pregnancy than those at the lower end of the education spectrum [69, 70] ,partly due to better access to mass media. Several authors have documented the role of mass media in disseminating information on health-related issues through radio, television, newspapers and magazines [66, 72]. In recent years, HIV prevention and sexual and reproduction health promotion information have been disseminated through posters, mobile phones and the internet [73] and this intervention has led to increase knowledge relating to mother-to-child HIV transmission and PMTCT programs. Due to the stigma attached to HIV/AIDS, pregnant women living with HIV and those who perceive themselves to be at risk of HIV infection may be less likely to have antenatal HIV testing within the integrated services[74, 75]. Understanding and addressing individual and community barriers to antenatal HIV testing could potentially contribute to the current goal of eliminating the MTCT of HIV before it reaches the epidemic stage towards which Pakistan is advancing quickly.

HIV testing uptake during pregnancy varies throughout the world with percentages reaching around 90% in developed countries but much lower in low middle-income countries such as less than 0.1% in Pakistan [76], 65.4% in Gambia according to analysis of DHS carried out in 2013-14[77], greater than 56% in Kyrgyzstan according to MICS 6 carried out in 2018[78], about 8% in Laos as stated by findings from MICS6/DHS 2017[79].

1.13 Rational of research and study objectives

HIV is a great Global Health Challenge currently especially in low middle-income countries outside of Africa where the incidence is increasing dramatically such as Philippines and Pakistan in Asia have the highest incidence as of 2018[80]. Safety regarding exchange of body fluids whether it be intercourse or screened blood transfusions or breastfeeding which is only possible to if a person is educated about HIV and it's transmission and getting an HIV test are recognized ways to prevent and detect HIV early. Knowledge about mother-to-child transmission of HIV and screening for HIV during pregnancy to get timely treatment are only ways to prevent mother to child transmission which is life saving for the children and generations who can be born HIV free throughout the world. There have been dramatic downward trends in HIV incidence in most developed countries and African countries where HIV testing which were being funded heavily by developed countries after facing generalized epidemics. However, in other low and middle-income countries especially in Southeast Asia such as Pakistan are unable to access this service and most likely not know of their HIV status which may lead the country to a generalized epidemic phase of HIV as the number of new HIV cases are rising rampantly in high risk groups who are socially engaged with women of general population(with or without marriage) and sex workers who can act as bridging populations as they have in other countries.

Although prevalence of HIV is 0.11% in the general Pakistani population, it is well established in high-risk groups and is steeply rising since 2010. There have also been 2 major outbreaks of HIV in general population of rural areas within a year with one affecting more than 800 children out of a 1000 affected[26,81].

National AIDS control program (NACP) was founded in Pakistan in 1986/7[82] but testing in pregnant women has not been made an integral part of antenatal care or maternal child healthcare programs to date, although a bill has been proposed to pass the act, but no action has been taken so[83]. In context, due to low resources, lower prevalence, sociocultural beliefs, negative attitudes and low knowledge of HIV transmission are a few obstacles that have hindered progress of antenatal HIV testing. Due to above-mentioned reasons, a study is needed to investigate that: how many women of reproductive age that have received antenatal care have adequate knowledge of HIV and its mother-to-child transmission in Pakistan? What are the attitudes of these women towards people living with HIV? Also, how many women were covered by this test? What were the factors that determined which women were tested versus those who were not? Understanding these issues is critical to design and implement a universal HIV testing policy and program for pregnant women to prevent HIV from becoming a generalized epidemic and having an HIV free generation, the aim of 2030 UNAIDS target to end AIDS.

Study objectives of this thesis are as follows:

1- To measure HIV antenatal service coverage in Punjabi (Pakistan), Laotian, Kyrgyzstani & Gambian women.

2- To describe level of HIV/AIDS knowledge, awareness & attitudes among women receiving antenatal care in above countries.

3- To assess association of receiving HIV services during antenatal care with HIV/AIDS knowledge, awareness, attitudes, sociodemographic factors, and other related factors in above countries.

4- To describe and compare role of prevalence, funding, & policies in abovementioned countries.

2 METHODS

2.1 Study design and study population:

Data was obtained From the MICS (multiple indicator cluster survey), which was initiated after the World Summit for Children Declaration in 1990 developed by UNICEF in the 1990s as an international multi-purpose household survey program to support countries in collecting internationally comparable data on a wide range of indicators on the situation of children and women. MICS surveys measure key indicators that allow countries to generate data for use in policies, program, and national development plans, and to monitor progress towards the Sustainable Development Goals (SDGs) and other internationally agreed upon commitments. Many international organizations especially UNICEF aided in the preparation of MICS methodology, which was then implemented in over 100 countries. The questionnaire for women of reproductive age (aged 15-49) was employed in this thesis. The complete questionnaire is present on the link given below:

https://mics.unicef.org/tools?round=mics6

As Pakistan is a diverse, multi-ethnic society, data from a single area is not representative and cannot be applied to the whole country(no homogenous ethnicity, language or culture except religion). The Lancet HIV found that 74 countries saw increases in age-standardized rates of new infections between 2005 and 2015, including Egypt, Pakistan, Kenya, the Philippines, Cambodia, Mexico, and Russia[84]. Thus, data from the most populous province of Pakistan developing at the highest rate (high Human development Index within the country following capital territory of Islamabad) was utilized which is experiencing the highest increase of new HIV cases per year as well as burden(75,000/150,000) [85] according to National AIDS Program. Figure 2-1 below shows location of Pakistan and the province from which study population was selected.

Figure 1. Location of Pakistan and Punjab province of Pakistan

The sample for the MICS Punjab, 2017-18 was designed to provide estimates for many indicators on the situation of children and women in Punjab for urban and rural areas, and for all 36 districts of Punjab. The urban and rural areas within each district were identified as the main sampling strata, and the sample of households was selected in two stages. Within each stratum, a specified number of census enumeration areas were selected systematically with probability proportional to size. Using the listing of households from the Census 2017 for sample enumeration area, provided by Pakistan Bureau of Statistics, a systematic sample of 20 households was drawn in each sample enumeration area. The total sample size was 53,840 households in 2,692 sample clusters.

Six questionnaires were used in the survey out of which one was utilized for this thesis: questionnaire for individual women administered in each household to all women age 15-49 years. In the initial phase of the fieldwork, the selection of 20 households from each cluster was done. From the MICS6 model English version, the questionnaires were customized and translated into Urdu and were pre-tested in Chakwal and Chiniot districts during October 2017. Based on the results of the pre-test, modifications were made to the wording and translation of the questionnaires. Parts of MICS Punjab (and other countries), 2017-18 questionnaire used in this thesis is provided in Appendix. Similar procedures were followed by all participant countries and countries selected for this study to allow homogenous comparability of data. Details of study design and methodology of other chosen countries are given elsewhere.(https://microdata.worldbank.org/index.php/catalog/3559)

2.2 Ethical consideration

The project was approved and carried out in coordination with Bureau of Statistics, Punjab, Pakistan wherein members made sure the survey was carried out in accordance to standards of ethics by providing confidentiality and anonymity of participants and so on. As the data was secondary data, permission to use was asked for via e-mail after submission of the research proposal for the study. Access was granted to open source data after review and acceptance of the research proposal.

2.3 Data management and Statistical Analysis

At the beginning after downloading the relevant datasets, data cleaning was performed using Microsoft Excel and variables were classified and categorized. The detailed description of variables used in this thesis are given in Table 1.

VARIABLES	**DESCRIPTION**	**CLASSIFICATION**
DEMOGRAPHIC	**DESCRIPTION**	
AGE	Age at the time of survey	Grouped as:15-24,25-29,>30 years
AREA	Area of residence	Urban or Rural
EDUCATION	Highest level of education attained	None or early childhood, Primary, Lower Secondary, Upper Secondary, Higher/Post Secondary diploma.
WEALTH QUINTILE	Composite measure of a household's cumulative living standard (measured by MICS 6 team)(86)	Poorest, Second, Third, Fourth, Richest
KNOWLEDGE OF HIV		
	HIV acquisition reduced by having single uninfected sex partner who has no other sex partners	Yes=1, No=0, Do not know=0
	HIV acquisition by mosquito bite	Yes=0, No=1, Do not know=0
	HIV acquisition reduced by condom use	Yes=1, No=0, Do not know=0
	HIV acquisition by sharing food	Yes=0, No=1, Do not know=0
	HIV acquisition because of supernatural means	Yes=0, No=1, Do not know=0
	Healthy looking have HIV	Yes=1, No=0, Do not know=0

Mother to child transmission		
	During pregnancy	Yes=1, No=0, Do not know=0
	During delivery	Yes=1, No=0, Do not know=0
	By breastfeeding	Yes=1, No=0, Do not know=0
	Drugs to reduce risk of transmission	Yes=1, No=0, Do not know=0
Summarized scores	Scores to each question were summed out of a max of 10. Higher score meant the individual was more knowledgeable. KAP model was used to classify the scores as: A score of 8-10(high Knowledge), 5-7 (medium knowledge) and 0-4(low knowledge)	High Knowledge Medium Knowledge Low Knowledge
ATTITUDES		
	Buy from HIV+	Yes=1, No=0, Do not know=0
	HIV+ children continue to go to school	Yes=1, No=0, Do not know=0
	Hesitation of taking HIV test due to fear of social reaction	Yes=0, No=1, Do not know=0
	People talk bad about PLHIV	Yes=0, No=1, Do not know=0
	HIV+ lose respect in society	Yes=0, No=1, Do not know=0
	Ashamed if someone in family is HIV+	Yes=0, No=1, Do not know=0
	Fear of HIV acquisition via saliva	Yes=0, No=1, Do not know=0
Summarized scores	Scores to each question were summed out of a max of 7. As data was not normally distributed, mean was used as cut off point and scores totaling mean and above were considered positive, scores below mean were considered negative attitudes. ref	Positive Negative
TESTING SERVICES		
Pretest counselling	Counselling about modes of transmission and protection against HIV including mother to child transmission before offering test	Received/Yes=1, Not-received/No=0, Do not know/remember=0
Offered test and tested for HIV	If individual was offered test and got tested for HIV during antenatal care.	Received/Yes=1, Not-received/No=0, Do not know/remember=0
Offered test, tested & received results	If individual was offered test and got tested and received results of the test for HIV during antenatal care.	Received/Yes=1, Not-received/No=0, Do not know/remember=0

Post-test counselling	Counselling about modes of transmission and protection against HIV/ of partners (if individual is HIV +) including mother to child transmission after test and of treatment options(if individual is HIV +) .	Received/Yes=1, Not-received/No=0, Do not know/remember=0
HIV antenatal testing score	HIV antenatal testing is complete only if all above services (either pretest or post-test counselling) are provided to an individual.	Only those who were tested for all services were included in the total coverage.
MEDIA EXPOSURE	Score was calculated based on total exposure to newspaper/magazine reading, watching television, & listening to radio frequency. Max attainable score was 9. Median score was derived and those below were categorized as having low exposure, those above were categorized as having high exposure.(Median=3)	Low exposure = 0-2 score, High exposure=3-9.
OTHER		
Source of Antenatal care	Type of healthcare facility utilized for antenatal care	Government, Private, Home
No. of ANC visits	Visits for antenatal care purposes to healthcare facility during pregnancy	1-2, 3-4, 5+
Parity	No. of children at time of survey	1, 2, 3+
Intention of pregnancy	Whether pregnancy was intended for or not	Wanted/ Unwanted
Ever used contraceptives	If respondent was currently pregnant, her response to ever used contraceptives was noted. If she was not pregnant, response to currently using contraceptives was noted	Yes/No

Descriptive analysis was performed to assess sociodemographic variables using Microsoft Excel. Data was then imported to and further analysis was carried out in RStudio. Pearson's chi-square test was then utilized for bivariate analysis of all categorical variables. P for trend was also calculated for variables with more than two, ordinal categories. As the outcome was binary, simple logistic regression was used to obtain OR's and CI for bivariate analysis for all HIV related services for respective countries. Multivariate logistic regression was then carried out using only variables which were found to be significant with the total HIV coverage only. All p values less than 0.05 were considered statistically significant.

It is essential to note that the UNICEF-MICS data is provided as a database without any analysis of associations or any processing. Reports published by the authorities publish indicators as proportions of population only with no further processing of raw data. It is later up to researchers who carry out analysis after drafting a study design and proposal.

3 RESULTS

3.1 Background information of study participants

Table 2. shows the shows the general characteristics of the participants from Pakistan and the subsequent tables of the participants from Kyrgyzstan, Gambia and Laos. From Pakistan, of the 3372 respondents, although majority belonged to the rural areas, it was still not comparable to the participants who had received antenatal care. Similarly, women aged 25 and more participated more and had heard of HIV. Much educated and women belonging to higher wealth quintiles were more likely to have heard of HIV and thus belong to the respondent population which lead to the respondent and thus study population to be highly selective, not necessarily reflecting the picture of the general population of all women receiving antenatal care.

The background characteristics of Kyrgyzstani women who had received antenatal care and heard of HIV versus those who had received antenatal care were not very different as is depicted in Table no.3.

Table 4. shows the general characteristics of the participants of Laos. Of the 1858 respondents, although majority belonged to the Rural areas, it was still not comparable to the participants who had received antenatal care. Similarly, women aged 25 and more participated more and had heard of HIV. Much educated and women belonging to a higher economic class were more likely to be of the respondent population. The background characteristics of women of Laos are pretty similar to Pakistan.

The background characteristics of Gambian women who had received antenatal care and heard of HIV versus those who had received antenatal care were not very different like the Kyrgyzstani woman, as is depicted in Table no.5.

Table 6 depicts all the remaining characteristics of study population by country. Most women from all countries received antenatal care from and gave birth in government settings except for Pakistani women who utilized more of Private services. Gambian women preferred at home antenatal care most among all women. Most pregnancies were wanted by the women in all countries. Contraception use was highest among Laotian women at 56.3 % and least used by Gambian women (30.7%). Most women in all countries visited antenatal health facilities more than 5 times with at least 89.8% Kyrgyzstani women visiting ANC facilities more than 5 times versus 52% of Gambian women. Majority of Gambian women (63.4 %) followed by Pakistani women (45.8%) had 3 or more children and only 27.4 percent of Laotian women. Pakistani and Laotian women had high media exposure as compared to other countries. A comparison of how many women had received antenatal care versus those women who had heard of HIV and utilized healthcare is given in Figure 2. Levels of Knowledge and attitudes have been compared illustratively in Figures 3 and 4 respectively.

Table 2 General Characteristics of the General & Respondent population of Pakistan.

		Participants who received Antenatal care, n (%)		Participants who received Antenatal care & had heard of HIV, n (%)		p-value
Characteristics						
Area						
	Rural	9989	(71.5)	1952	(57.8)	
	Urban	3975	(28.4)	1420	(42.1)	**<0.001**
N		13964	(100)	3372	(100)	
Age						
	15-24	3531	(25.2)	569	(16.8)	
	25-29	4650	(33.3)	1231	(36.5)	
	30-49	5783	(41.4)	1572	(46.6)	**<0.001**
N		13964	(100)	3372	(100)	
Education						
	None	5283	(37.8)	229	(6.7)	
	Primary	2948	(21.1)	390	(11.5)	
	Secondary					
	Lower	1571	(11.2)	405	(12.0)	
	Upper	2110	(15.1)	896	(26.5)	
	Higher	2052	(14.6)	1452	(43.0)	**<0.001**
N		13964	(100)	3372	(100)	
Economic Rank						
	Poorest	2758	(19.7)	84	(2.4)	
	Second	2953	(21.1)	286	(8.4)	
	Middle	3116	(22.3)	684	(20.2)	
	Fourth	2791	(19.9)	1021	(30.2)	
	Richest	2346	(16.8)	1297	(38.4)	**<0.001**
		13964	(100)	3372	(100)	

Table 3 General Characteristics of the General & Respondent population of Kyrgyzstan.

		Participants who received Antenatal care, n (%)	Participants who received Antenatal care and had heard of HIV, n (%)	p-value
Characteristics				
Area				
	Rural	806 (59.8)	779 (59.6)	
	Urban	540 (40.1)	529 (40.4)	0.08
N		1346 (100)	1308 (100)	
Age				
	15-24	383 (28.4)	395 (30.2)	
	25-29	418 (31.0)	418 (32.0)	
	30-49	545 (40.4)	495 (37.8)	0.17
N		1346 (100)	1308 (100)	
Education				
	None	0 (0.0)	0 (0.0)	
	Primary	292 (21.6)	286 (21.3)	
	Secondary			
	Lower	140 (10.4)	135 (10.0)	
	Upper	501 (37.2)	478 (35.5)	
	Higher	411 (30.5)	409 (30.4)	
	Missing	2 (0.15)	0 (0.0)	0.91
N		1346 (100)	1308 (100)	
Economic Rank	**Economic Rank**			
	Poorest	290 (21.5)	271 (20.1)	
	Second	237 (17.6)	227 (16.9)	
	Middle	263 (19.5)	258 (19.2)	
	Fourth	341 (25.3)	338 (25.1)	
	Richest	215 (16.0)	214 (15.9)	0.55
N		1346 (100)	1308 (100)	

Table 4. General Characteristics of the General & Respondent population of Laos.

		Participants who received Antenatal care, n (%)		Participants who received Antenatal care and had heard of HIV, n (%)		p-value
Characteristics						
Area						
	Rural	2510	(69.3)	1042	(56.0)	
	Urban	1110	(30.7)	816	(43.9)	**<0.001**
N		3620	(100)	1858	(100)	
Age						
	15-24	1579	(43.6)	714	(38.4)	
	25-29	1054	(29.1)	595	(32.0)	
	30-49	987	(27.3)	549	(29.6)	**0.002**
N		3620	(100)	1858	(100)	
Education						
	None	465	(12.8)	73	(3.9)	
	Primary	1339	(37.0)	517	(27.8)	
	Secondary					
	Lower	931	(25.7)	515	(27.7)	
	Upper	375	(10.4)	286	(15.4)	
	Higher	510	(14.1)	467	(25.1)	
	Missing	0	(0.0)	0	(0.0)	**<0.001**
N		3620	(100)	1858	(100)	
Economic Rank						
	Poorest	720	(19.9)	162	(8.7)	
	Second	865	(23.9)	301	(16.2)	
	Middle	763	(21.1)	408	(21.9)	
	Fourth	658	(18.2)	458	(24.6)	
	Richest	614	(17.0)	529	(28.5)	**<0.001**
N		3620	(100)	1858	(100)	

Table 5. General Characteristics of the General & Respondent population of Gambia.

		Participants who received Antenatal care, n (%)		Participants who received Antenatal care and had heard of HIV, n (%)		p-value
Characteristics						
Area						
	Rural	2372	(62.9)	2325	(62.8)	
	Urban	1399	(37.1)	1380	(37.3)	**0.02**
N		3771	(100.0)	3705	(100.0)	
Age						
	15-24	1220	(32.3)	1194	(32.2)	
	25-29	988	(26.2)	974	(26.3)	
	30-49	1563	(41.4)	1537	(41.5)	**0.007**
N			(0.0)	3705	(100.0)	
Education						
	None	2075	(55.0)	2027	(54.7)	
	Primary	701	(18.6)	690	(18.6)	
	Secondary					
	Lower	512	(13.6)	511	(13.8)	
	Upper	331	(8.8)	329	(8.9)	
	Higher	152	(4.0)	148	(4.0)	**0.05**
N		3771	(100.0)	3705	(100.0)	
Economic Rank						
	Poorest	1353	(35.9)	1323	(35.7)	
	Second	883	(23.4)	864	(23.3)	
	Middle	680	(18.0)	669	(18.1)	
	Fourth	470	(12.5)	467	(12.6)	
	Richest	385	(10.2)	382	(10.3)	0.06
N		3771	(100.0)	3705	(100.0)	

Table 6. Distribution of characteristics of the women who had received antenatal care and heard of HIV in all countries.

	Pakistan		Laos		Kyrgyzstan		Gambia	
	n	(%)	n	(%)	n	(%)	n	(%)
Source of ANC								
Govt	1071	(31.8)	1482	(79.8)	1284	(98.2)	2694	(72.7)
Pvt	1975	(58.6)	50	(2.7)	24	(1.8)	162	(4.4)
Home/other	326	(9.7)	326	(17.5)	-		849	(22.9)
N	3372	(100.0)	1858	(100.0)	1308	(100.0)	3705	(100.0)
Intention								
Wanted	2739	(81.2)	1677	(90.3)	1269	(97.0)	2875	(77.6)
Unwanted	633	(18.8)	181	(9.7)	39	(3.0)	830	(22.4)
N	3372	(100.0)	1858	(100.0)	1308	(100.0)	3705	(100.0)
Using/Ever used CC								
Yes	1707	(50.6)	1046	(56.3)	435	(33.3)	1137.	(30.7)
No	1665	(49.4)	812	(43.7)	873	(66.7)	2568	(69.3)
N	3372	(100.0)	1858	(100.0)	1308	(100.0)	3705	(100.0)
No. of ANC visits								
1 to 2	316	(9.4)	140	(7.5)	22	(1.7)	261	(7.0)
3 to 4	816	(24.2)	491	(26.4)	111	(8.5)	1519	(41.0)
5 +	2240	(66.4)	1227	(66.0)	1175	(89.8)	1925	(52.0)
N	3372	(100.0)	1858	(100.0)	1308	(100.0)	3705	(100.0)
Parity								
1	941	(27.9)	717	(38.6)	298	(22.8)	705	(19.0)
2	885	(26.2)	632	(34.0)	342	(26.1)	650	(17.5)
3 +	1546	(45.8)	509	(27.4)	668	(51.1)	2350	(63.4)
N	3372	(100.0)	1858	(100.0)	1308	(100.0)	3705	(100.0)
Media Exposure								
Low	850	(25.2)	393	(21.2)	646	(49.4)	1307	(35.3)
High	2522	(74.8)	1464	(78.8)	662	(50.6)	2398	(64.7)
N	3372	(100.0)	1858	(100.0)	1308	(100.0)	3705	(100.0)
Levels of Knowledge								
Low	879	(26.1)	175	(9.4)	76	(5.8)	379	(10.2)
Moderate	1709	(50.7)	1276	(68.7)	627	(47.9)	1990	(53.7)
High	784	(23.3)	406	(21.9)	605	(46.3)	1336	(36.1)
N	3372	(100.0)	1858	(100.0)	1308	(100.0)	3705	(100.0)
Attitude								
Positive	1416	(42.0)	1159	(62.4)	749	(57.3)	1805	(48.7)
Negative	1956	(58.0)	699	(37.6)	559	(42.7)	1900	(51.3)
N	3372	(100.0)	1858	(100.0)	1308	(100.0)	3705	(100.0)

3.2 Level of HIV/AIDS knowledge, awareness & attitudes.

3.2.1 Knowledge and awareness

Less than a quarter of Pakistani women who had received antenatal care had ever heard of HIV which is the least among all the countries being compared putting them in high danger due to lack of knowledge about the ever increasing disease.

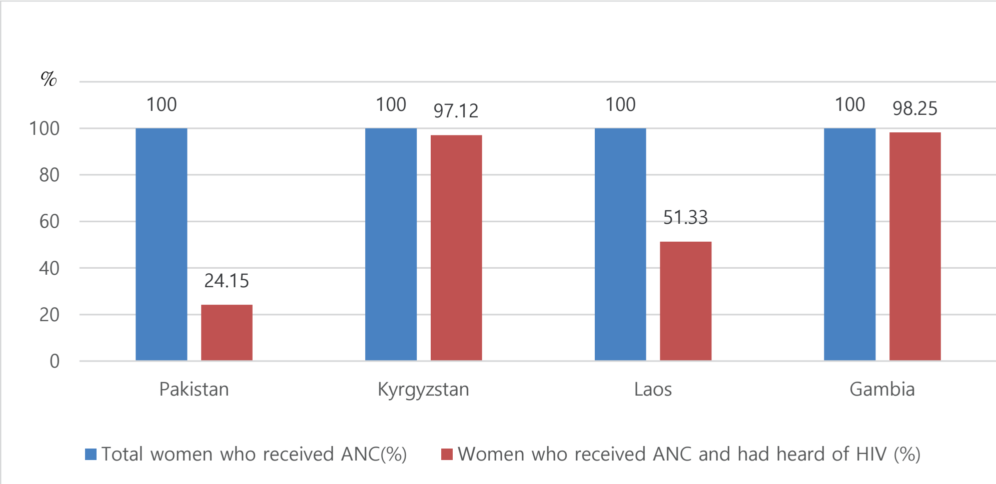

Figure 2. A comparison of total women who have received antenatal care and those who have received antenatal care and heard of HIV.

Description of HIV/AIDS related knowledge and attitudes among women who have heard of HIV was calculated by summing the number of correct responses by the women which could range from 0 to 10. They were categorized further based on KAP (knowledge, attitudes and practices) scoring system into low (<5 out of 10 questions correct), medium (5 to 7 out of 10 questions correct) and high(>7.5 out of 10 questions correct).

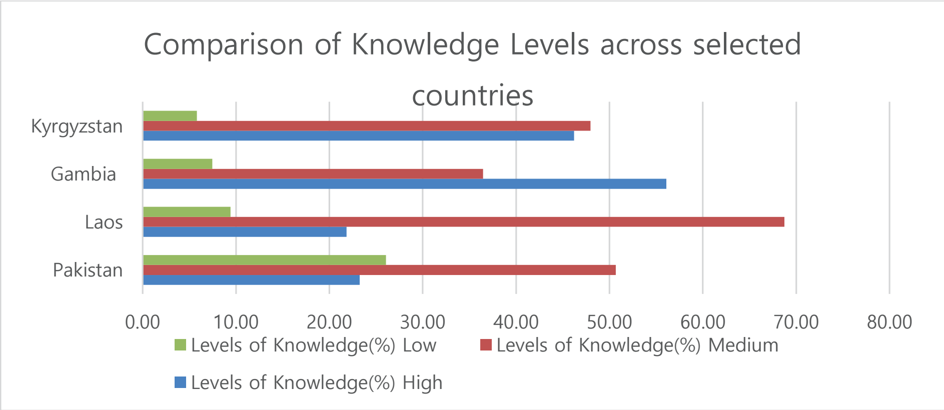

Figure 3. Comparison of HIV/AIDS related Knowledge Levels among women of selected countries who have received antenatal care and heard of HIV.

The above figure reflects the proportion of respondents who fall into each category of HIV related knowledge which is based on the scoring as described beforehand. Women from all respective countries who had heard of HIV had medium-level knowledge about the virus except for Gambia, where most women had a higher level of HIV-related knowledge. However, a higher fraction of women from Pakistan had lower levels of HIV knowledge as compared to other countries. Nearly equal proportion of Kyrgyzstani women had medium and high levels of HIV related knowledge. The percentage of women with high level of Knowledge are somewhat similar in Pakistan and Laos, but Laos has more number of women with medium level of HIV knowledge than Pakistan. This again puts Pakistani women at risk and thus their children too as even those little number of women who had ever heard of HIV have deficient knowledge about the virus and it's consequences.

Table no. 7 below describes the proportion of Pakistani women who answered HIV related queries correctly and incorrectly. For convenience purposes, similar tables related to other countries have been added to the Annex. Section of this thesis. As can be analyzed from the table below, less than half the women who had heard of HIV were able to reject 2 common misconceptions regarding HIV and knew that a healthy-looking person can be HIV positive. In Gambian women, although 98% of the women had heard about HIV, only half of them were able to refute 2 of the 3 misconceptions and knew that a healthy appearing person can have HIV. Similarly, Majority of Kyrgyzstani women knew of HIV but 60% were able to refute 2 wrong statements of HIV and knew that a healthy- looking person can be HIV positive. More than half of Laotian women had heard of HIV but only 8% could adequately refute misconceptions and know that HIV status does not depend upon perception of general health of the person.

Knowledge about mother to child transmission of HIV on the other hand is adequate in over 60% of the Punjabi Pakistani women, but only half the women knew there are drugs to prevent the transmission of the virus to babies. The situation was similar in other countries where knowledge about mother to baby transmission was good but fewer women knew that there are medicines that can save their to-be-borns from HIV (Laos 75% versus 30% women knew about safe drugs to reduce transmission of HIV, 80% versus 68% Gambian women, and 87% versus 73% Kyrgyzstani women).

Table 7. Distribution of knowledge about HIV transmission, misconceptions & comprehensive knowledge about transmission & Mother to child transmission (MTC) among Punjabi women of Pakistan.

Question	Percentage with correct answer (%)	Percentage reporting with wrong response or no response (Misconceptions) (%)
Have you ever heard of HIV/AIDS?	24.15	75.85
Knowledge of route of transmission among who have ever heard of HIV		
1. Can a person get HIV infection from mosquito bites?	57.00	43.00
2. Can a person get HIV infection by sharing a meal with someone who is infected?	48.43	51.57
3. Can people get HIV because of witchcraft or other supernatural means?	77.00	33.00
4. Can a healthy-looking person have HIV infection?	69.50	30.50
Reject 2 most common misconceptions & know a healthy-looking person can be HIV+	46.00	54.00
Knowledge of prevention and control		
1. Can the risk of HIV transmission be reduced by having sex with only one faithful uninfected partner?	76.10	23.90
2. Does condom use reduce risk of HIV transmission?	61.68	38.32
HIV transmission can be prevented by having one faithful partner & using condom every time	54.86	45.14
Knowledge of mother to child transmission (MTC) of HIV.		
1. Can HIV be transmitted from a mother to her baby during pregnancy?	73.93	26.07
2. Can HIV be transmitted from a mother to her baby during delivery?	70.31	29.69
3. Can HIV be transmitted from a mother to her baby by breastfeeding?	68.74	31.26
HIV can be transmitted by at least one of the three means	80.00	20.00
HIV can be transmitted by all three means	60.20	39.80
4. Are there any special drugs that a doctor or nurse can give woman with HIV to reduce risk of transmission to the baby?	48.63	51.37
HIV can be transmitted by at least one of the three means & risk can be reduced by taking special drugs during pregnancy	48.64	51.36
HIV can be transmitted by breastfeeding & risk can be reduced by taking special drugs during pregnancy	43.06	56.94
Do not know any specific means of HIV transmission from mother to child	20.00	80.00

3.2.2 Attitudes

The Figure 3-3 given below illustrates the share of people who have positive and negative attitudes towards PLHIV (people living with HIV) and towards HIV in general. Pakistani women tend to have more negative attitudes as compared to the rest of the countries. Laos and Kyrgyzstan have larger proportions of women with positive attitudes towards PLHIV. Gambia however, has a nearly 50 % of women with positive and negative attitudes. Distribution of responses to questions related to attitudes and stigma towards PLHIV by Punjabi Pakistani women are given in Table 8. Responses recorded by women of other nationalities are given in the Tables which are in the annex. Section.

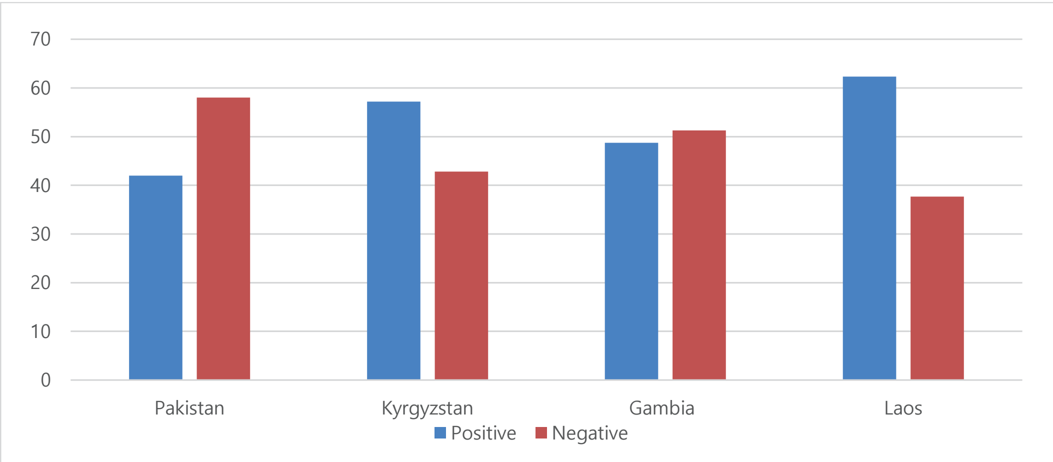

Figure 4. Percentage Distribution of positive and negative attitudes in selected countries

Table 8. Distribution of HIV/AIDS related answers to questions on attitudes among Punjabi women of Pakistan.

Question	Yes (%)	No (%)
1. Would you buy fresh vegetables from a shopkeeper or vendor if he/she has HI V from him/her?	42.29	57.71
2. Do you think children living with HI V should be allowed to attend school wit h children who do not have HIV?	46.30	53.97
3. Do you think people hesitate to take a n HIV test because they are afraid of ho w people will react if it is positive?	64.98	35.02
4. Do you think people talk badly about people living with HIV, or are thought to be living with HIV?	65.51	34.49
5. Do people living with HIV or thought to be living with HIV lose the respect of other people?	61.65	38.35
6. Do you agree or disagree with the foll owing statement: I would be ashamed if someone in my family had HIV.	42.70	57.30
7. Do you fear that you could get HIV if you come in contact with saliva of a pe rson living with HIV?	56.73	43.27

3.3 HIV Testing services uptake and provision in antenatal care settings

HIV testing as mentioned before consists of counselling, being offered an HIV test and getting tested, thereafter receiving results, and getting post-test counselling after reception of results. It is therefore only logical to measure uptake of all services to identify if one is lacking or up to mark and factors affecting each of them to understand in depth. The following Figure 5 compares antenatal HIV coverage across all countries. It depicts provision of complete HIV services to a pregnant women when she visits a health facility, or is visited by a health worker.

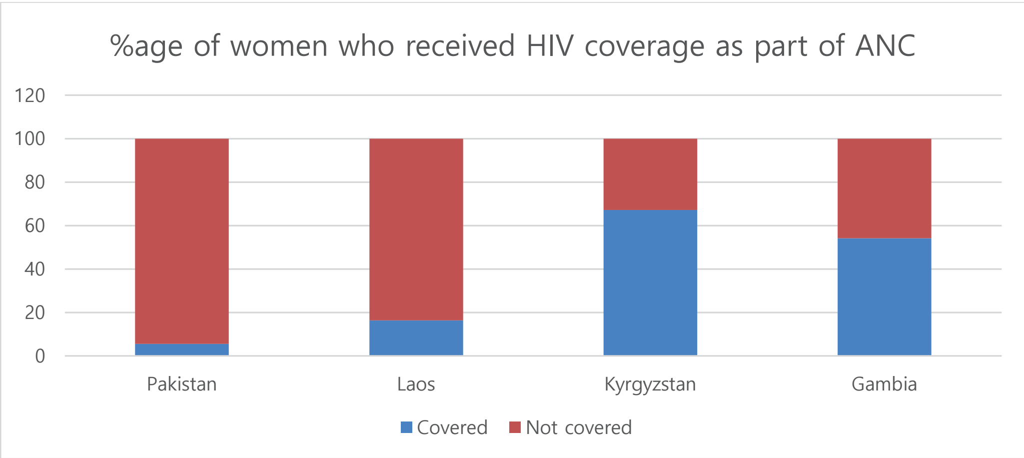

Figure 5. Comparison of antenatal HIV coverage across all countries

3.4 HIV testing services: Counselling

Counselling is when a pregnant lady is informed about HIV, it's sources and routes of transmission and risk factors when she comes in contact with antenatal care facility through a community or healthcare worker. Table 9 below depicts association of each of the services as well as overall uptake of all services combined. In Pakistan, only 8.01% of the women received counselling about modes of transmission of HIV before being offered a test. It was found that women with more wealth($p<0.01$), higher education (p for trend=0.03), and higher HIV specific knowledge (OR=6.38, CI: 4.14-10.23) and with higher media exposure(OR=1.49, CI:1.10-2.07) were more likely to receive counselling than others. Results of all services from other countries are provided in the annex section and can be referred to over there. Different factors were associated with counselling in different countries (Tables in annex), for instance, In Kyrgyzstan, rural women, wealthier women, those who had ever used contraceptives and those who had 1 child or more than 3 children, were more likely to be counselled. In case of Laos, sociodemographic and other factors were significantly correlated to a woman receiving counselling. Gambian women were similar to Laotian women who were likely to be counselled if they were educated, living in urban areas, of older age, visited healthcare facilities fore more ANC visits and had higher levels of HIV specific knowledge.

Table 9 Factors associated with HIV counselling service of HIV testing among Pakistani women who received antenatal care and had heard of HIV. (Bivariate analysis using logistic regression)

		Counselling (before offering test) (A)		Not counselled		OR	(95%CI)	p for trend
	N	**N (%)**		**N (%)**				
Total	**3372**	**270 (8.01)**		**3102 (91.9)**				
FACTORS		n	(%)	n	(%)			
Age								
15-24	569	45	(7.9)	524	(92.1)	1		0.6
25-29	1231	93	(7.6)	1138	(92.4)	0.95	0.66-1.39	
30-49	1572	132	(8.4)	1440	(91.6)	1.07	0.76-1.50	
p-value		0.7						
Area								
Urban	1420	122	(8.6)	1298	(91.4)	1		
Rural	1952	148	(7.6)	1804	(92.4)	0.86	0.67-1.10	
p-value		0.4						
Education level								
None/Preschool	229	13	(5.7)	216	(94.3)	1		**0.03**
Primary	390	29	(7.4)	361	(92.6)	1.33	0.69-2.71	
Lower secondary	405	24	(5.9)	381	(94.1)	1.05	0.53-2.16	
Upper secondary	896	72	(8.0)	824	(92.0)	1.45	0.82-2.79	
Higher	1452	132	(9.1)	1320	(90.9)	1.66	0.96-3.13	
p-value		0.161						
Wealth quintile								
Poorest	84	5	(6.0)	79	(94.0)	1		**0.01**
Second	286	18	(6.3)	268	(93.7)	1.06	0.41-3.29	
Middle	684	44	(6.4)	640	(93.6)	1.09	0.46-3.21	
Fourth	1021	82	(8.0)	939	(92.0)	1.38	0.60-4.01	
Richest	1297	121	(9.3)	1176	(90.7)	1.63	0.71-4.69	
p-value		**<0.01**						
Source of ANC								
Govt	1071	84	(7.8)	987	(92.2)	1		
Pvt	1975	170	(8.6)	1805	(91.4)	1.11	0.85-1.46	
Home/other	326	16	(4.9)	310	(95.1)	0.61	0.34-1.02	
p-value		0.5						
Intention								
Wanted	2739	219	(8.0)	2520	(92.0)	0.99	0.73-1.38	
Unwanted	633	51	(8.1)	582	(91.9)	1		
p-value		0.3						
Using/Ever used CC								
Yes	1707	128	(7.5)	1579	(92.5)	0.87	0.68-1.12	
No	1665	142	(8.5)	1523	(91.5)	1		
p-value		0.3						

No. of ANC visits								
1 to 2	316	24	(7.6)	292	(92.4)	1		0.25
3 to 4	816	56	(6.9)	760	(93.1)	0.9	0.55-1.50	
5 +	2240	190	(8.5)	2050	(91.5)	1.13	0.74-1.80	
p-value		0.3						
Parity								
1	941	84	(8.9)	857	(91.1)	1		
2	885	75	(8.5)	810	(91.5)	0.95	0.68-1.31	0.11
3 +	1546	111	(7.2)	1435	(92.8)	0.8	0.59-1.06	
p-value		>0.1						
Media Exposure								
Low	850	51	(6.0)	799	(94.0)	1		**0.01**
High	2522	219	(8.7)	2303	(91.3)	1.49	1.10-2.07	
p-value		**0.02**						
Levels of Knowledge								
Low	879	24	(2.7)	855	(97.3)	1		**<0.001**
Moderate	1709	127	(7.4)	1582	(92.6)	2.86	1.87-4.56	
High	784	119	(15.2)	665	(84.8)	6.38	4.14-10.23	
p-value		**<0.01**						
Attitude								
Positive	1416	114	(8.1)	1302	(91.9)	1.24	0.97-1.60	0.94
Negative	1956	156	(8.0)	1800	92.02	1		
p-value		>0.07						

OR: Odd's ratio ; CI: Confidence Interval

3.5 HIV testing services: Offered a test and getting tested

The next service which is part of HIV antenatal care testing after counselling is being offered testing and getting tested for it which like counselling, only 8.13 percent of the women received. Factors that were associated with uptake of this service were determined to be education level of the women, where there was not a specific group of women who were more likely to be tested, but likelihood increased as levels of education increased ($p<0.001$), similar to wealth quintile depicting socioeconomic status ($p<0.02$) as depicted in Table 10. Women who received antenatal care at home or other places than government or private setups were less likely to be offered an HIV test and be tested for it (OR:0.41, CI:0.21-0.73). Also, women with more ANC visits were more likely to be offered the test and get tested with increasing ANC visits ($p<0.02$). Women with more number of children were less likely to be offered an HIV test and be tested. Antenatal HIV test was most likely to be offered to women with higher HIV knowledge. More Kyrgyzstani women who belong to an older age group lived in urban areas delivered in government hospitals had a high media exposure and high levels of HIV specific knowledge with more children were more likely to be offered a test and get tested. Gambian women shared the same characteristics and associations like Kyrgyzstani women to those whom HIV test was offered and they were tested. Laotian women like the other were affected by sociodemographic as well as individual characteristics, however, higher levels of HIV related knowledge were not associated with increased likelihood of being offered an HIV test and getting tested.

Table 10. Factors associated with being offered to be tested and getting tested service of HIV testing among Pakistani women who received antenatal care and had heard of HIV.

		Offered test & tested (B)		Not Offered test & not tested		OR	(95%CI)	p for trend
	N	N (%)		N (%)				
Total	**3372**	**274 (8.13)**		**3098 (91.87)**				
FACTORS		n	(%)	n	(%)			
Age								
15-24	569	44	(7.7)	525	(92.3)	1		0.5
25-29	1231	112	(9.1)	1119	(90.9)	1.19	0.84-1.73	
30-49	1572	118	(7.5)	1454	(92.5)	0.97	0.68-1.40	
p-value		0.3						
Area								
Urban	1420	121	(8.5)	1299	(91.5)	1		
Rural	1952	153	(7.8)	1799	(92.2)	0.9	0.70-1.15	
p-value		0.2						
Education level								
None/Preschool	229	15	(6.6)	214	(93.4)	1		**<0.001**
Primary	390	24	(6.2)	366	(93.8)	0.94	0.49-1.86	
Lower secondary	405	13	(3.2)	392	(96.8)	0.47	0.22-1.01	
Upper secondary	896	73	(8.1)	823	(91.9)	1.27	0.73-2.33	
Higher	1452	149	(10.3)	1303	(89.7)	1.63	0.97-2.94	
p-value		**<0.001**						
Wealth quintile								
Poorest	84	4	(4.8)	80	(95.2)	1		**<0.001**
Second	286	18	(6.3)	268	(93.7)	1.34	0.48-4.75	
Middle	684	38	(5.6)	646	(94.4)	1.18	0.46-4.00	
Fourth	1021	78	(7.6)	943	(92.4)	1.65	0.66-5.52	
Richest	1297	136	(10.5)	1161	(89.5)	2.34	0.95-7.76	
p-value		**0.02**						
Source of ANC								
Govt	1071	91	(8.5)	980	(91.5)	1		
Pvt	1975	171	(8.7)	1804	(91.3)	1.02	0.78-1.34	
Home/other	326	12	(3.7)	314	(96.3)	0.41	0.21-0.73	
p-value		0.9						
Intention								
Wanted	2739	220	(8.0)	2519	(92.0)	0.94	0.69-1.29	
Unwanted	633	54	(8.5)	579	(91.5)	1		
p-value		0.7						
Using/Ever used CC								
Yes	1707	138	(8.1)	1569	(91.9)	0.99	0.77-1.27	
No	1665	136	(8.2)	1529	(91.8)	1		
p-value		0.9						

No. of ANC visits								
1 to 2	316	20	(6.3)	296	(93.7)	1		**0.002**
3 to 4	816	45	(5.5)	771	(94.5)	0.86	0.51-1.52	
5 +	2240	209	(9.3)	2031	(90.7)	1.52	0.97-2.52	
p-value		**<0.02**						
Parity								
1	941	90	(9.6)	851	(90.4)	1		
2	885	82	(9.3)	803	(90.7)	0.97	0.70-1.322	**0.05**
3 +	1546	102	(6.6)	1444	(93.4)	0.67	0.50-0.90	
p-value		**<0.01**						
Media Exposure								
Low	850	62	(7.3)	788	(92.7)	1		0.3
High	2522	212	(8.4)	2310	(91.6)	1.17	0.87-1.58	
p-value		0.4						
Levels of Knowledge								
Low	879	47	(5.3)	832	(94.7)	1		**<0.001**
Moderate	1709	128	(7.5)	1581	(92.5)	1.43	1.02-2.04	
High	784	99	(12.6)	685	(87.4)	2.56	1.79-3.70	
p-value		**<0.01**						
Attitude								
Positive	1416	122	(8.6)	1294	(91.4)	1.12	0.87-1.43	0.38
Negative	1956	152	(7.8)	1804	(92.2)	1		
p-value		>0.07						

3.6 HIV testing services: Offered a test, getting tested and receiving results

The third service considers being offered an HIV test, getting tested and receiving results which means knowing your HIV status, without which the whole process is futile. It is found out that 7.71 % of the women who had heard of HIV and received antenatal care, received results in addition to previous services. Associations between increasing levels of education and wealth were seen to be consistently affecting all services and did affect these HIV test services as well. Also, women with more HIV related knowledge were also much more likely to use all services up to now. Those had more than one child, were more likely to not receive results in addition to not getting offered an HIV test or being tested. Women having more number of ANC visits are more likely to be offered, tested and know their HIV serostatus too. The results are shown in Table 11. In other countries, most factors which were affecting the previous service were also associated with getting results more or less.

Table 11. Factors associated with being offered an HIV test, getting tested, and receiving results as part of HIV testing among Pakistani women who received antenatal care and had heard of HIV.

		(B) + received results (C)		Not (B) + not received results		OR	(95%CI)	p for trend
	N	N (%)		N (%)				
Total	**3372**	**260**	**(7.71)**	**3112**	**(92.29)**			
FACTORS								
Age		n	%	n	%			
15-24	569	43	(7.6)	526	(92.4)	1		0.5
25-29	1231	104	(8.4)	1127	(91.6)	1.13	0.79-1.65	
30-49	1572	113	(7.2)	1459	(92.8)	0.95	0.66-1.38	
p-value		0.5						
Area								
Urban	1420	118	(8.3)	1302	(91.7)	1		
Rural	1952	142	(7.3)	1810	(92.7)	0.85	0.65-1.10	
p-value		0.3						
Education level								
None/Preschool	229	16	(7.0)	213	(93.0)	1		**<0.001**
Primary	390	23	(5.9)	367	(94.1)	0.89	0.46-1.79	
Lower secondary	405	12	(3.0)	393	(97.0)	0.44	0.20-0.95	
Upper secondary	896	70	(7.8)	826	(92.2)	1.21	0.70-2.23	
Higher	1452	140	(9.6)	1312	(90.4)	1.52	0.91-2.75	
p-value		**<0.001**						
Wealth quintile								
Poorest	84	4	(4.8)	80	(95.2)	1		**<0.001**
Second	286	17	(5.9)	269	(94.1)	1.26	0.45-4.49	
Middle	684	37	(5.4)	647	(94.6)	1.14	0.44-3.89	
Fourth	1021	71	(7.0)	950	(93.0)	1.5	060-5.00	
Richest	1297	131	(10.1)	1166	(89.9)	2.25	0.92-7.45	
p-value		**<0.01**						
Source of ANC								
Govt	1071	86	(8.0)	985	(92.0)	1		
Pvt	1975	162	(8.2)	1813	(91.8)	1.02	0.78-1.35	
Home/other	326	12	(3.7)	314	(96.3)	0.44	0.23-0.78	
p-value		0.9						
Intention								
Wanted	2739	208	(7.6)	2531	(92.4)	0.92	0.67-1.27	
Unwanted	633	52	(8.2)	581	(91.8)	1		
p-value		0.6						

Using/Ever used CC								
Yes	1707	130	(7.6)	1577	(92.4)	0.97	0.76-1.25	
No	1665	130	(7.8)	1535	(92.2)	1		
p-value		0.9						
No. of ANC visits								
1 to 2	316	20	(6.3)	296	(93.7)	1		**0.004**
3 to 4	816	42	(5.1)	774	(94.9)	0.8	0.47-1.42	
5 +	2240	198	(8.8)	2042	(91.2)	1.44	0.91-2.38	
p-value		**<0.02**						
Parity								
1	941	86	(9.1)	855	(90.9)	1		
2	885	77	(8.7)	808	(91.3)	0.95	0.69-1.31	**0.006**
3 +	1546	97	(6.3)	1449	(93.7)	0.67	0.49-0.90	
p-value		**<0.01**						
Media Exposure								
Low	850	58	(6.8)	792	(93.2)	1		0.26
High	2522	202	(8.0)	2320	(92.0)	1.17	0.88-1.58	
p-value		0.3						
Levels of Knowledge								
Low	879	46	(5.2)	833	(94.8)	1		**<0.001**
Moderate	1709	120	(7.0)	1589	(93.0)	1.37	0.97-1.96	
High	784	94	(12.0)	690	(88.0)	2.47	1.72-3.59	
p-value		**<0.01**						
Attitude								
Positive	1416	112	(7.9)	1304	(92.1)	1.05	0.81-1.35	0.71
Negative	1956	148	(7.6)	1808	(92.4)	1		
p-value		>0.07						

3.7 HIV testing services: Offered a test, getting tested, receiving results and getting post-test counselling.

Table 12. shows that only 4.60 Pakistani women out of every hundred who availed antenatal care in pregnancy and had ever known of HIV received post-test counselling accompanied with presented with an offer of an HIV test, getting tested and collecting results. Determinants of the abovementioned service are a higher level of education ($p=0.03$) and higher HIV related knowledge ($p<0.01$). There is also an increased likelihood of getting tested and post-test counselling in wealthier women (p for trend=0.03). Among Gambian women and Laotian women most sociodemographic and individual factors played a role in whether they were receiving post test counseling or not in Gambian women intention of pregnancy however did not play a part but women with positive attitudes towards people living with HIV were more likely to receive the service. Similarly, Laotian women who had a better socioeconomic standard, positive attitudes, Higher media exposure better HIV related knowledge and had used contraceptives were more likely to receive HIV post-test counseling. Post-test counseling in Kyrgyzstani women was associated With a higher age group, better education, receiving antenatal care from a government source, increased antenatal care visits, better awareness of HIV and higher media exposure attitudes and other factors did not show any association between pregnant woman receiving post-test counseling.

Table 12. Factors associated with being offered an HIV test, getting tested, received results, and post-test counselling as part of HIV testing among Pakistani women who availed antenatal care and had heard of HIV.

		B+C+ postest counselling (D)		B+C+ postest Counselling not pro vided		OR	CI	p for trend
	N	**N (%)**		**N (%)**				
Total	**3372**	**155 (4.60)**		**3217 (95.4)**				
FACTORS		n	(%)	n	(%)			
Age								
15-24	569	27	(4.7)	542	(95.3)	1		0.4
25-29	1231	82	(6.7)	1149	(93.3)	0.94	0.59-1.53	
30-49	1572	73	(4.6)	1499	(95.4)	0.98	0.63-1.57	
p-value		**0.048**						
Area								
Urban	1420	69	(4.9)	1351	(95.1)	1		
Rural	1952	86	(4.4)	1866	(95.6)	0.95	0.68-1.32	
p-value		0.6						
Education level								
None/Preschool	229	8	(3.5)	221	(96.5)	1		**0.02**
Primary	390	15	(3.8)	375	(96.2)	1.11	0.47-2.78	
Lower secondary	405	8	(2.0)	397	(98.0)	0.56	0.20-1.53	
Upper secondary	896	44	(4.9)	852	(95.1)	1.43	0.70-3.31	
Higher	1452	80	(5.5)	1372	(94.5)	1.61	0.82-3.66	
p-value		**0.03**						
Wealth quintile								
Poorest	84	3	(3.6)	81	(96.4)	1		**0.03**
Second	286	12	(4.2)	274	(95.8)	1.18	0.37-5.28	
Middle	684	24	(3.5)	660	(96.5)	0.98	0.33-4.20	
Fourth	1021	40	(3.9)	981	(96.1)	1.10	0.39-4.62	
Richest	1297	76	(5.9)	1221	(94.1)	1.68	0.61-6.96	
p-value		0.1						
Source of ANC								
Govt	1071	49	(4.6)	1022	(95.4)	1		
Pvt	1975	98	(5.0)	1877	(95.0)	1.08	0.77-1.56	
Home/other	326	8	(2.5)	318	(97.5)	0.52	0.23-1.06	
p-value		0.7						
Intention								
Wanted	2739	128	(4.7)	2611	(95.3)	1.10	0.73-1.72	
Unwanted	633	27	(4.3)	606	(95.7)	1		
p-value		0.7						
Using/Ever used CC								
Yes	1707	76	(4.5)	1631	(95.5)	0.94	0.68-1.29	
No	1665	79	(4.7)	1586	(95.3)	1		
p-value		0.8						

No. of ANC visits								
1 to 2	316	15	(4.7)	301	(95.3)	1		0.23
3 to 4	816	27	(3.3)	789	(96.7)	0.69	0.37-1.34	
5 +	2240	113	(5.0)	2127	(95.0)	1.07	0.63-1.93	
p-value		0.1						
Parity								
1	941	42	(4.5)	899	(95.5)	1		0.57
2	885	49	(5.5)	836	(94.5)	1.25	0.82-1.92	
3 +	1546	64	(4.1)	1482	(95.9)	0.92	0.62-1.39	
p-value		>0.05						
Media Exposure								
Low	850	34	(4.0)	816	(96.0)	1		0.34
High	2522	121	(4.8)	2401	(95.2)	1.21	0.83-1.81	
p-value		0.4						
Levels of Knowledge								
Low	879	30	(3.4)	849	(96.6)	1		**<0.001**
Moderate	1709	62	(3.6)	1647	(96.4)	1.06	0.69-1.68	
High	784	63	(8.0)	721	(92.0)	2.47	1.60-3.91	
p-value		**<0.01**						
Attitude								
Positive	1416	66	(4.7)	1350	(95.3)	1.03	0.74-1.42	0.88
Negative	1956	89	(4.6)	1867	(95.4)	1		
p-value		>0.07						

3.8 HIV testing services: All services

Table 13. depicts the overall service uptake of HIV which as described above, consists of: either pretest counselling or post-test counselling and getting offer of test from the healthcare or antenatal care provider, getting tested for HIV and receiving results of the test. Only 5.52 percent of Punjabi women of Pakistan who received antenatal care and had heard of HIV received total HIV testing coverage. Factors influencing these were: levels of general education a woman had received and the wealth class she belonged to. Higher the HIV knowledge a woman had, more likely she was to receive HIV testing service. The p for trend showed no association between frequency of ANC visits made and HIV testing . For Kyrgyzstani women determinants of complete HIV testing were found out to be increasing age, antenatal care received from a government source, more number of ANC visits, more media exposure and having a high HIV awareness, all of which increased the likelihood off receiving HIV services. Factors that were significantly associated with women from Laos being provided with HIV coverage were social demographic factors and all other factors except intention. Also, more the parity, less likely were the women to receive HIV antenatal services. In Gambian settings, all community and individual based determinants were significantly associated with HIV services and women who intended pregnancies were less likely to test for HIV.

Table 13. Factors associated with receiving total HIV coverage as part of HIV testing among Pakistani women who received antenatal care and had heard of HIV.

		Total Coverage A+B+C/B+C+D (E)		No coverage received		OR	(95%CI)	p for trend
	N	**N (%)**		**N (%)**				
Total	**3372**	**186 (5.52)**		**3186 (94.48)**				
FACTORS		n	(%)	n	(%)			
Age								
15-24	569	29	(5.1)	540	(94.9)	1		0.5
25-29	1231	66	(5.4)	1165	(94.6)	1.05	0.68-1.67	
30-49	1572	91	(5.8)	1481	(94.2)	1.14	0.75-1.79	
p-value		0.8						
Area								
Urban	1420	82	(5.8)	1338	(94.2)	1		
Rural	1952	104	(5.3)	1848	(94.7)	0.95	0.71-1.29	
p-value		0.6						
Education level								
None/Preschool	229	12	(5.2)	217	(94.8)	1		**0.007**
Primary	390	17	(4.4)	373	(95.6)	0.82	0.39-1.80	
Lower secondary	405	9	(2.2)	396	(97.8)	0.41	0.17-0.99	
Upper secondary	896	47	(5.2)	849	(94.8)	1.00	0.54-2.00	
Higher	1452	101	(7.0)	1351	(93.0)	1.35	0.76-2.63	
p-value		**<0.001**						
Wealth quintile								
Poorest	84	4	(4.8)	80	(95.2)	1		**0.01**
Second	286	13	(4.5)	273	(95.5)	0.95	0.33-3.45	
Middle	684	30	(4.4)	654	(95.6)	0.92	0.35-3.15	
Fourth	1021	46	(4.5)	975	(95.5)	0.94	0.37-3.19	
Richest	1297	93	(7.2)	1204	(92.8)	1.54	0.62-5.14	
p-value		**0.03**						
Source of ANC								
Govt	1071	59	(5.5)	1012	(94.5)	1		
Pvt	1975	117	(5.9)	1858	(94.1)	1.08	0.78-1.50	
Home/other	326	10	(3.1)	316	(96.9)	0.54	0.26-1.03	
p-value		0.7						
Intention								
Wanted	2739	151	(5.5)	2588	(94.5)	0.99	0.69-1.48	
Unwanted	633	35	(5.5)	598	(94.5)	1		
p-value		0.9						

Using/Ever used CC								
Yes	1707	95	(5.6)	1612	(94.4)	1.02	0.76-1.37	
No	1665	91	(5.5)	1574	(94.5)	1		
p-value		0.9						
No. of ANC visits								
1 to 2	316	20	(6.3)	296	(93.7)	1		0.26
3 to 4	816	30	(3.7)	786	(96.3)	0.56	0.32-1.02	
5 +	2240	136	(6.1)	2104	(93.9)	0.95	0.60-1.60	
p-value		**0.03**						
Parity								
1	941	56	(6.0)	885	(94.0)	1		0.2
2	885	55	(6.2)	830	(93.8)	1.05	0.71-1.53	
3 +	1546	75	(4.9)	1471	(95.1)	0.81	0.57-1.15	
p-value		>0.05						
Media Exposure								
Low	850	43	(5.1)	807	(94.9)	1		0.5
High	2522	143	(5.7)	2379	(94.3)	1.17	0.83-1.68	
p-value		0.7						
Levels of Knowledge								
Low	879	31	(3.5)	848	(96.5)	1		**<0.001**
Moderate	1709	80	(4.7)	1629	(95.3)	1.34	0.89-2.08	
High	784	75	(9.6)	709	(90.4)	2.89	1.90-4.51	
p-value		**<0.001**						
Attitude								
Positive	1416	79	(5.6)	1337	(94.4)	1.02	0.76-1.37	0.9
Negative	1956	107	(5.5)	1849	(94.5)	1		
p-value		>0.07						

The multiple logistic regression was carried out using the significantly associated determinants from the bivariate analysis of determinants that affect HIV testing uptake in Punjabi, Pakistani women and is shown in Table 14. Strongest correlation was seen between high levels of knowledge about HIV and likelihood getting HIV service. On the other hand, lower secondary level of education and belonging to middle economic quintile were associated with less likelihood of getting tested for HIV during pregnancy. As level of education and economic quintiles were very strongly correlated, we carried out 2 separate analysis, 1 with each variable.

Results from other countries were also unique. Tables of results for other countries is given in the annex section. For the Laotian women, being richer ie. belonging to third, fourth and richest quintiles was significantly associated to receiving HIV antenatal coverage. Also, being 30 to 49 years of age, having high knowledge of HIV and receiving antenatal care from a private facility were also associated with getting tested for HIV during pregnancy.

For Kyrgyzstani women, having high knowledge of HIV was strongly associated with receiving HIV and antenatal testing. Other factors that where significantly associated wait antenatal HIV testing were: belonging to rural areas being aged 30 and above and Visiting health care facilities more than five times during pregnancy for antenatal checkup.

Determinants of getting tested for HIV as part of antenatal care in Gambian woman those that were strongly associated were moderate to high HIV awareness and positive attitudes towards PLHIV along with high media exposure. Those that were significantly associated were belonging to age group elder to 25 years, being more educated, having ever used contraceptives. Women giving birth at home were less likely to be tested for HIV. Also women belonging to second economic quintile were less likely to be tested for HIV.

Table 14. Multivariate logistic regression for total HIV coverage among Pakistani women

	Total coverage (Model 1)[1]		Total coverage 2 (Model 2)[2]	
Variable	**aOR**	**95%CI**	**aOR**	**95%CI**
FACTORS				
Education level	-	-		
None/Preschool	-	-	1	
Primary	-	-	0.81	0.38-1.78
Lower secondary *	-	-	0.4	0.15-0.96
Upper secondary	-	-	0.93	0.49-1.89
Higher	-	-	1.14	0.61-2.28
Wealth quintile			-	-
Poorest	1		-	-
Second	0.81	0.38-1.78	-	-
Middle*	0.4	0.15-0.96	-	-
Fourth	0.93	0.49-1.89	-	-
Richest	1.14	0.61-2.28	-	-
Area				
Urban	1		1	
Rural	1.1	0.81-1.5	1.1	0.81-1.5
No. of ANC visits				
1 to 2	1			
3 to 4*	0.48	0.27-0.88	0.48	0.27-0.88
5 +	0.75	0.46-1.29	0.75	0.46-1.29
Levels of Knowledge				
Low	1		1	
Moderate	1.29	0.85-2	1.29	0.85-2
High***	2.722	1.77-4.29	2.72	1.77-4.29

***p=0 : strong correlation
**p=0.001 to 0.01
*p=0.02 to 0.05

[1]Model 1 with wealth

[2]Model 2 with education

aOR: adjusted Odd's ratio.

3.9 Pattern of HIV indicators across surveys

To obtain a clearer picture, we compared major HIV indicators over time across the same survey. The results obtained are shown and illustrated in Table 15. and Figure 6. respectively. However Total HIV coverage could not be assessed in the survey carried out in 2011 as the sample were not questioned about it then. Remaining indicators do show an unusual pattern. 38% of women had at least heard of HIV in 2011 which increased to 43.6% in 2014 but decreased sharply to 24.1% in 2017/18. Similar trend was observed in low-level of knowledge and positive attitudes. Higher HIV related knowledge followed an inverse pattern to low knowledge. Thus, although more people had heard of HIV in 2014, but the level of knowledge they had regarding HIV was inadequate. Proportion of women who have heard of HIV are slightly higher in 2017/18 and more proportion of women have better knowledge, but it has still decreased overall in comparison to 2011. Also, although the coverage does seem to have been improving, but as fewer women have even heard of HIV, testing for HIV is thus not improving in reality.

To find out the reason of abovementioned pattern, we looked into the sociodemographic differences which may be responsible for a contrasting result across the surveys. The results are shown in Table no. 16. As we can see, only the age structure is statistically different depicting and although more rural women are part of the survey who have heard of HIV in 2018, but it is not significant. APC(age-period cohort analysis) could not be carried out in the limited data and survey periods we had thus are recommended for the future when enough data is available.

	MICS-2011	MICS-2014	MICS-2017/18	p-value
Total who received ANC, N	20830	8801	13964	-
Total who heard of HIV, n (%)	7982 (38.3)	3839 (43.6)	3372 (24.1)	**0.04**
Knowledge *				
High, n (%)	3553 (44.5)	480 (12.5)	784 (23.2)	**<0.001**
Moderate, n (%)	3404 (42.6)	1803 (46.7)	1709 (50.7)	0.25
Low, n (%)	1025 (12.8)	1556 (40.5)	879 (26.1)	**0.03**
Attitudes				
Positive, n (%)	5112 (64)	2913 (75.9)	1416 (42)	**0.001**
Negative, n (%)	2870 (36)	926 (24.1)	1956 (58)	**0.001**
Total HIV coverage, n (%)	-	63 (1.6)	155 (4.6)	

Table 15. Major HIV indicators across MICS surveys over time.

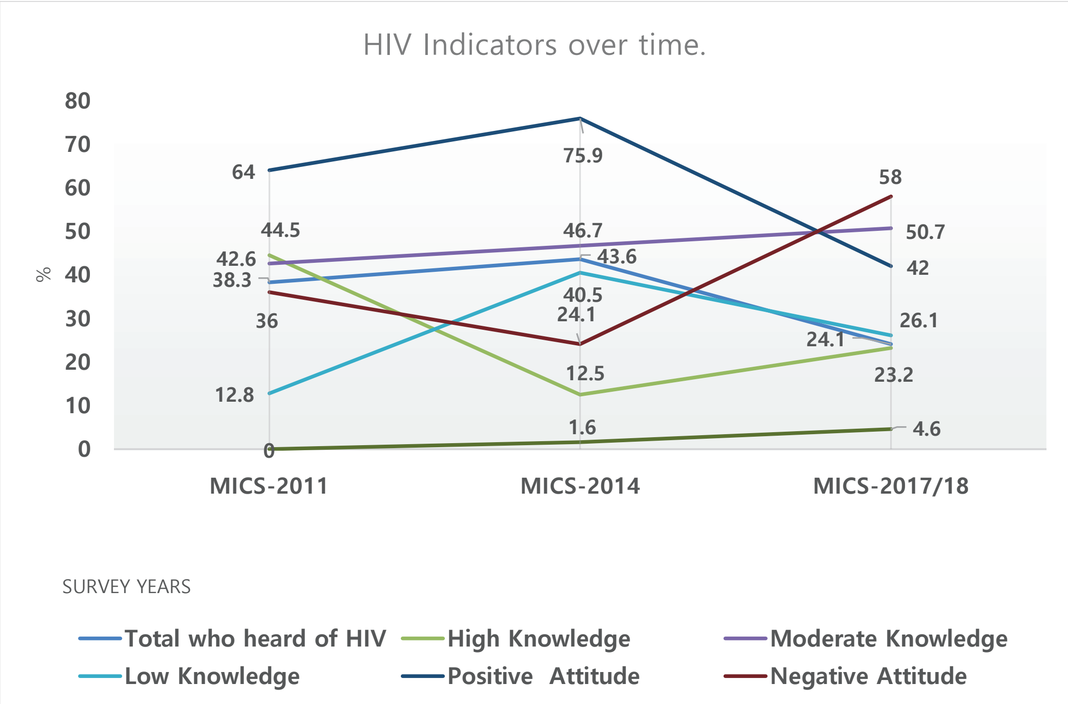

Figure 6. Graphical depiction of HIV indicators across MICS surveys.

Table 16. Distribution of sociodemographic factors in MICS surveys over time.

Variables		Surveys			
		MICS-2011	MICS-2014	MICS-2017/18	p-value
		%	%	%	
Area					
	Rural	44.1	49.66	57.80	
	Urban	55.9	50.34	42.10	0.14
Age					
	15-24	23.1	19.62	16.80	
	25-29	52	38.81	36.50	
	30-49	24.9	41.57	46.60	**0.02**
Education					
	None	9.2	10.98	6.70	
	Primary	15.5	16.73	11.50	
	Middle	14.8	14.57	12.00	
	Secondary	29.3	26.81	26.50	
	Higher	31.2	30.88	43.00	0.72
	Missing	0	0.03	0.00	
Economic Rank					
	Poorest	1.9	3.13	2.40	
	Second	8	10.87	8.40	
	Middle	18.3	20.30	20.20	
	Fourth	31.7	29.91	30.20	
	Richest	40.1	35.79	38.40	0.9

4. DISCUSSION

This is the first study to quantitatively and to some extent, qualitatively investigate potential determinants associated with HIV antenatal testing among women of child-bearing age in Pakistan, where HIV/AIDS is becoming a major public health concern and comparing it to a few other countries. We have demonstrated that there is a strong association between levels of knowledge about HIV and receiving each of the HIV testing services as a part of antenatal care. The results provided us with quantitative relationships among certain factors that determine whether a pregnant woman gets tested for HIV or not. The comparison of HIV indicators across surveys carried out in different points in time reflect clearly failure to raise awareness, HIV related knowledge and testing in the world's 6th largest and fastest growing population of the world. There are many other factors that are qualitative in nature which we will discuss in detail along with the others.

There was a major difference in socioeconomic characteristics of women who had given birth in antenatal care than those who had heard of HIV and received antenatal care. The most striking difference between the two was in Pakistani women followed by Laotian women. However, women from Kyrgyzstan and Gambia had nearly comparable characteristics i.e. there was not much difference between women who received antenatal care and those who had heard of HIV. The major reason for this can be provision of HIV testing as part of antenatal care. Pakistan and Laos do not provide routine HIV testing to pregnant women. On the other hand, Gambia and Kyrgyzstan do[87,88], that is why there is such a major difference in proportion of women actually aware of HIV. It is logical to think that literacy rates among women may also affect awareness regarding existence of such a disease which is a public health concern worldwide. Female literacy rate in Pakistan is 46.5%, in Gambia it is 47.6 %, in Laos it is 72.8 % and in Kyrgyzstan it is 99.4 percent[89]. It can be inferred that majority of Pakistani women had not heard about HIV due to lowest literacy rate among the above countries. However, the case of Laos shall then be odd. But, in countries where prevalence of the disease is slightly higher, the HIV testing is offered as a part of ANC and literacy rate of women is higher, there is a larger proportion of women who have heard of HIV. Other sociodemographic differences are that wealthier Pakistani women had heard more of HIV due to the higher literacy rate of the economically better individuals and this leads to social disparity in HIV testing if it is unavailable to all women as a part of ANC. The same reasons as above are most likely the reason why most Pakistani Punjabi women who have even heard of HIV still have lower knowledge and much negative attitudes towards PLHIV than women of other countries. Some reasons that contribute to much negative attitudes may also be religious and sociocultural make-up of the society. The major religion of the people of Pakistan, Gambia and Kyrgyzstan i.e Islam directs its followers to practice chaste behavior and prohibits sexual intercourse outside realms of marriage. It specifically prohibits adultery, homosexuality, and the use of intoxicants including alcohol and narcotics [(90)]. Then how can the rapid spread of HIV/AIDS in Muslim countries be explained? That is because despite Islamic teachings, some Muslims do engage in activities that lead to them acquiring HIV; these risky practices include illicit drug use and/or premarital or extra marital sex. Men who engage in risky behaviors have the potential of transmitting the disease to their wives. Women, on the other hand, are also directly susceptible; in many Muslim countries, brothels and other forms of sex trade are available despite policies and penalties. The sex workers do not have social support and may be economically disadvantaged and are not screened for sexually transmitted diseases including HIV, thus contributing to the spread of infection. As mentioned before, Injection drug users (IDUs) also are rapidly becoming a population of increasing concern in the transmission of HIV and AIDS, in developing countries, including Muslim countries. Sex- and drug-related behaviors of IDUs can facilitate HIV transmission even when syringes are not directly shared [91-94]. The above context keeps people uninformed and in denial of the growing threat from this otherwise preventable disease, and as it is a taboo, governments fail to recognize it as an issue as well. However, that is not the case in Kyrgyzstan and Gambia, thus the Pakistani government and community should also start recognizing the issue to raise awareness and handle it before it becomes a generalized epidemic. Spread of HIV is not only limited to above practices of the individual, as the dysfunction of Schedule G has been discussed before, similar issues exist within other components of the healthcare system in general. For example: UNAIDS estimates in 2 that only half of the 1.5 million transfusions are actually screened in Pakistan[(95)] which increases not only the likelihood of transmission of HIV, but also other diseases such as HBV and HCV.

The first factor is prevalence of HIV in the country. Pakistan has a low prevalence of HIV which is 0.11%, Laos has a prevalence of 0.3%, Kyrgyzstan has 0.2%, and Gambia has 1.2%, as mentioned earlier. Pakistan's incidence to prevalence ratio of HIV is greater than 13 which indicates —level greater than 10 depicts HIV infections are increasing and large proportions of people living with HIV in these countries do not have access to antiretroviral therapy (HIV treatment). All other countries listed have an incidence to prevalence ratio of less than 10 . Pakistan also has lowest number of people who are aware of their HIV status (only 14% PLHIV know they have HIV) among the compared countries (Laos: 85%, Kyrgyzstan: 68%, Gambia:36) (31,32,37,38). All numbers are far from the 90% UNAIDS target of 2020. Thus, the above situation reflects that a prevalence of 0.2% or more usually may possibly drive upscaling of HIV testing services.

The other major qualitative factor that may affect HIV testing are the finances. Figure 7. gives a summary of HIV financing in selected countries. Despite lowest incidence, Pakistan's spending on HIV is the highest due to the higher crude numbers. Though incidence seems small in percentage (0.11%-160,000 PLHIV), but Pakistan is the 6th largest country by population (220 million in 2018), thus the incidence is translated into higher crude numbers. The government contributed about 36% of total to HIV/AIDS costs and received 63% in assistance from external funding which is lowest among all the listed countries. Despite spending 45.5% on prevention, there are still frequent outbreaks occurring in the general population which warrants attention to increase funding and improving HIV related activities including awareness programs among the key groups and general public as well.

	HIV/AIDS spending (millions of $)	HIV/AIDS spending per prevalent case ($)	Government HIV/AIDS spending as a share of total HIV/AIDS spending (%)	Prepaid private HIV/AIDS spending as a share of total HIV/AIDS spending (%)	Out-of-pocket HIV/AIDS spending as a share of total HIV/AIDS spending (%)	Development assistance for HIV/AIDS spending as a share of total HIV/AIDS spending (%)	Proportion of HIV/AIDS spending on curative care and treatment (%)	Proportion of HIV/AIDS spending on prevention (%)
Kyrgyzstan	51·3 (46·1 to 58·6)	10 026·7 (9022·5 to 11 463·4)	29·7% (23·0 to 37·8)**	0·1% (0·0 to 0·6)†	2·6% (0·3 to 9·4)†	67·6% (58·9 to 74·9)**	20·3% (16·2 to 30·1)†	41·7% (30·5 to 50·3)*
Laos	10·9 (10·2 to 12·3)	1329·4 (1247·5 to 1497·2)	13·5% (8·0 to 23·3)**	0·0% (0·0 to 0·0)†	0·3% (0·2 to 0·5)†	86·2% (76·4 to 91·7)**	24·6% (22·5 to 27·8)†	37·1% (36·0 to 38·2)†
Pakistan	118·5 (108·0 to 135·0)	2619·8 (2388·0 to 2983·7)	36·3% (30·5 to 44·2)**	0·1% (0·0 to 0·2)†	0·4% (0·1 to 1·2)†	63·2% (55·3 to 69·1)**	19·6% (16·6 to 24·7)‡	45·5% (37·7 to 52·8)‡
The Gambia	19·4 (18·7 to 20·5)	939·7 (905·2 to 991·4)	14·5% (11·3 to 19·0)¶	0·1% (0·0 to 0·4)†	0·1% (0·0 to 0·3)†	85·4% (80·9 to 88·6)**	29·5% (27·1 to 32·5)*	32·8% (30·5 to 35·2)*

Source: Spending on health and HIV/AIDS: domestic health spending and development assistance in 188 countries, 1995–2015*

Figure 7. HIV-related spending in countries selected in this study.

Another major determinant can also be the policies and general healthcare setup of a country. Pakistan established National AIDS Control Program in 1986-87 which focused on diagnosis of cases those who visited hospitals, but then slowly transferred focus to community-based services. Since then, the Government of Pakistan in collaboration with the National AIDS Control Program(NACP) and Provincial AIDS Control Programs, UN agencies, bilateral and multilateral donors, and related NGOs(most prominent being Nai Zindagi) and CSOs, including PLHIV representative organizations is working to end the HIV epidemic operating at national, provincial and grass-root levels. Since 2005 under the EHACP (Enhanced HIV and AIDS Control Program) Pakistan has been following an investment approach, programming strategically according to its concentrated epidemic.

The Government's response till date can be divided into four timely phases:

1. From inception to 2003: Focused on identifying cases reporting to healthcare centers.
2. 2003 to 2007: The strategy of EHACP partially decentralized the program to five provincial (PACP) bodies and addressed four principal components: 1) Interventions for most-at-risk populations; 2) Establishment of a Second Generation Surveillance System; 3) Preventing HIV transmission to the General Public through Blood and Blood Products; and 4) Treatment, Care and Support services for PLHIV and Capacity-Building.
3. 2008 to 2010: EHACP continued to be reported over a five-year time frame, till devolution of the Federal MoH (Ministry of Health) in 2011 to provincial levels.
4. Post Devolution 2011 – Present: Provincial AIDS Control Program are following their own provincial strategies. (22)

Despite existence of above programs, reports on targets and outcomes have always lagged behind the targets indicating inefficiency of the programs which can be due to multifold reasons ranging from lack of funding, limited capacities, inefficient systems, lack of political concerns etc.[96]

Some policies regarding Narcotics and drugs need to be discussed as HIV is most common among drug users and they are driving the HIV epidemic in Pakistan as mentioned earlier. Reasons for these include easy accessibility of drugs, and inefficient policies to curb the issue. Due to its large share of the population; Punjab has the highest number of drug users with approximately 260,000 PWID. HIV prevalence among PWID has steadily increased from 10.8% in 2005 to 27.2% in 2011. Many cities in Pakistan reported > 40% prevalence of HIV among PWID, including Faisalabad (52.5%), D.G. Khan (49.6%), Gujrat (46.2%), Karachi (42.2%) and Sargodha (40.6%) with 4 out of the abovementioned cities being located in Punjab. The latest round of Integrated Biologic and Behavioral Surveillance Survey (IBBS) indicated a weighted prevalence of PWID as 36.8% among ten cities of Punjab [97]. Based on a model by Reza et al., the total number of PWID infected with HIV may reach 68,000 by 2020 [98]. A UNODC(UN office of Drugs and Crimes) reported that around 6.7 million drug users can easily access opiates in Pakistan [99-101]. 1.6 million of these misused the prescription opioids for non-medical use [100]. In a NACP conducted survey report it was concluded that the pattern of drug use among PWID from 14 cities of Pakistan included diazepam, promethazine and temazepam [97]. These findings reflect that a sizeable proportion of Pakistani PWID have access to prescription narcotics. According to the Punjab Drug Rules 2007 under section 44 of Drugs Act 1976, around 145 lifesaving and vital medications are stratified into Schedule G. All narcotics and other medications having high potential of drug abuse are included in Schedule G and can only be sold by a licensed pharmacist whereas other drugs can be sold by a non-pharmacist [102]. However, schedule G has been constantly delayed due to protests and by chemists and pharmaceutical companies due to which it's implementation was put off till 2023 [103]. Most salespersons working at medical stores have not even attend college and lack formal education on drug use, combined with continuous relaxation of schedule G is allowing unregulated sale of opiates/narcotics without any need of prescription. Also, most pharmacies in Pakistan are operating unauthorized on bribed drug sale licenses from qualified pharmacists who are physically never present at pharmacies. These pharmacies are run by dispensers who actually have no authority to sell medication. Though this is a considered a crime by Pharmacy Council and Court of Law but practice is widespread in collaboration with corrupt officials of health and related departments [104]. This unchecked malpractice is further allowing sale, availability and accessibility of opiates/narcotics and other controlled substances. The above factors tend to allow the ever-growing proportion of PWID across the nation, thereby increasing risks of HIV in the country. As the focus are women and children, high risk practices along with one-third of PWID reporting to be married put the wives and children being born at high risk.

The risk of women giving birth and newborns being born in situations as discussed above are further put at risk because of the following scenarios. Firstly, HIV testing is not part of antenatal care in Pakistan. Secondly, the literacy rate (males: 69.5%, females:48.5%) is lesser in females followed by only 24 percent of women making up the labor force suffering unequal wages in comparison to men. This socioeconomic disadvantage puts them in a position where the main decision makers of the household are men [(89,105)]. It is further exacerbated by lower use of contraception in married couples as well as among other key populations such as IDU's as shown in Figure 8.

Practices / Behaviors	PWIDs %
Age at first sexual intercourse (mean ± S.D)	19.13 ± 3.9
Never had sexual intercourse	17.8
Sexually active with regular female sex partner	40.3
Condom use at last sex	15.8
Had sex with FSW (last 6 months)	28.3
▪ Mean number of paid female partners (mean ± S.D)(mode)	5.9 ±7.1 (2)
▪ Condom use in last sex with paid female sexual partner	7.7
Had sex with a MSW or TG-SW (last 6 months)	23.6
Condom used in last sex with MSW or TGSW	5.8
Lubricant use in last sex with MSW or TGSW	11.2
Alcohol used during sexual act in past 12 months	17.1
Exchanged/sold blood for drugs or money (last 12 months)	4.8

Source: IBBS (Integrated Biological and Behavioral Survey

Figure 8. Selected sexual behavior patterns among PWID's, Pakistan 2016-2017

For achieving UNAID's target, it is only logical to scale up HIV testing services in order to identify and reach out to those suffering and preventing this virus from spreading. A part of surveillance and identification is HIV antenatal screening. It is the first step towards PMTCT (Prevention of mother to child transmission)/PPTCT (Prevention of parent to child transmission) of HIV. The benefit of this is double pronged which not only informs the person suffering from HIV of her status to initiate treatment, but also greatly reduces chances of transmission of the virus to the newborn. Additionally, a country or region enters the generalized epidemic phase of HIV/AIDS disease if 1% of either the pregnant females, or general population is affected by the virus and HIV antenatal testing can also help identify and inform before this happens through screening and the data collected. However, if HIV services are not scaled up and integrated into existing healthcare systems, the epidemic may even be identified when the burden of the disease is already beyond control, especially when the incidence of the disease is increasing since the past ten years in addition to frequent local outbreaks in rural areas among children and general population and increasing incidence of the disease in high risk groups. Lack of government commitment is another factor which is partly responsible for this issue as a bill has been proposed for HIV testing and rights of PLHIV, but still has not been passed since 2007 except in Capital territory and Sindh province where it was passed in 2013[106.]

Keeping in mind the above scenario and our results that knowledge of HIV/AIDS is the main driver amongst pregnant women to get tested and that if there is a provision of voluntary testing at the healthcare facility, more likely a women is to get tested, we recommend that general awareness and knowledge of HIV along with other STI's are raised. This can most feasibly be done by introducing about safe and sexual health at least in higher secondary schools to improve knowledge among the youth before the onset of sexual practice in addition to outreach programs which focus high risk groups and their spouses, as well as recruitment of media and religious leaders as has been done for eradication of polio[107]. Without this, the general negative attitudes against the virus maybe very difficult to dispel in the otherwise conservative society.

Another important recommendation is to extend the HIV testing to pregnant women in all settings to recognize the trend with collection of data and predict the risk of the epidemic due to HIV and avert it before time. As no/little data is available about the sexual health of Pakistani women and men, we recommend a database be formed which collects data about all sexual diseases/states of at least married individuals. This can later aid to provide epidemiological data of all aspects of sexual health and hence tailored policies and actions and even be used to achieve goals such as elimination of mother to child transmission of HIV and syphilis and so on. Making HIV testing accessible to all pregnant women by integrating it into existing ANC systems can be feasible and cost-effective. At the same time, strengthening the general healthcare system and settings for example: implementation of section G, screening of blood products, monitoring of healthcare settings for quality of infection controls as well as training of all healthcare personnel are a few recommendations that should be look into. When the program is carried out, keeping in mind the conservative nature of the population, conservative language should be used while implementing such programs such as "prevention of vertical transmission of diseases" instead of sexual health or other terms suggesting of it respecting at the same time implementing the programs for a higher acceptance by the population.

Collaboration with other low middle income, and/or Muslim countries who have successfully implemented HIV programs and specifically antenatal HIV testing programs, should be collaborated with for expertise and external evaluation.

Harm reduction programs which have shown to be promising in developed countries such as distribution of needles/syringes among IDU's and condoms to reduce reuse of injections and unprotected sex respectively should be widespread especially, Although Punjab and Sindh provinces have implemented harm reduction programs, the coverage and impact is very minimal, thus it should be upscaled and improved.

The other major recommendation we have is for MICS6 as a request to collect data for seroprevalence of HIV with consent in Punjab and Sindh where the outbreaks occurred this year as the true mother to child transmission cannot be determined accurately from available data sources.

As AIDS is not the only outcome in people infected with HIV, there are many cancers which develop in people with HIV as mentioned earlier. As HIV is recently growing in Pakistan, and cancer is a chronic issue which will surface much later if this issue is not curbed, so the incidence of AIDS defining cancers is still low in Pakistan and no studies have been carried out specifically in this regard. According to GLOBOCAN 2018 statistics, the most common AIDS defining cancer by incidence among the population is cervical cancer(7.3 per 100,000 population), then is non Hodgkin's lymphoma (incidence is 3 per 100,000 population) followed by Hodgkin's lymphoma (0.57 per 100,000). Women with HIV are five times more likely to develop cervical cancer. But if one is unaware of their HIV status combined with ignorance and no knowledge of HPV, Pakistan can soon be fighting both epidemics. Furthermore, HPV(human papilloma virus) screening and vaccination are not practiced at national, subnational level and neither are there any guidelines for healthcare workers to do so for cervical cancer. All HPV testing is opportunistic only. Rest of the AIDS defining cancers appear rarely in the population such as incidence of Kaposi's sarcoma is 0.01%.

The major strengths of our study are: it is a first-population based study that has attempted to explore the total coverage of HIV testing among pregnant women of Punjab, the most populous and high HDI province of the country and attempted to look at the factors related to uptake of the test in an attempt to bring attention to the need of upscaling the response to the rapidly growing epidemic of HIV in the country following 2 major outbreaks in the country within a year, 1 affecting more than 600 children. Reasons and routes of transmission of HIV in these children are being investigated currently. This study has also attempted to compare it with a few other comparable countries to provide a clearer picture of the issue.

The major limitation of our study is that as sexual behaviors are directed by Islam to be confined, discussing them is considered a taboo in the conservative society of Pakistan due to which this questionnaire was not carried out and so could not be assessed as MICS6 as only ever married women in Pakistan were questioned about HIV and AIDS unlike other countries where all women regardless of marital status took part in the sexual behavior survey. However, information about sexual behaviors of key populations was considered (IBBS-2017) to provide an overall relationship and picture of the issue at hand. Secondly, all determinants were not taken into consideration which have otherwise shown to affect in other studies such as woman's occupation, domestic violence or abuse etc.

5.Conclusion

This study highlights the importance of scaling up efforts towards raising awareness and knowledge related to HIV and sexually transmitted diseases and improve HIV screening efforts in order to curb HIV in Pakistan which were alarmingly insufficient and strongly associated to HIV antenatal testing. Our findings, thus, support the need to develop a well-designed educational program about STI’s and HIV not only in key populations, but also in the general population especially women. Also, there is imminent need of improving practice of important intersectoral enactors and stakeholders such as the government, ministry of health, private health care sector, NGO’s and community partners to ensure efficient working without which goals related to 90-90-90 UNAIDS targets and a next generation free of AIDS will be unachievable.

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APPENDIX 1. Parts of Questionnaire used and Descriptive Statistics.

MICS

QUESTIONNAIRE FOR INDIVIDUAL WOMEN
Name and year of survey

YOUR LOGO HERE

WOMAN'S INFORMATION PANEL	**WM**
WM1. *Cluster number:* ___ ___ ___	**WM2**. *Household number:* ___ ___
WM3. *Woman's name and line number:* NAME ________________________ ___ ___	**WM4**. *Supervisor's name and number:* NAME ________________________ ___ ___ ___
WM5. *Interviewer's name and number:* NAME ________________________ ___ ___ ___	**WM6**. *Day / Month / Year of interview:* ___ ___/___ ___/ 2 0 1 ___

Check woman's age in HL6 in LIST OF HOUSEHOLD MEMBERS, HOUSEHOLD QUESTIONNAIRE: If age 15-17, verify in HH33 that adult consent for interview is obtained or not necessary (HL20=90). If consent is needed and not obtained, the interview must not commence and '06' should be recorded in WM17.	**WM7**. *Record the time:* HOURS : MINUTES __ __ : __ __	
WM8. *Check completed questionnaires in this household: Have you or another member of your team interviewed this respondent for another questionnaire?*	YES, INTERVIEWED ALREADY ....1 NO, FIRST INTERVIEW 2	1⇒*WM9B* 2⇒*WM9A*
WM9A. Hello, my name is (***your name***). We are from ***National Statistical Office***. We are conducting a survey about the situation of children, families and households. I would like to talk to you about your health and other topics. This interview usually takes about ***number*** minutes. We are also interviewing mothers about their children. All the information we obtain will remain strictly confidential and anonymous. If you wish not to answer a question or wish to stop the interview, please let me know. May I start now?	**WM9B**. Now I would like to talk to you about your health and other topics in more detail. This interview will take about ***number*** minutes. Again, all the information we obtain will remain strictly confidential and anonymous. If you wish not to answer a question or wish to stop the interview, please let me know. May I start now?	
YES..1 *NO / NOT ASKED*..........................2	1⇒*WOMAN'S BACKGROUND Module* 2⇒*WM17*	

WM17. *Result of woman's interview.* *Discuss any result not completed with Supervisor.*	COMPLETED...01 NOT AT HOME ....02 REFUSED...03 PARTLY COMPLETED ....04 INCAPACITATED (*specify*) ______________ 05 NO ADULT CONSENT FOR RESPONDENT AGE 15-17 ....06 OTHER (*specify*)______________________ 96

WOMAN'S BACKGROUND		WB
WB1. *Check the respondent's line number (WM3) in WOMAN'S INFORMATION PANEL and the respondent to the HOUSEHOLD QUESTIONNAIRE (HH47): Is this respondent also the respondent to the Household Questionnaire?*	YES, RESPONDENT IS THE SAME, WM3=HH47 .... 1 NO, RESPONDENT IS NOT THE SAME, WM3≠HH47 2	2⇒*WB3*
WB2. *Check ED5 in EDUCATION Module in the HOUSEHOLD QUESTIONNAIRE for this respondent: Highest level of school attended:*	ED5=2, 3 OR 4 .... 1 ED5=0, 1, 8 OR BLANK 2	1⇒*WB15* 2⇒*WB14*
WB3. In what month and year were you born?	DATE OF BIRTH MONTH .... __ __ DK MONTH .... 98 YEAR .... __ __ __ __ DK YEAR 9998	
WB4. How old are you? *Probe:* How old were you at your last birthday? *If responses to WB3 and WB4 are inconsistent, probe further and correct. Age must be recorded.*	AGE (IN COMPLETED YEARS) .... __ __	
WB5. Have you ever attended school or any early childhood education programme?	YES .... 1 NO 2	2⇒*WB14*
WB6. What is the highest level and grade or year of school you have attended?	EARLY CHILDHOOD EDUCATION .... 000 PRIMARY .... **1** __ __ LOWER SECONDARY .... **2** __ __ UPPER SECONDARY .... **3** __ __ HIGHER .... **4** __ __	000⇒*WB14*
WB7. Did you complete that (grade/year)?	YES .... 1 NO 2	
WB8. *Check WB4: Age of respondent:*	AGE 15-24 .... 1 AGE 25-49 2	2⇒*WB13*
WB9. At any time during the current school year did you attend school?	YES .... 1 NO 2	2⇒*WB11*
WB10. During this current school year, which level and grade or year are you <u>attending</u>?	PRIMARY .... **1** __ __ LOWER SECONDARY .... **2** __ __ UPPER SECONDARY .... **3** __ __ HIGHER .... **4** __ __	
WB11. At any time during the previous school year did you attend school?	YES .... 1 NO 2	2⇒*WB13*
WB12. During that previous school year, which level and grade or year did you <u>attend</u>?	PRIMARY .... **1** __ __ LOWER SECONDARY .... **2** __ __ UPPER SECONDARY .... **3** __ __ HIGHER .... **4** __ __	
WB13. *Check WB6: Highest level of school attended:*	WB6=2, 3 OR 4 .... 1 WB6=1 2	1⇒*WB15*

MASS MEDIA AND ICT		MT
MT1. Do you read a newspaper or magazine at least once a week, less than once a week or not at all? *If 'At least once a week', probe:* Would you say this happens almost every day? *If 'Yes' record 3, if 'No' record 2.*	NOT AT ALL....0 LESS THAN ONCE A WEEK....1 AT LEAST ONCE A WEEK....2 ALMOST EVERY DAY....3	
MT2. Do you listen to the radio at least once a week, less than once a week or not at all? *If 'At least once a week', probe:* Would you say this happens almost every day? *If 'Yes' record 3, if 'No' record 2.*	NOT AT ALL....0 LESS THAN ONCE A WEEK....1 AT LEAST ONCE A WEEK....2 ALMOST EVERY DAY....3	
MT3. Do you watch television at least once a week, less than once a week or not at all? *If 'At least once a week', probe:* Would you say this happens almost every day? *If 'Yes' record 3, if 'No' record 2.*	NOT AT ALL....0 LESS THAN ONCE A WEEK....1 AT LEAST ONCE A WEEK....2 ALMOST EVERY DAY....3	
CM11. *Sum answers to CM3, CM4, CM6, CM7, CM9 and CM10.*	SUM .... __ __	
CM12. Just to make sure that I have this right, you have had in total (***total number in CM11***) births during your life. Is this correct?	YES ....1 NO 2	1⇨*CM14*
CM13. *Check responses to CM1-CM10 and make corrections as necessary until response in CM12 is 'Yes'.*		
CM14. *Check CM11: How many live births?*	NO LIVE BIRTHS, CM11=00....0 ONE OR MORE LIVE BIRTH, CM11=01 OR MORE....1	0⇨*End*

DESIRE FOR LAST BIRTH		**DB**
DB1. *Check CM17: Was there a live birth in the last 2 years?* *Copy name of last birth listed in the birth history (CM18) to here and use where indicated:* *Name* ______________________________	YES, CM17=1 .... 1 NO, CM17=0 OR BLANK 2	 2⇨*End*
DB2. When you got pregnant with (***name***), did you want to get pregnant at that time?	YES.. 1 NO.. 2	1⇨*End*
DB3. *Check CM11: Number of births:*	ONLY 1 BIRTH .... 1 2 OR MORE BIRTHS 2	1⇨*DB4A* 2⇨*DB4B*
DB4A. Did you want to have a baby later on, or did you not want any children? **DB4B**. Did you want to have a baby later on, or did you not want any more children?	LATER.. 1 NO MORE / NONE 2	

MATERNAL AND NEWBORN HEALTH		MN
MN1. *Check CM17: Was there a live birth in the last 2 years?* *Copy name of last birth listed in the birth history (CM18) to here and use where indicated:* *Name* ________________________________	YES, CM17=1 .... 1 NO, CM17=0 OR BLANK 2	 2⇨*End*
MN2. Did you see anyone for antenatal care during your pregnancy with (***name***)?	YES .... 1 NO 2	 2⇨*MN7*
MN4. How many weeks or months pregnant were you when you first received antenatal care for this pregnancy? *Record the answer as stated by respondent. If "9 months" or later, record 9.*	WEEKS .... **1** __ __ MONTHS .... **2** _0_ __ DK 998	
MN5. How many times did you receive antenatal care during this pregnancy? *Probe to identify the number of times antenatal care was received. If a range is given, record the minimum number of times antenatal care received.*	NUMBER OF TIMES .... __ __ DK 98	

MN20. Where did you give birth to (***name***)? *Probe to identify the type of place.* *<u>If unable to determine whether public or private</u>, write the name of the place and then temporarily record '76' until you learn the appropriate category for the response.* ________________________________ *(Name of place)*	**HOME** RESPONDENT'S HOME........................ 11 OTHER HOME.. 12 **PUBLIC MEDICAL SECTOR** GOVERNMENT HOSPITAL.................. 21 GOVERNMENT CLINIC / HEALTH CENTRE .... 22 GOVERNMENT HEALTH POST .... 23 OTHER PUBLIC (*specify*)___________ 26 **PRIVATE MEDICAL SECTOR** PRIVATE HOSPITAL............................. 31 PRIVATE CLINIC................................... 32 PRIVATE MATERNITY HOME............ 33 OTHER PRIVATE MEDICAL (*specify*) ________________________ 36 DK PUBLIC OR PRIVATE .... 76 OTHER (*specify*)____________________ 96	11⇨*MN23* 12⇨*MN23* 96⇨*MN23*

HIV/AIDS		**HA**
HA1. Now I would like to talk with you about something else. Have you ever heard of HIV or AIDS?	YES....................1 NO 2	 2⇨*End*
HA2. HIV is the virus that can lead to AIDS. Can people reduce their chance of getting HIV by having just one uninfected sex partner who has no other sex partners?	YES....................1 NO ....2 DK 8	
HA3. Can people get HIV from mosquito bites?	YES....................1 NO ....2 DK 8	
HA4. Can people reduce their chance of getting HIV by using a condom every time they have sex?	YES....................1 NO ....2 DK 8	
HA5. Can people get HIV by sharing food with a person who has HIV?	YES....................1 NO ....2 DK 8	
HA6. Can people get HIV because of witchcraft or other supernatural means?	YES....................1 NO ....2 DK 8	
HA7. Is it possible for a healthy-looking person to have HIV?	YES....................1 NO ....2 DK 8	
HA8. Can HIV be transmitted from a mother to her baby: [A] During pregnancy? [B] During delivery? [C] By breastfeeding?	YES NO DK DURING PREGNANCY ....1 2 ....8 DURING DELIVERY ....1 2 ....8 BY BREASTFEEDING 1 2 8	
HA9. *Check HA8[A], [B] and [C]: At least one 'Yes' recorded?*	YES....................1 NO 2	 2⇨*HA11*

HA10. Are there any special drugs that a doctor or a nurse can give to a woman infected with HIV to reduce the risk of transmission to the baby?	YES....1 NO....2 DK....8	
HA11. *Check CM17: Was there a live birth in the last 2 years?* *Copy name of last birth listed in the birth history (CM18) to here and use where indicated:* *Name* ______________________________	YES, CM17=1....1 NO, CM17=0 OR BLANK....2	2⇨*HA24*
HA12. *Check MN2: Was antenatal care received?*	YES, MN2=1....1 NO, MN2=2....2	2⇨*HA17*
HA13. During any of the antenatal visits for your pregnancy with (***name***), were you given any information about: [A] Babies getting HIV from their mother? [B] Things that you can do to prevent getting HIV? [C] Getting tested for HIV? Were you: [D] Offered a test for HIV?	YES NO DK HIV FROM MOTHER....1 2 8 THINGS TO DO....1 2 8 TESTED FOR HIV....1 2 8 OFFERED A TEST FOR HIV....1 2 8	
HA14. I don't want to know the results, but were you tested for HIV as part of your antenatal care?	YES....1 NO....2 DK....8	2⇨*HA17* 8⇨*HA17*
HA15. I don't want to know the results, but did you get the results of the test?	YES....1 NO....2 DK....8	2⇨*HA17* 8⇨*HA17*
HA16. After you received the result, were you given any health information or counselling related to HIV?	YES....1 NO....2 DK....8	
HA17. *Check MN20: Was the child delivered in a health facility?*	YES, MN20=21-36 OR 76....1 NO, MN20=11-12 OR 96....2	2⇨*HA21*
HA18. Between the time you went for delivery but before the baby was born were you offered an HIV test?	YES....1 NO....2	

HA19. I don't want to know the results, but were you tested for HIV at that time?	YES.....1 NO.....2	 2⇨*HA21*
HA20. I don't want to know the results, but did you get the results of the test?	YES.....1 NO.....2	1⇨*HA22* 2⇨*HA22*
HA21. *Check HA14: Was the respondent tested for HIV as part of antenatal care?*	YES, HA14=1.....1 NO OR NO ANSWER, HA14≠1.....2	 2⇨*HA24*
HA22. Have you been tested for HIV since that time you were tested during your pregnancy?	YES.....1 NO.....2	1⇨*HA25*
HA23. How many months ago was your most recent HIV test?	LESS THAN 12 MONTHS AGO.....1 12-23 MONTHS AGO.....2 2 OR MORE YEARS AGO.....3	1⇨*HA28* 2⇨*HA28* 3⇨*HA28*
HA24. I don't want to know the results, but have you ever been tested for HIV?	YES.....1 NO.....2	 2⇨*HA27*
HA25. How many months ago was your most recent HIV test?	LESS THAN 12 MONTHS AGO.....1 12-23 MONTHS AGO.....2 2 OR MORE YEARS AGO.....3	
HA26. I don't want to know the results, but did you get the results of the test?	YES.....1 NO.....2 DK.....8	1⇨*HA28* 2⇨*HA28* 8⇨*HA28*
HA27. Do you know of a place where people can go to get an HIV test?	YES.....1 NO.....2	
HA28. Have you heard of test kits people can use to test themselves for HIV?	YES.....1 NO.....2	 2⇨*HA30*
HA29. Have you ever tested yourself for HIV using a self-test kit?	YES.....1 NO.....2	
HA30. Would you buy fresh vegetables from a shopkeeper or vendor if you knew that this person had HIV?	YES.....1 NO.....2 DK / NOT SURE / DEPENDS.....8	
HA31. Do you think children living with HIV should be allowed to attend school with children who do not have HIV?	YES.....1 NO.....2 DK / NOT SURE / DEPENDS.....8	
HA32. Do you think people hesitate to take an HIV test because they are afraid of how other people will react if the test result is positive for HIV?	YES.....1 NO.....2 DK / NOT SURE / DEPENDS.....8	

HA33. Do people talk badly about people living with HIV, or who are thought to be living with HIV?	YES....1 NO....2 DK / NOT SURE / DEPENDS....8	
HA34. Do people living with HIV, or thought to be living with HIV, lose the respect of other people?	YES....1 NO....2 DK / NOT SURE / DEPENDS....8	
HA35. Do you agree or disagree with the following statement? I would be ashamed if someone in my family had HIV.	AGREE....1 DISAGREE....2 DK / NOT SURE / DEPENDS....8	
HA36. Do you fear that you could get HIV if you come into contact with the saliva of a person living with HIV?	YES....1 NO....2 SAYS SHE HAS HIV....7 DK / NOT SURE / DEPENDS....8	

Table: Distribution of knowledge about HIV transmission, misconceptions & comprehensive knowledge about transmission & Mother to child transmission (MTC) among Gambian women.

Knowledge on HIV/AIDS transmission, prevention and control		
Question	**Percentage with correct answer (%)**	**Percentage reporting with wrong response or no response (Misconceptions) (%)**
Have you ever heard of HIV/AIDS?	98.25	1.75
Knowledge of route of transmission among who have ever heard of HIV		
1. Can a person get HIV infection from mosquito bites?	45.4	54.6
2. Can a person get HIV infection by sharing a meal with someone who is infected?	54.79	45.21
3. Can people get HIV because of witchcraft or other supernatural means?	77.65	22.35
4. Can a healthy-looking person have HIV infection?	77.03	22.97
Reject 2 most common misconceptions & know a healthy-looking person can be HIV+	47.61	52.39
Knowledge of prevention and control		
1. Can the risk of HIV transmission be reduced by having sex with only one faithful uninfected partner?	94.25	5.75
2. Does condom use reduce risk of HIV transmission?	75.28	24.72
HIV transmission can be prevented by having one faithful partner & using condom every time	73.85	26.15
Knowledge of mother to child transmission (MTC) of HIV.		
1. Can HIV be transmitted from a mother to her baby during pregnancy?	84.89	15.11
2. Can HIV be transmitted from a mother to her baby during delivery?	84.43	15.57
3. Can HIV be transmitted from a mother to her baby by breastfeeding?	81.73	18.27
HIV can be transmitted by at least one of the three means	92.01	7.99
HIV can be transmitted by all three means	73.44	26.56
4. Are there any special drugs that a doctor or nurse can give woman with HIV to reduce risk of transmission to the baby?	68.18	31.82
HIV can be transmitted by at least one of the three means & risk can be reduced by taking special drugs during pregnancy	68.18	31.82
HIV can be transmitted by breastfeeding & risk can be reduced by taking special drugs during pregnancy	60.93	39.07
Do not know any specific means of HIV transmission from mother to child	7.99	92.01

Table: Distribution of knowledge about HIV transmission, misconceptions & comprehensive knowledge about transmission & Mother to child transmission (MTC) among Laotian women.

Knowledge on HIV/AIDS transmission, prevention and control		
Question	**Percentage with correct answer (%)**	**Percentage reporting with wrong response or no response (Misconceptions) (%)**
Have you ever heard of HIV/AIDS?	51.33	48.67
Knowledge of route of transmission among who have ever heard of HIV		
1. Can a person get HIV infection from mosquito bites?	51.29	48.71
2. Can a person get HIV infection by sharing a meal with someone who is infected?	21.68	78.32
3. Can people get HIV because of witchcraft or other supernatural means?	86.49	13.51
4. Can a healthy-looking person have HIV infection?	15.45	84.55
Reject 2 most common misconceptions & know a healthy-looking person can be HIV+	8.72	91.28
Knowledge of prevention and control		
1.Can the risk of HIV transmission be reduced by having sex with only one faithful uninfected partner?	87.35	12.65
2. Does condom use reduce risk of HIV transmission?	81.97	18.03
HIV transmission can be prevented by having one faithful partner & using condom every time	76.1	23.85
Knowledge of mother to child transmission (MTC) of HIV.		
1. Can HIV be transmitted from a mother to her baby during pregnancy?	90.15	9.85
2. Can HIV be transmitted from a mother to her baby during delivery?	82.94	17.06
3. Can HIV be transmitted from a mother to her baby by breastfeeding?	89.18	10.82
HIV can be transmitted by at least one of the three means	95.64	4.54
HIV can be transmitted by all three means	76.43	23.57
4. Are there any special drugs that a doctor or nurse can give woman with HIV to reduce risk of transmission to the baby?	32.94	67.06
HIV can be transmitted by at least one of the three means & risk can be reduced by taking special drugs during pregnancy	32.94	67.06
HIV can be transmitted by breastfeeding & risk can be reduced by taking special drugs during pregnancy	31.49	68.51
Do not know any specific means of HIV transmission from mother to child	100	0

Table: Distribution of knowledge about HIV transmission, misconceptions & comprehensive knowledge about transmission & Mother to c hild transmission (MTC) among Kyrgyzstani women.

Knowledge on HIV/AIDS transmission, prevention and control		
Question	**Percentage with correct a nswer (%)**	**Percentage reporting with wrong response or no response (Misconceptio ns) (%)**
Have you ever heard of HIV/AIDS?	97.18	2.82
Knowledge of route of transmission among who have ever heard of HIV		
1. Can a person get HIV infection from mosquito bites?	60.05	39.95
2. Can a person get HIV infection by sharing a meal with someone who is infected?	75.17	24.83
3. Can people get HIV because of witchcraft or other supernatural means?	59.89	40.11
4. Can a healthy-looking person have HIV infection?	10.7	89.3
Reject 2 most common misconceptions & know a healthy-looking person ca n be HIV+	60.38	39.62
Knowledge of prevention and control		
1. Can the risk of HIV transmission be reduced by having sex with only on e faithful uninfected partner?	87.85	12.15
2. Does condom use reduce risk of HIV transmission?	79.06	20.94
HIV transmission can be prevented by having one faithful partner & using condom every time	72.52	27.48
Knowledge of mother to child transmission (MTC) of HIV.		
1. Can HIV be transmitted from a mother to her baby during pregnancy?	87.78	12.22
2. Can HIV be transmitted from a mother to her baby during delivery?	92.74	7.26
3. Can HIV be transmitted from a mother to her baby by breastfeeding?	90.07	9.93
HIV can be transmitted by at least one of the three means	98.78	1.22
HIV can be transmitted by all three means		
4. Are there any special drugs that a doctor or nurse can give woman with HIV to reduce risk of transmission to the baby?	73.49	26.51
HIV can be transmitted by at least one of the three means & risk can be re duced by taking special drugs during pregnancy	73.49	26.51
HIV can be transmitted by breastfeeding & risk can be reduced by taking s pecial drugs during pregnancy	70.59	29.41
Do not know any specific means of HIV transmission from mother to child	98.85	1.15

Table: Distribution of HIV/AIDS related attitudes among Gambian women who received antenatal care and heard of HIV.

Question	**Yes (%)**	**No (%)**
1. Would you buy fresh vegetables from a shopkeeper or vendor if he/she has HIV from him/her?	22.00	78.00
2. Do you think children living with HIV should be allowed to attend school with children who do not have HIV?	29.18	70.82
3. Do you think people hesitate to take an HIV test because they are afraid of how people will react if it is positive?	84.26	15.74
4. Do you think people talk badly about people living with HIV, or are though t to be living with HIV?	82.56	17.44
5. Do people living with HIV or thought to be living with HIV lose the respe ct of other people?	80.22	19.78
6. Do you agree or disagree with the following statement: I would be ashamed if someone in my family had HIV.	67.77	32.23
7. Do you fear that you could get HIV if you come in contact with saliva of a person living with HIV?	61.78	38.22

Table: Distribution of HIV/AIDS related attitudes among Laotian women who received antenatal care and heard of HIV.

Question	Yes (%)	No (%)
1. Would you buy fresh vegetables from a shopkeeper or vendor if he/she has HIV from him/her?	54.2	45.8
2. Do you think children living with HIV should be allowed to attend school with children who do not have HIV?	64.8	35.2
3. Do you think people hesitate to take an HIV test because they are afraid of how people will react if it is positive?	76.53	23.47
4. Do you think people talk badly about people living with HIV, or are though t to be living with HIV?	58.5	41.5
5. Do people living with HIV or thought to be living with HIV lose the respe ct of other people?	73.04	26.96
6. Do you agree or disagree with the following statement: I would be ashamed if someone in my family had HIV.	26.91	73.09
7. Do you fear that you could get HIV if you come in contact with saliva of a person living with HIV?	71.53	28.47

Table: Distribution of HIV/AIDS related attitudes among Kyrgyzstani women who received antenatal care and heard of HIV.

Question	Yes (%)	No (%)
1. Would you buy fresh vegetables from a shopkeeper or vendor if he/she has HIV from him/her?	32.62	67.38
2. Do you think children living with HIV should be allowed to attend school wi th children who do not have HIV?	47.59	52.41
3. Do you think people hesitate to take an HIV test because they are afraid of how people will react if it is positive?	66.39	33.61
4. Do you think people talk badly about people living with HIV, or are thought to be living with HIV?	64.86	35.14
5. Do people living with HIV or thought to be living with HIV lose the respect of other people?	52.18	47.82
6. Do you agree or disagree with the following statement: I would be ashamed if someone in my family had HIV.	49.81	50.19
7. Do you fear that you could get HIV if you come in contact with saliva of a person living with HIV?	50.42	49.58

APPENDIX 2. BIVARIATE AND MULTIVARIATE LOGISTIC REGRESSION RESULTS

Tables of countries other than Pakistan depicting results of Bi-variate analysis to demonstrate relationship between determinants and component of HIV testing services, followed by tables of results from multiple logistic regression.

KYRGYZSTAN

	N	Counselling (before offering test) (A)		not counselled		OR	95% CI	p for trend
		N	%	N	%			
Total	**1308**	**670**	**51.22%**	**63.8**	**48.78%**			
FACTORS		n	(%)	n	(%)			
Age								
15-24	395	190	(48.1)	205	(51.9)	1		0.23
25-29	418	221	(52.9)	197	(47.1)	1.21	0.92-1.59	
30-49	495	259	(52.3)	236	(47.7)	1.18	0.91-1.54	
p-value		> 0.05						
Area								
Urban	529	247	(46.7)	282	(53.3)	1		
Rural	779	423	(54.3)	356	(45.7)	1.36	1.09-1.69	
p-value		**0.008**						
Education level								
None/Preschool	0	0						
Primary	286	152	(53.1)	134	(46.9)	1		0.86
Lower secondary	135	56	(41.5)	79	(58.5)	0.63	0.41-0.94	
Upper secondary	478	251	(52.5)	227	(47.5)	0.97	0.73-1.31	
Higher	409	211	(51.6)	198	(48.4)	0.94	0.69-1.27	
p-value		> 0.05						
Wealth quintile								
Poorest	271	162	(59.8)	109	(40.2)	1	1	
Second	227	113	(49.8)	114	(50.2)	0.67	0.74-1.55	**0.048**
Middle	258	115	(44.6)	143	(55.4)	0.54	0.84-1.72	
Fourth	338	174	(51.5)	164	(48.5)	0.71	0.79-1.55	
Richest	214	106	(49.5)	108	(50.5)	0.66	0.90-1.94	
p-value		**0.012**						
Source of ANC								
Govt	1284	659	(51.3)	625	(48.7)	1		
Pvt	24	10	(43.5)	14	(56.5)	0.95	0.94-1.17	
Home/other	-	-				-	-	
p-value		> 0.05						
Intention								
Wanted	1269	656	(51.7)	613	(48.3)	1.91	1.00-3.80	

Unwanted	39	14	(35.9)	25	(64.1)	1		
p-value		> 0.05						
Using/Ever used CC								
Yes	435	200	(46.0)	235	(54.0)	0.73	0.58-0.92	
No	873	470	(53.8)	403	(46.2)	1		
p-value		**0.009**						
No. of ANC visits								
1 to 2	22	10	(45.5)	12	(54.5)	1		0.09
3 to 4	111	48	(43.2)	63	(56.8)	0.91	0.36-2.34	
5 +	1175	612	(52.1)	563	(47.9)	1.31	0.56-3.11	
p-value		> 0.05						
Parity								
1	298	152	(51.0)	146	(49.0)	1		**<0.001**
2	342	166	(48.5)	176	(51.5)	0.91	0.66-1.23	
3 +	668	352	(52.7)	316	(47.3)	1.07	0.81-1.41	
p-value		> 0.05						
Media Exposure								
Low	646	319	(49.4)	327	(50.6)	1		
High	662	351	(53.0)	311	(47.0)	0.26	0.01-1.78	
p-value		> 0.05						
Levels of Knowledge								
Low	76	10	(13.2)	66	(86.8)	1		**<0.001**
Moderate	627	330	(52.6)	297	(47.4)	5.23	2.76-10.98	
High	605	380	(62.8)	225	(37.2)	10.95	5.77-23.06	
p-value		**< 0.001**						
Attitude								
Positive	749	380	(50.7)	369	(49.3)	0.9	0.72-1.12	
Negative	559	290	(51.9)	269	(48.1)	1		
p-value		> 0.05						

KYRGYZSTAN

	N	Offered test & tested (B)		not offered nor tested		OR	95% CI	p for trend
		N	%	N	%			
Total	**1308**	**946**	**72.34%**	**362**	**27.66%**			
FACTORS		n	(%)	n	(%)			
Age								
15-24	395	270	(68.4)	125	(31.6)	1		**0.001**
25-29	418	291	(69.6)	127	(30.4)	1.06	0.79-1.43	
30-49	495	385	(77.8)	110	(22.2)	1.62	1.20-2.19	
p-value		**0.002**						
Area								
Urban	529	360	(68.1)	169	(31.9)	1		
Rural	779	345	(44.3)	434	(55.7)	1.43	1.12-1.82	
p-value		**< 0.001**						
Education level								
None/Preschool	0	0						
Primary	286	200	(69.9)	86	(30.1)	1		0.08
Lower secondary	135	91	(67.4)	44	(32.6)	0.89	0.57-1.39	
Upper secondary	478	348	(72.8)	130	(27.2)	1.15	0.83-1.59	
Higher	409	307	(75.1)	102	(24.9)	1.29	0.93-1.81	
p-value		> 0.05						
Wealth quintile								
Poorest	271	188	(69.4)	83	(30.6)	1		0.62
Second	227	165	(72.7)	62	(27.3)	1.17	0.80-1.74	
Middle	258	196	(76.0)	62	(24.0)	1.4	0.95-2.06	
Fourth	338	244	(72.2)	94	(27.8)	1.15	0.81-1.63	
Richest	214	153	(71.5)	61	(28.5)	1.11	0.75-1.64	
p-value		> 0.05						
Source of ANC								
Govt	1284	936	(72.9)	348	(27.1)	1		
Pvt	24	11	(43.5)	13	(56.5)	0.82	0.34-2.15	
Home/other	-	-				-	-	
p-value		**0.004**						

Intention								
Wanted	1269	919	(72.4)	350	(27.6)	1.17	0.56-2.28	
Unwanted	39	27	(69.2)	12	(30.8)	1		
p-value		> 0.05						
Using/Ever used CC								
Yes	435	316	(72.6)	119	(27.4)	1.02	0.79-1.33	
No	873	630	(72.2)	243	(27.8)	1		
p-value		> 0.05						
No. of ANC visits								
1 to 2	22	14	(63.6)	8	(36.4)	1		0.13
3 to 4	111	75	(67.6)	36	(32.4)	1.19	0.44-3.04	
5 +	1175	857	(72.9)	318	(27.1)	1.54	0.61-3.63	
p-value		> 0.05						
Parity								
1	298	204	(68.5)	94	(31.5)	1		**0.026**
2	342	242	(70.8)	100	(29.2)	1.12	0.79-1.56	
3 +	668	500	(74.9)	168	(25.1)	1.37	1.01-1.85	
p-value		> 0.05						
Media Exposure								
Low	646	434	(67.2)	212	(32.8)	1		
High	662	512	(77.3)	150	(22.7)	1.75	0.23-10.58	
p-value		**< 0.001**						
Levels of Knowledge								
Low	76	43	(56.6)	33	(43.4)	1		**<0.001**
Moderate	627	400	(63.8)	227	(36.2)	1.31	0.80-2.12	
High	605	503	(83.1)	102	(16.9)	3.66	2.20-6.06	
p-value		**< 0.001**						
Attitude								
Positive	749	503	(67.2)	246	(32.8)	0.95	0.75-1.22	
Negative	559	443	(79.2)	116	(20.8)	1		
p-value		> 0.05						

KYRGYZSTAN

	N	(B) + received results (C)		not (B) nor received results		OR	95% CI	p for trend
		N	%	N	%			
Total	**1308**	**929**	**71.02%**	**379**	**28.98%**			
FACTORS		n	(%)	n	(%)			
Age								
15-24	395	261	(66.1)	134	(33.9)	1		**0.001**
25-29	418	288	(68.9)	130	(31.1)	1.14	0.85-1.53	
30-49	495	380	(76.8)	115	(23.2)	1.7	1.26-2.28	
p-value		**0.001**						
Area								
Urban	529	357	(67.5)	172	(32.5)	1		
Rural	779	572	(73.4)	207	(26.6)	1.42	1.12-1.82	
p-value		**0.02**						
Education level								
None/Preschool	0	0	(0.0)	0	(100.0)			
Primary	286	199	(69.6)	87	(30.4)	1		0.2
Lower secondary	135	89	(65.9)	46	(34.1)	0.85	0.55-1.31	
Upper secondary	478	342	(71.5)	136	(28.5)	1.01	0.79-1.51	
Higher	409	299	(73.1)	110	(26.9)	1.19	0.85-1.66	
p-value		> 0.05						
Wealth quintile								
Poorest	271	184	(67.9)	87	(32.1)	1		0.48
Second	227	162	(71.4)	65	(28.6)	1.18	0.80-1.73	
Middle	258	192	(74.4)	66	(25.6)	1.38	0.94-2.01	
Fourth	338	238	(70.4)	100	(29.6)	1.13	0.80-1.59	
Richest	214	153	(71.5)	61	(28.5)	1.19	0.80-1.76	
p-value		> 0.05						
Source of ANC								
Govt	1284	918	(71.5)	366	(28.5)	1		
Pvt	24	11	(43.5)	13	(56.5)	0.87	0.36-2.29	
Home/other	-	-				-	-	
p-value		**0.007**						

Intention									
Wanted	1269		902	(71.1)	367	(28.9)	1.09	0.52-2.13	
Unwanted	39		27	(69.2)	12	(30.8)	1		
p-value		> 0.05							
Using/Ever used CC									
Yes	435		305	(70.1)	130	(29.9)	0.94		
No	873		624	(71.5)	249	(28.5)	1		
p-value		> 0.05							
No. of ANC visits									
1 to 2	22		14	(63.6)	8	(36.4)	1		0.23
3 to 4	111		75	(67.6)	36	(32.4)	1.14	0.42-2.92	
5 +	1175		841	(71.6)	334	(28.4)	1.44	0.57-3.39	
p-value		> 0.05							
Parity									
1	298		200	(67.1)	98	(32.9)	1		**0.019**
2	342		235	(68.7)	107	(31.3)	1.08	0.77-1.50	
3 +	668		494	(74.0)	174	(26.0)	1.39	1.03-1.87	
p-value		> 0.05							
Media Exposure									
Low	646		424	(65.6)	222	(34.4)	1		
High	662		505	(76.3)	157	(23.7)	1.64	0.22-9.92	
p-value		**< 0.001**							
Levels of Knowledge									
Low	76		42	(55.3)	34	(44.7)	1		**< 0.001**
Moderate	627		391	(62.4)	236	(37.6)	1.3	0.80-2.10	
High	605		496	(82.0)	109	(18.0)	3.57	2.15-5.88	
p-value		**< 0.001**							
Attitude									
Positive	749		496	(66.2)	253	(33.8)	0.97	0.76-1.23	
Negative	559		433	(77.5)	126	(22.5)	1		
p-value		> 0.05							

KYRGYZSTAN

	N	B+C+ postest counselling (D)		B+C+ postest counselling not done		OR	95% CI	p for trend
		N	%	N	%			
Total	**1308**	**879**	**######**	**4.29**	**32.80%**			
FACTORS		n	(%)	n	(%)			
Age								
15-24	395	246	(62.3)	149	(37.7)	1		**0.001**
25-29	418	275	(65.8)	143	(34.2)	1.16	0.87-1.55	
30-49	495	358	(72.3)	137	(27.7)	1.58	1.19-2.10	
p-value		**0.005**						
Area								
Urban	529	342	(64.7)	187	(35.3)	1		
Rural	779	537	(68.9)	242	(31.1)	1.21	0.96-1.53	
p-value		> 0.05						
Education level								
None/Preschool	0	0	(0.0)	0	(100.0)			
Primary	286	187	(65.4)	99	(34.6)	1		0.08
Lower secondary	135	83	(61.5)	52	(38.5)	0.85	0.55-1.29	
Upper secondary	478	319	(66.7)	159	(33.3)	1.06	0.78-1.45	
Higher	409	290	(70.9)	119	(29.1)	1.29	0.93-1.78	
p-value		> 0.05						
Wealth quintile								
Poorest	271	175	(64.6)	96	(35.4)	1		0.2
Second	227	150	(66.1)	77	(33.9)	1.07	0.74-1.55	
Middle	258	177	(68.6)	81	(31.4)	1.2	0.83-1.72	
Fourth	338	226	(66.9)	112	(33.1)	1.11	0.79-1.55	
Richest	214	151	(70.6)	63	(29.4)	1.31	0.90-1.94	
p-value		> 0.05						
Source of ANC								
Govt	1284	868	(67.6)	416	(32.4)	1		
Pvt	24	11	(43.5)	13	(56.5)	1.05	0.44-2.76	
Home/other	-	-						
p-value		**0.03**						

Intention								
Wanted	1269	855	(67.4)	414	(32.6)	1.29	0.66-2.46	
Unwanted	39	24	(61.5)	15	(38.5)	1		
p-value		> 0.05						
Using/Ever used CC								
Yes	435	291	(66.9)	144	(33.1)	0.98	0.77-1.25	
No	873	588	(67.4)	285	(32.6)	1		
p-value		> 0.05						
No. of ANC visits								
1 to 2	22	11	(50.0)	11	(50.0)	1		**0.001**
3 to 4	111	62	(55.9)	49	(44.1)	1.26	0.50-3.19	
5 +	1175	806	(68.6)	369	(31.4)	2.18	0.93-5.14	
p-value		**0.005**						
Parity								
1	298	188	(63.1)	110	(36.9)	1		**0.03**
2	342	225	(65.8)	117	(34.2)	1.13	0.81-1.56	
3 +	668	466	(69.8)	202	(30.2)	1.35	1.01-1.80	
p-value		> 0.05						
Media Exposure								
Low	646	398	(61.6)	248	(38.4)	1		
High	662	481	(72.7)	181	(27.3)	1.37	0.18-8.28	
p-value		**< 0.001**						
Levels of Knowledge								
Low	76	37	(48.7)	39	(51.3)	1		**< 0.001**
Moderate	627	367	(58.5)	260	(41.5)	1.44	0.89-2.34	
High	605	475	(78.5)	130	(21.5)	3.75	2.29-6.14	
p-value		**< 0.001**						
Attitude								
Positive	749	475	(63.4)	274	(36.6)	1.16	0.92-1.45	
Negative	559	404	(72.3)	155	(27.7)	1		
p-value		> 0.05						

KYRGYZSTAN

	N	Total Coverage A+B+C/B+C+D (E)		Not tested		OR	95% CI	p for trend
		N	%	N	%			
Total	**1308**	**879**	**67.20%**		**32.80%**	**-**	**-**	
FACTORS		n	(%)	n	(%)			
Age								
15-24	395	246	(62.3)	149	(37.7)	1		**0.001**
25-29	418	275	(65.8)	143	(34.2)	1.16	0.87-1.55	
30-49	495	358	(72.3)	137	(27.7)	1.58	1.19-2.10	
p-value		**0.005**						
Area								
Urban	529	342	(64.7)	187	(35.3)	1		
Rural	779	537	(68.9)	242	(31.1)	1.21	0.95-1.53	
p-value		> 0.05						
Education level								
None/Preschool	0	0						
Primary	286	187	(65.4)	99	(34.6)	1		0.08
Lower secondary	135	83	(61.5)	52	(38.5)	0.85	0.55-1.29	
Upper secondary	478	319	(66.7)	159	(33.3)	1.06	0.78-1.45	
Higher	409	290	(70.9)	119	(29.1)	1.29	0.93-1.78	
p-value		> 0.05						
Wealth quintile								
Poorest	271	175	(64.6)	96	(35.4)	1		0.2
Second	227	150	(66.1)	77	(33.9)	1.07	0.74-1.55	
Middle	258	177	(68.6)	81	(31.4)	1.2	0.84-1.72	
Fourth	338	226	(66.9)	112	(33.1)	1.11	0.79-1.55	
Richest	214	151	(70.6)	63	(29.4)	1.31	0.90-1.94	
p-value		> 0.05						
Source of ANC								
Govt	1284	868	(67.6)	416	(32.4)	1		
Pvt	24	11	(43.5)	13	(56.5)	1.04	0.44-2.76	
Home/other	-	-				-	-	
p-value		**0.03**						

Intention								
Wanted	1269	855	(67.4)	414	(32.6)	1		
Unwanted	39	24	(61.5)	15	(38.5)	1.29	0.66-2.46	
p-value		> 0.05						
Using/Ever used CC								
Yes	435	291	(66.9)	144	(33.1)	1		
No	873	588	(67.4)	285	(32.6)	0.98	0.76-1.25	
p-value		> 0.05						
No. of ANC visits								
1 to 2	22	11	(50.0)	11	(50.0)	1		**0.001**
3 to 4	111	62	(55.9)	49	(44.1)	1.27	0.50-3.19	
5 +	1175	806	(68.6)	369	(31.4)	2.18	0.93-5.14	
p-value		0.005						
Parity								
1	298	188	(63.1)	110	(36.9)	1		**0.03**
2	342	225	(65.8)	117	(34.2)	1.13	0.81-1.56	
3 +	668	466	(69.8)	202	(30.2)	1.35	1.01-1.80	
p-value		> 0.05						
Media Exposure								
Low	646	398	(61.6)	248	(38.4)	1		
High	662	481	(72.7)	181	(27.3)	1.37	0.18-8.28	
p-value		**< 0.001**						
Levels of Knowledge								
Low	76	37	(48.7)	39	(51.3)	1		**< 0.001**
Moderate	627	367	(58.5)	260	(41.5)	1.44	0.89-2.34	
High	605	475	(78.5)	130	(21.5)	3.744	2.28-6.14	
p-value		**< 0.001**						
Attitude								
Positive	749	475	(63.4)	274	(36.6)	1		
Negative	559	404	(72.3)	155	(27.7)	1.16	0.91-1.46	
p-value		> 0.05						

LAOS

	N	Counselling (before offering test) (A)		Not counselled		OR	95% CI	p for trend
		N	%					
N	1858	325	17.49%	1533	82.51%			
FACTORS		n	(%)	n	(%)			
Age								
15-24	714	89	(12.4)	625	(87.6)	1		**<0.001**
25-29	595	127	(21.3)	468	(78.7)	1.46	1.07-1.99	
30-49	549	109	(19.9)	440	(80.1)	2.26	1.68-3.04	
p-value		**< 0.001**						
Area								
Urban	816	176	(21.6)	640	(78.4)	1		
Rural	1042	149	(14.3)	893	(85.7)	0.61	0.48-0.77	
p-value		**< 0.001**						
Education level								
None/Preschool	73	6	(8.2)	67	(91.8)	1		**< 0.001**
Primary	517	68	(13.2)	449	(86.8)	1.69	0.76-4.50	
Lower secondary	515	76	(14.8)	439	(85.2)	1.93	0.87-5.13	
Upper secondary	286	51	(17.8)	235	(82.2)	2.42	1.07-6.52	
Higher	467	124	(26.6)	343	(73.4)	4.04	1.85-10.63	
p-value		**< 0.001**						
Wealth quintile								
Poorest	162	8	(4.9)	154	(95.1)	1		**< 0.001**
Second	301	12	(4.0)	289	(96.0)	0.8	0.32-2.08	
Middle	408	49	(12.0)	359	(88.0)	2.63	1.28-6.12	
Fourth	458	95	(20.7)	363	(79.3)	5.04	2.53-11.50	
Richest	529	161	(30.4)	368	(69.6)	8.42	4.3-19.05	
p-value		**< 0.001**						
Source of ANC								
Govt	1482	281	(19.0)	1201	(81.0)	1		

Pvt	50	24	(48.0)	26	(52.0)	4.27	2.41-7.58	
Home/other	326	20	(6.1)	306	(93.9)	0.26	0.16-0.42	
p-value		**< 0.001**						
Intention								
Wanted	1677	295	(17.6)	1382	(82.4)	1.07	0.72-1.64	
Unwanted	181	30	(16.6)	151	(83.4)	1		
p-value		> 0.05						
Using/Ever used CC								
Yes	1046	200	(19.1)	846	(80.9)	1.3	1.02-0.22	
No	812	125	(15.4)	687	(84.6)	1		
p-value		**0.04**						
No. of ANC visits								
1 to 2	140	12	(8.6)	128	(91.4)	1		**< 0.001**
3 to 4	491	54	(11.0)	437	(89.0)	1.32	0.71-2.65	
5 +	1227	259	(21.1)	968	(78.9)	2.85	1.62-5.52	
p-value		**< 0.001**						
Parity								
1	717	149	(20.8)	568	(79.2)	1		**< 0.001**
2	632	104	(16.5)	528	(83.5)	0.75	0.57-0.99	
3 +	509	72	(14.1)	437	(85.9)	0.63	0.46-0.86	
p-value		**0.008**						
Media Exposure								
Low	393	40	(10.2)	353	(89.8)	1		**< 0.001**
High	1464	285	(19.5)	1179	(80.5)	2.13	1.52-3.07	
p-value		**< 0.001**						
Levels of Knowledge								
Low	175	16	(9.1)	159	(90.9)	1		<0.001
Moderate	1276	219	(17.2)	1057	(82.8)	2.06	1.24-3.64	
High	406	90	(22.2)	316	(77.8)	2.85	1.66-5.18	
p-value		**< 0.001**						
Attitude								
Positive	1159	223	(19.2)	936	(80.8)	1.39	1.08-1.81	
Negative	699	102	(14.6)	597	(85.4)	1		
p-value		**0.013**						

LAOS

	N	Offered test & tested (B)		Not Offered test & tested		OR	95% CI	p for trend
		N	%	N	%			
N	1858	464	24.97%	1394.0	75.03%			
FACTORS		n	(%)	n	(%)			
Age								
15-24	714	131	(18.3)	583.0	(81.7)	1		**<0.001**
25-29	595	165	(27.7)	430.0	(72.3)	1.72	1.32-2.22	
30-49	549	168	(30.6)	381.0	(69.4)	1.95	1.50-2.54	
p-value		**< 0.001**						
Area								
Urban	816	280	(34.3)	536.0	(65.7)	1		
Rural	1042	184	(17.7)	858.0	(82.3)	0.41	0.33-0.51	
p-value		**< 0.001**						
Education level								
None/Preschool	73	9	(12.3)	64.0	(87.7)	1		**<0.001**
Primary	517	92	(17.8)	425.0	(82.2)	1.54	0.78-3.42	
Lower secondary	515	93	(18.1)	422.0	(81.9)	1.57	0.79-3.48	
Upper secondary	286	89	(31.1)	197.0	(68.9)	3.21	1.60-7.17	
Higher	467	181	(38.8)	286.0	(61.2)	4.5	2.30-9.90	
p-value		**< 0.001**						
Wealth quintile								
Poorest	162	7	(4.3)	155.0	(95.7)	1		**< 0.001**
Second	301	25	(8.3)	276.0	(91.7)	2.01	0.89-5.122	
Middle	408	60	(14.7)	348.0	(85.3)	3.82	1.82-9.34	
Fourth	458	137	(29.9)	321.0	(70.1)	9.45	4.63-22.74	
Richest	529	235	(44.4)	294.0	(55.6)	17.7	8.76%	
p-value		**< 0.001**						
Source of ANC								
Govt	1482	402	(27.1)	1080.0	(72.9)	1		
Pvt	50	29	(58.0)	21.0	(42.0)	3.71	2.10-6.66	
Home/other	326	33	(10.1)	293.0	(89.9)	0.3	0.20-0.43	
p-value		**< 0.001**						

Intention								
Wanted	1677	424	(25.3)	1253.0	(74.7)	1.18	0.83-1.73	
Unwanted	181	40	(22.1)	141.0	(77.9)	1		
p-value		> 0.05						
Using/Ever used CC								
Yes	1046	282	(27.0)	764.0	(73.0)	1.28	1.03-1.58	
No	812	182	(22.4)	630.0	(77.6)	1		
p-value		**0.03**						
No. of ANC visits								
1 to 2	140	19	(13.6)	121.0	(86.4)	1		**< 0.001**
3 to 4	491	71	(14.5)	420.0	(85.5)	1.08	0.64-1.90	
5 +	1227	374	(30.5)	853.0	(69.5)	2.79	1.74-4.74	
p-value		**< 0.001**						
Parity								
1	717	214	(29.8)	503.0	(70.2)	1		
2	632	156	(24.7)	476.0	(75.3)	0.77	0.60-0.98	
3 +	509	94	(18.5)	415.0	(81.5)	0.53	0.40-0.70	
p-value		**< 0.001**						
Media Exposure								
Low	393	52	(0.1)	341.0	(99.9)	1		< 0.001
High	1464	412	(0.3)	1052.0	(99.7)	2.57	1.89-3.54	
p-value		< 0.001						
Levels of Knowledge								
Low	175	36	(0.2)	139.0	(99.8)	1		0.3
Moderate	1276	322	(0.3)	954.0	(99.7)	1.3	0.89-1.94	
High	406	106	(0.3)	300.0	(99.7)	1.37	0.90-2.13	
p-value		> 0.05						
Attitude								
Positive	1159	304	(0.3)	855.0	(99.7)	1.2	0.96-1.49	
Negative	699	160	(0.2)	539.0	(99.8)	1		
p-value		> 0.05						

LAOS

	N	(B) + received results (C)		Not (B) + received results (C)		OR	95% CI	p for trend
		N	%	N	%			
N	1858	447		1411				
FACTORS		n	%	n	%			
Age								
15-24	714	121	(16.9)	593	(83.1)	1		**< 0.001**
25-29	595	161	(27.1)	434	(72.9)	1.83	1.40-2.39	
30-49	549	165	(30.1)	384	(69.9)	2.09	1.61-2.74	
p-value		**< 0.001**						
Area								
Urban	816	271	(33.2)	545	(66.8)	1		
Rural	1042	176	(16.9)	866	(83.1)	0.41	0.33-0.51	
p-value		< 0.001						
Education level								
None/Preschool	73	9	(12.3)	64	(87.7)	1		**< 0.001**
Primary	517	87	(16.8)	430	(83.2)	1.44	0.72-3.20	
Lower secondary	515	88	(17.1)	427	(82.9)	1.47	0.74--3.26	
Upper secondary	286	87	(30.4)	199	(69.6)	3.11	1.55-6.95	
Higher	467	176	(37.7)	291	(62.3)	4.3	2.19-9.46	
p-value		< 0.001						
Wealth quintile								
Poorest	162	7	(4.3)	155	(95.7)	1		**< 0.001**
Second	301	24	(8.0)	277	(92.0)	1.92	0.85-4.91	
Middle	408	56	(13.7)	352	(86.3)	3.52	1.68-8.64	
Fourth	458	132	(28.8)	326	(71.2)	8.97	4.40-21.58	
Richest	529	228	(43.1)	301	(56.9)	16.8	8.29-40.13	
p-value		**< 0.001**						
Source of ANC								
Govt	1482	387	(26.1)	1095	(73.9)	1		
Pvt	50	29	(58.0)	21	(42.0)	3.91	2.21-7.02	
Home/other	326	31	(9.5)	295	(90.5)	0.3	0.20-0.43	
p-value		**< 0.001**						
Intention								

Wanted	1677	408	(24.3)	1269	(75.7)	1.16	0.81-1.71	
Unwanted	181	39	(21.5)	142	(78.5)	1		
p-value		> 0.05						
Using/Ever used CC								
Yes	1046	272	(26.0)	774	(74.0)	1.28	1.03-1.59	
No	812	175	(21.6)	637	(78.4)	1		
p-value		**0.03**						
No. of ANC visits								
1 to 2	140	18	(12.9)	122	(87.1)	1		**< 0.001**
3 to 4	491	66	(13.4)	425	(86.6)	1.05	0.61-1.89	
5 +	1227	363	(29.6)	864	(70.4)	2.85	1.75-4.89	
p-value		**< 0.001**						
Parity								
1	717	203	(28.3)	514	(71.7)	1		
2	632	154	(24.4)	478	(75.6)	0.82	0.64-1.04	
3 +	509	90	(17.7)	419	(82.3)	0.54	0.41-0.72	
p-value		**< 0.001**						
Media Exposure								
Low	393	50	(12.7)	343	(87.3)	1		< 0.001
High	1464	397	(27.1)	1067	(72.9)	2.55	1.87-3.54	
p-value		**< 0.001**						
Levels of Knowledge								
Low	175	33	(18.9)	142	(81.1)	1		0.08
Moderate	1276	308	(24.1)	968	(75.9)	1.37	0.93-2.07	
High	406	106	(26.1)	300	(73.9)	1.53	1.00-2.40	
p-value		> 0.05						
Attitude								
Positive	1159	296	(25.5)	863	(74.5)	1.24	1.00-1.56	
Negative	699	151	(21.6)	548	(78.4)	1		
p-value		> 0.05						

LAOS

	N	B+C+ postest counselling (D)		Not B+C+ postest counselling (D)		OR	95% CI	p for trend
		N	%	N	%			
N	1858	229	13.58%	1629	86.42%			
FACTORS		n	%	n	%			
Age								
15-24	714	56	(7.8)	658	(92.2)	1		**< 0.001**
25-29	595	83	(13.9)	512	(86.1)	1.91	1.34-2.75	
30-49	549	90	(16.4)	459	(83.6)	2.29	1.61-3.28	
p-value		**< 0.001**						
Area								
Urban	816	136	(16.7)	680	(83.3)	1		
Rural	1042	93	(8.9)	949	(91.1)	0.49	0.37-0.65	
p-value		< 0.001						
Education level								
None/Preschool	73	5	(6.8)	68	(93.2)	1		**< 0.001**
Primary	517	46	(8.9)	471	(91.1)	1.33	0.56-3.93	
Lower secondary	515	37	(7.2)	478	(92.8)	1.05	0.44-3.14	
Upper secondary	286	47	(16.4)	239	(83.6)	2.67	1.12-7.94	
Higher	467	94	(20.1)	373	(79.9)	3.43	1.48-9.99	
p-value		< 0.001						
Wealth quintile								
Poorest	162	4	(2.5)	158	(97.5)	1		**< 0.001**
Second	301	10	(3.3)	291	(96.7)	1.36	0.44-5.01	
Middle	408	28	(6.9)	380	(93.1)	2.91	1.11-9.95	
Fourth	458	70	(15.3)	388	(84.7)	7.13	2.89-23.69	

Richest	529	117	(22.1)	412	(77.9)	11.21	4.62-37	
p-value		**< 0.001**						
Source of ANC								
Govt	1482	195	(13.2)	1287	(86.8)	1		
Pvt	50	19	(38.0)	31	(62.0)	4.05	2.21-7.24	
Home/other	326	15	(4.6)	311	(95.4)	0.32	0.18-0.53	
p-value		**< 0.001**						
Intention								
Wanted	1677	206	(12.3)	1471	(87.7)	0.96	0.61-1.55	
Unwanted	181	23	(12.7)	158	(87.3)	1		
p-value		> 0.05						
Using/Ever used CC								
Yes	1046	147	(14.1)	899	(85.9)	1.46	1.10-1.95	
No	812	82	(10.1)	730	(89.9)	1		
p-value		0.01						
No. of ANC visits								
1 to 2	140	5	(3.6)	135	(96.4)	1		**< 0.001**
3 to 4	491	35	(7.1)	456	(92.9)	2.07	0.87-6.13	
5 +	1227	189	(15.4)	1038	(84.6)	4.92	2.20-14.01	
p-value		**< 0.001**						
Parity								
1	717	95	(13.2)	622	(86.8)	1		0.18
2	632	80	(12.7)	552	(87.3)	0.95	0.69-1.30	
3 +	509	54	(10.6)	455	(89.4)	0.78	0.54-1.10	
p-value		> 0.05						
Media Exposure								
Low	393	26	(6.6)	367	(93.4)	1		**< 0.001**
High	1464	203	(13.9)	1261	(86.1)	2.27	1.51-3.55	
p-value		< 0.001						
Levels of Knowledge								

Low	175	11	(6.3)	164	(93.7)	1		**0.01**
Moderate	1276	159	(12.5)	1117	(87.5)	2.12	1.18-4.23	
High	406	59	(14.5)	347	(85.5)	2.55	1.36-5.24	
p-value		0.02						
Attitude								
Positive	1159	158	(13.6)	1001	(86.4)	1.4	1.04-1.89	
Negative	699	71	(10.2)	628	(89.8)	1		
p-value		**0.03**						

LAOS

	N	Total Coverage		No Coverage		OR	95% CI	p for trend
		A+B+C/B+C+D (E)						
		N	**%**	**N**	**%**			
N	1858	303	16.30%	1555	83.69%			
FACTORS		n	%	n	%			
Age								
15-24	714	78	(10.9)	636	(89.1)	1		**<0.001**
25-29	595	100	(16.8)	495	(83.2)	1.65	1.20-2.28	
30-49	549	125	(22.8)	424	(77.2)	2.39	1.76-3.27	
p-value		**< 0.001**						
Area								
Urban	816	178	(21.8)	638	(78.2)	1		
Rural	1042	125	(12.0)	917	(88.0)	0.49	0.37-0.63	
p-value		**< 0.001**						
Education level								
None/Preschool	73	6	(8.2)	67	(91.8)	1		**< 0.001**
Primary	517	59	(11.4)	458	(88.6)	1.44	0.64-3.84	
Lower secondary	515	61	(11.8)	454	(88.2)	1.5	0.67-4.00	

Upper secondary	286	53	(18.5)	233	(81.5)	2.54	1.12-6.83	
Higher	467	124	(26.6)	343	(73.4)	4.04	1.85-10.63	
p-value		**< 0.001**						
Wealth quintile								
Poorest	162	5	(3.1)	157	(96.9)	1		**< 0.001**
Second	301	11	(3.7)	290	(96.3)	1.19	0.43-3.84	
Middle	408	37	(9.1)	371	(90.9)	3.13	1.32-9.23	
Fourth	458	91	(19.9)	367	(80.1)	7.79	3.43-22.4	
Richest	529	159	(30.1)	370	(69.9)	13.5	6.02-38.5	
p-value		**< 0.001**						
Source of ANC								
Govt	1482	255	(17.2)	1227	(82.8)	1		
Pvt	50	26	(52.0)	24	(48.0)	5.21	2.94-9.28	
Home/other	326	22	(6.7)	304	(93.3)	0.35	0.22-0.54	
p-value		**< 0.001**						
Intention								
Wanted	1677	272	(16.2)	1405	(83.8)	0.93	0.62-1.43	
Unwanted	181	31	(17.1)	150	(82.9)	1		
p-value		> 0.05						
Using/Ever used CC								
Yes	1046	187	(17.9)	859	(82.1)	0.31	1.02-1.67	
No	812	116	(14.3)	696	(85.7)	1		
p-value		**0.04**						
No. of ANC visits								
1 to 2	140	9	(6.4)	131	(93.6)	1		**< 0.001**
3 to 4	491	46	(9.4)	445	(90.6)	1.5	0.75-3.36	
5 +	1227	248	(20.2)	979	(79.8)	3.69	1.96-7.90	
p-value		**< 0.001**						
Parity								
1	717	135	(18.8)	582	(81.2)	1		**< 0.001**
2	632	101	(16.0)	531	(84.0)	0.82	0.61-1.09	
3 +	509	67	(13.2)	442	(86.8)	0.65	0.47-0.89	
p-value		**0.03**						
Media Exposure								

Low	393	37	(9.4)	356	(90.6)	1		
High	1464	266	(18.2)	1198	(81.8)	2.13	1.50-3.11	
p-value		**< 0.001**						
Levels of Knowledge								
Low	175	15	(8.6)	160	(91.4)	1		**< 0.001**
Moderate	1276	209	(16.4)	1067	(83.6)	2.09	1.24-3.76	
High	406	79	(19.5)	327	(80.5)	2.59	1.49-4.81	
p-value		**<0.005**						
Attitude								
Positive	1159	212	(18.3)	947	(81.7)	1.5	1.15-1.96	**0.03**
Negative	699	91	(13.0)	608	(87.0)	1		
p-value		**0.004**						

GAMBIA

	N	**Counselling (before offering test) (A)**		**Not Counselled**		**OR**	**95 % CI**	**p for trend**
		N	**(%)**	**N**	**(%)**			
Total	3705	2157	58.20%	1548	41.78%			
FACTORS		n	(%)	n	(%)			
Age								
15-24	1194	622	(52.1)	572	(47.9)	1		**<0.001**

25-29	974	595	(61.1)	379	(38.9)	1.44	1.22-1.71	
30-49	1537	940	(61.2)	597	(38.8)	1.45	1.24-1.69	
p-value		> 0.05						
Area								
Urban	1380	838	(60.7)	542	(39.3)	1		
Rural	2325	1319	(56.7)	1006	(43.3)	0.85	0.74-0.97	
p-value		**0.02**						
Education level								
None/Preschool	2027	1113	(54.9)	914	(45.1)	1		**< 0.001**
Primary	690	404	(58.6)	286	(41.4)	1.16	0.97-1.38	
Lower secondary	511	314	(61.4)	197	(38.6)	1.31	1.07-1.60	
Upper secondary	329	225	(68.4)	104	(31.6)	1.78	1.39-2.28	
Higher	148	101	(68.2)	47	(31.8)	1.76	1.24-2.54	
p-value		**< 0.001**						
Wealth quintile								
Poorest	1323	771	(58.3)	552	(41.7)	1		0.09
Second	864	504	(58.3)	360	(41.7)	1	0.84-1.19	
Middle	669	344	(51.4)	325	(48.6)	0.76	0.63-0.91	
Fourth	467	288	(61.7)	179	(38.3)	1.15	0.93-1.43	
Richest	382	250	(65.4)	132	(34.6)	1.36	1.07-1.72	
p-value		**< 0.001**						
Source of ANC								
Govt	2694	1621	(60.2)	1073	(39.8)	1		
Pvt	162	88	(54.3)	74	(45.7)	0.79	0.57-1.08	
Home/other	849	448	(52.8)	401	(47.2)	0.73	0.63-0.86	
p-value		**< 0.001**						
Intention								
Wanted	2875	1654	(57.5)	1221	(42.5)	0.88	0.75-1.02	
Unwanted	830	503	(60.6)	327	(39.4)	1		
p-value		> 0.05						
Using/Ever used CC								
Yes	1137	726	(63.9)	411	(36.1)	1.4	1.22-1.62	
No	2568	1431	(55.7)	1137	(44.3)	1		
p-value		**< 0.001**						
No. of ANC visits								

1 to 2	261	123	(47.1)	138	(52.9)	1		**<0.001**
3 to 4	1519	867	(57.1)	652	(42.9)	1.49	1.15-1.94	
5 +	1925	1167	(60.6)	758	(39.4)	1.73	1.33-2.24	
p-value		**< 0.001**						
Parity								
1	705	392	(55.6)	313	(44.4)	1		**0.02**
2	650	358	(55.1)	292	(44.9)	0.98	0.79-1.21	
3 +	2350	1407	(59.9)	943	(40.1)	1.19	1-1.41	
p-value		**0.03**						
Media Exposure								
Low	1307	670	(51.3)	637	(48.7)	1		
High	2398	1487	(62.0)	911	(38.0)	1.55	1.35-1.78	
p-value		**< 0.001**						
Levels of Knowledge								
Low	379	142	(37.5)	237	(62.5)	1		**< 0.001**
Moderate	1990	1127	(56.6)	863	(43.4)	2.18	1.74-2.74	
High	1336	888	(66.5)	448	(33.5)	3.33	2.63-4.24	
p-value		**< 0.001**						
Attitude								
Positive	1805	1158	(64.2)	647	(35.8)	1.61	1.42-1.84	
Negative	1900	999	(52.6)	901	(47.4)	1		
p-value		**< 0.001**						

GAMBIA

	N	**Offered test & tested (B)**		**Not offered test & tested**		**OR**	**95% CI**	**p for trend**
		N	**(%)**	**N**	**(%)**			
Total	3705	2317	62.54%	1388	37.46%			
FACTORS		n	(%)	n	(%)			
Age								
15-24	1194	689	(57.7)	505	(42.3)	1		**<0.001**
25-29	974	629	(64.6)	345	(35.4)	1.34	1.12-1.59	

30-49	1537	999	(65.0)	538	(35.0)	1.36	1.17-1.59	
p-value		**< 0.001**						
Area								
Urban	1380	930	(67.4)	450	(32.6)	1		
Rural	2325	1387	(59.7)	938	(40.3)	0.72	0.62-0.82	
p-value		**< 0.001**						
Education level								
None/Preschool	2027	1169	(57.7)	858	(42.3)	1		**< 0.001**
Primary	690	441	(63.9)	249	(36.1)	1.3	1.09-1.56	
Lower secondary	511	341	(66.7)	170	(33.3)	1.47	1.20-1.81	
Upper secondary	329	247	(75.1)	82	(24.9)	2.21	1.70-2.90	
Higher	148	119	(80.4)	29	(19.6)	3.01	2.02-4.64	
p-value		**< 0.001**						
Wealth quintile								
Poorest	1323	789	(59.6)	534	(40.4)	1		**< 0.001**
Second	864	536	(62.0)	328	(38.0)	1.11	0.93-1.32	
Middle	669	373	(55.8)	296	(44.2)	0.85	0.71-1.02	
Fourth	467	332	(71.1)	135	(28.9)	1.67	1.33-2.10	
Richest	382	287	(75.1)	95	(24.9)	2.05	1.59-2.65	
p-value		**< 0.001**						
Source of ANC								
Govt	2694	1723	(64.0)	971	(36.0)	1		
Pvt	162	115	(71.0)	47	(29.0)	1.38	0.98-1.97	
Home/other	849	479	(56.4)	370	(43.6)	0.73	0.62-0.85	
p-value		**< 0.001**						
Intention								
Wanted	2875	1755	(61.0)	1120	(39.0)	0.75	0.63-0.89	
Unwanted	830	562	(67.7)	268	(32.3)	1		
p-value		**< 0.001**						
Using/Ever used CC								
Yes	1137	783	(68.9)	354	(31.1)	1.49	1.29-1.73	
No	2568	1534	(59.7)	1034	(40.3)	1		
p-value		**< 0.001**						
No. of ANC visits								

1 to 2	261	134	(51.3)	127	(48.7)	1		**0.003**
3 to 4	1519	953	(62.7)	566	(37.3)	1.6	1.22-2.08	
5 +	1925	1230	(63.9)	695	(36.1)	1.68	1.29-2,18	
p-value		**< 0.001**						
Parity								
1	705	422	(59.9)	283	(40.1)	1		0.1
2	650	406	(62.5)	244	(37.5)	1.12	0.90-1.39	
3 +	2350	1489	(63.4)	861	(36.6)	1.16	0.98-1.38	
p-value		> 0.05						
Media Exposure								
Low	1307	739	(56.5)	568	(43.5)	1		
High	2398	1578	(65.8)	820	(34.2)	1.48	1.29-1.70	
p-value		**< 0.001**						
Levels of Knowledge								
Low	379	192	(50.7)	187	(49.3)	1		**< 0.001**
Moderate	1990	1240	(62.3)	750	(37.7)	1.61	1.29-2.01	
High	1336	885	(66.2)	451	(33.8)	1.92	1.52-2.42	
p-value		**< 0.001**						
Attitude								
Positive	1805	1249	(69.2)	556	(30.8)	1.75	1.53-2.00	
Negative	1900	1068	(56.2)	832	(43.8)	1		
p-value		**< 0.001**						

GAMBIA

	N	**(B) + received results (C)**		**not (B) + received results**		**OR**	**95% CI**	**p for trend**
		N	**(%)**	**N**	**(%)**			
Total	3705	2235	60.32%	1470	39.68%			
<u>**FACTORS**</u>		n	(%)	n	(%)			
Age								
15-24	1194	657	(55.0)	537	(45.0)	1		**0.01**
25-29	974	611	(62.7)	363	(37.3)	1.38	1.16-1.64	

30-49	1537	967	(62.9)	570	(37.1)	1.39	1.19-1.62	
p-value		**< 0.001**						
Area								
Urban	1380	907	(65.7)	473	(34.3)	1		
Rural	2325	1328	(57.1)	997	(42.9)	0.69	0.60-0.80	
p-value		**< 0.001**						
Education level								
None/Preschool	2027	1116	(55.1)	911	(44.9)	1		**< 0.001**
Primary	690	432	(62.6)	258	(37.4)	1.37	1.15-1.63	
Lower secondary	511	330	(64.6)	181	(35.4)	1.49	1.22-1.82	
Upper secondary	329	238	(72.3)	91	(27.7)	2.13	1.66-2.77	
Higher	148	119	(80.4)	29	(19.6)	3.35	2.24-5.16	
p-value		**< 0.001**						
Wealth quintile								
Poorest	1323	756	(57.1)	567	(42.9)	1		**< 0.001**
Second	864	517	(59.8)	347	(40.2)	1.12	0.94-1.33	
Middle	669	356	(53.2)	313	(46.8)	0.85	0.71-1.03	
Fourth	467	323	(69.2)	144	(30.8)	1.68	1.35-2.11	
Richest	382	283	(74.1)	99	(25.9)	2.14	1.67-2.77	
p-value		**< 0.001**						
Source of ANC								
Govt	2694	1669	(62.0)	1025	(38.0)	1		
Pvt	162	112	(69.1)	50	(30.9)	1.38	0.98-1.95	
Home/other	849	454	(53.5)	395	(46.5)	0.71	0.60-0.82	
p-value		**< 0.001**						
Intention								
Wanted	2875	1695	(59.0)	1180	(41.0)	0.77	0.65-0.90	
Unwanted	830	540	(65.1)	290	(34.9)	1		
p-value		0.002						
Using/Ever used CC								
Yes	1137	755	(66.4)	382	(33.6)	1.45	1.26-1.68	
No	2568	1480	(57.6)	1088	(42.4)	1		
p-value		**< 0.001**						

No. of ANC visits								
1 to 2	261	128	(49.0)	133	(51.0)	1		**0.006**
3 to 4	1519	924	(60.8)	595	(39.2)	1.61	1.24-2.10	
5 +	1925	1183	(61.5)	742	(38.5)	1.66	1.28-2.14	
p-value		**< 0.001**						
Parity								
1	705	404	(57.3)	301	(42.7)	1		**0.047**
2	650	388	(59.7)	262	(40.3)	1.1	0.89-1.37	
3 +	2350	1443	(61.4)	907	(38.6)	1.19	1-1.41	
p-value		> 0.05						
Media Exposure								
Low	1307	709	(54.2)	598	(45.8)	1		
High	2398	1526	(63.6)	872	(36.4)	1.48	1.29-1.69	
p-value		**< 0.001**						
Levels of Knowledge								
Low	379	186	(49.1)	193	(50.9)	1		**< 0.001**
Moderate	1990	1176	(59.1)	814	(40.9)	1.55	1.24-1.93	
High	1336	858	(64.2)	478	(35.8)	1.87	1.48-2.35	
p-value		**< 0.001**						
Attitude								
Positive	1805	1207	(66.9)	598	(33.1)	1.71	1.50-1.96	
Negative	1900	1028	(54.1)	872	(45.9)	1		
p-value		**< 0.001**						

GAMBIA

	N	**B+C+postest counselling (D)**	**no B+C+postest counselled**	**OR**	**95% CI**	**p for trend**

		N	(%)	N	(%)			
Total	3705	1519	40.99%	2186	59.01			
FACTORS		n	(%)	n	(%)			
Age								
15-24	1194	429	(35.9)	765	(64.1)	1		**<0.001**
25-29	974	410	(42.1)	564	(57.9)	1.3	1.09-1.54	
30-49	1537	680	(44.2)	857	(55.8)	1.41	1.21-1.65	
p-value		**< 0.001**						
Area								
Urban	1380	636	(46.1)	744	(53.9)	1		
Rural	2325	883	(38.0)	1442	(62.0)	0.72	0.63-0.82	
p-value		**< 0.001**						
Education level								
None/Preschool	2027	738	(36.4)	1289	(63.6)	1		**< 0.002**
Primary	690	290	(42.0)	400	(58.0)	1.27	1.06-1.51	
Lower secondary	511	240	(47.0)	271	(53.0)	1.55	1.27-1.88	
Upper secondary	329	166	(50.5)	163	(49.5)	1.78	1.41-2.25	
Higher	148	85	(57.4)	63	(42.6)	2.36	1.68-3.31	
p-value		**< 0.001**						
Wealth quintile								
Poorest	1323	524	(39.6)	799	(60.4)	1		**<0.001**
Second	864	357	(41.3)	507	(58.7)	1.07	0.90-1.28	
Middle	669	211	(31.5)	458	(68.5)	0.7	0.58-0.85	
Fourth	467	224	(48.0)	243	(52.0)	1.41	1.14-1.74	
Richest	382	203	(53.1)	179	(46.9)	1.73	1.38-2.18	
p-value		**< 0.001**						
Source of ANC								
Govt	2694	1138	(42.2)	1556	(57.8)	1		
Pvt	162	74	(45.7)	88	(54.3)	1.15	0.83-1.58	
Home/other	849	307	(36.2)	542	(63.8)	0.78	0.66-0.91	
p-value		**< 0.001**						
Intention								
Wanted	2875	1165	(40.5)	1710	(59.5)	0.91	0.78-1.07	
Unwanted	830	354	(42.7)	476	(57.3)	1		
p-value		> 0.05						

	N	N	(%)	N	(%)	OR	95% CI	p for trend
Using/Ever used CC								
Yes	1137	531	(46.7)	606	(53.3)	1.4	1.22-1.61	
No	2568	988	(38.5)	1580	(61.5)	1		
p-value		**< 0.001**						
No. of ANC visits								
1 to 2	261	81	(31.0)	180	(69.0)	1		**0.04**
3 to 4	1519	636	(41.9)	883	(58.1)	1.6	1.21-2.13	
5 +	1925	802	(41.7)	1123	(58.3)	1.59	1.21-2.10	
p-value		**0.003**						
Parity								
1	705	265	(37.6)	440	(62.4)	1		**0.02**
2	650	261	(40.2)	389	(59.8)	1.11	0.90-1.39	
3 +	2350	993	(42.3)	1357	(57.7)	1.22	1.02-1.45	
p-value		> 0.05						
Media Exposure								
Low	1307	466	(35.7)	841	(64.3)	1		
High	2398	1053	(43.9)	1345	(56.1)	1.41	1.23-1.62	
p-value		**< 0.001**						
Levels of Knowledge								
Low	379	107	(28.2)	272	(71.8)	1		**< 0.001**
Moderate	1990	814	(40.9)	1176	(59.1)	1.76	1.39-2.25	
High	1336	598	(44.8)	738	(55.2)	2.09	1.63-2.69	
p-value		**< 0.001**						
Attitude								
Positive	1805	861	(47.7)	944	(52.3)	1.72	1.51-1.97	
Negative	1900	658	(34.6)	1242	(65.4)	1		
p-value		**< 0.001**						

GAMBIA

	N	**Total Coverage A+B+C/B+C+D (E)**		**not tested**		**OR**	**95% CI**	**p for trend**
		N	**(%)**	**N**	**(%)**			
Total	3705	2007	######	16.98	45.82%			

FACTORS								
Age								
15-24	1194	577	48.32	617	51.68	1		**<0.001**
25-29	974	554	56.88	420	43.12	1.4	1.19-1.67	
30-49	1537	876	56.99	661	43.01	1.42	1.22-1.65	
p-value		**< 0.001**						
Area								
Urban	1380	819	59.35	561	40.65	1		
Rural	2325	1188	51.10	1137	48.90	0.72	0.63-0.82	
p-value		**< 0.001**						
Education level								
None/Preschool	2027	1000	49.33	1027	50.67	1		**<0.001**
Primary	690	383	55.51	307	44.49	1.28	1.08-1.52	
Lower secondary	511	298	58.32	213	41.68	1.44	1.18-1.75	
Upper secondary	329	218	66.26	111	33.74	2.02	1.58-2.58	
Higher	148	108	72.97	40	27.03	2.77	1.93-4.07	
p-value		**< 0.001**						
Wealth quintile								
Poorest	1323	681	51.47	642	48.53	1		**<0.001**
Second	864	468	54.17	396	45.83	1.11	0.94-1.33	
Middle	669	311	46.49	358	53.51	0.82	0.68-0.99	
Fourth	467	291	62.31	176	37.69	1.56	1.26-1.94	
Richest	382	256	67.02	126	32.98	1.91	1.51-2.44	
p-value		**< 0.001**						
Source of ANC								
Govt	2694	1506	55.90	1188	44.10	1		
Pvt	162	99	61.11	63	38.89	1.23	0.90-1.72	
Home/other	849	402	47.35	447	52.65	0.71	0.61-0.83	
p-value		**< 0.001**						
Intention								
Wanted	2875	1530	53.22	1345	46.78	0.84	0.72-0.98	
Unwanted	830	477	57.47	353	42.53	1		
p-value		**0.03**						
Using/Ever used CC								
Yes	1137	692	60.86	445	39.14	1.48	1.29-1.71	

No	2568	1315	51.21	1253	48.79	1		
p-value		**< 0.001**						
No. of ANC visits								
1 to 2	261	113	43.30	148	56.70	1		**0.003**
3 to 4	1519	824	54.25	695	45.75	1.55	1.19-2.03	
5 +	1925	1070	55.58	855	44.42	1.64	1.26-2.13	
p-value		**< 0.001**						
Parity								
1	705	367	52.06	338	47.94	1		0.09
2	650	341	52.46	309	47.54	1.02	0.82-1.26	
3 +	2350	1299	55.28	1051	44.72	1.14	0.96-1.35	
p-value		> 0.05						
Media Exposure								
Low	1307	619	47.36	688	52.64	1		
High	2398	1388	57.88	1010	42.12	1.53	1.33-1.75	
p-value		**< 0.001**						
Levels of Knowledge								
Low	379	146	38.52	233	61.48	1		**< 0.001**
Moderate	1990	1074	53.97	916	46.03	1.87	1.50-2.35	
High	1336	787	58.91	549	41.09	2.29	1.81-2.90	
p-value		**< 0.001**						
Attitude								
Positive	1805	1101	61.00	704	39.00	1.72	1.51-1.96	
Negative	1900	906	47.68	994	52.32	1		
p-value		**< 0.001**						

Results from multiple logistic regression.

Gambia	Total coverage	
Variable	aOR	95%CI
FACTORS		
Age		
15-24	1	
25-29**	1.31	1.07-1.61
30-49**	1.33	1.08-1.63
Area		
Urban	1	
Rural	0.9	0.74-1.1
Education level		
None/Preschool	1	
Primary**	1.3	1.09-1.56
Lower secondary *	1.25	1.01-1.54
Upper secondary ***	1.71	1.31-2.24
Higher**	1.74	1.16-2.64
Wealth quintile		
Poorest	1	
Second**	1.05	0.88-1.26
Middle	0.71	0.57-0.88
Fourth	1.11	0.84-1.47
Richest	1.04	0.75-1.45
Source of ANC		
Govt	1	
Pvt	0.82	0.58-1.17
Home/other*	0.82	0.69-0.96
Intention		
Wanted	0.89	0.76-1.06
Unwanted	1	
Using/Ever used CC		
Yes**	1.24	1.07-1.45
No	1	

No. of ANC visits		
1 to 2	1	
3 to 4**	1.46	1.11-1.92
5 +**	1.54	1.18-2.03
Parity		
1	1	
2	0.96	0.76-1.20
3 +	1.04	0.82-1.30
Media Exposure		
Low	1	
High***	1.31	1.12-1.52
Levels of Knowledge		
Low	1	
Moderate***	1.92	1.52-2.43
High***	2.24	1.76-2.87
Attitude		
Positive***	1.45	1.26-1.67
Negative	1	

Kyrgyzstan	Total coverage		
Variable	aOR	95%CI	
FACTORS			
Age			
15-24	1		
25-29	1.06	0.76-1.48	
30-49**	1.48	1.02-2.16	
Area			
Urban	1		
Rural**	1.3	1.02-1.67	
Source of ANC			
Govt	1		
Pvt	0.96	0.39-2.63	
Home/other	0.74	0.02-19.12	
No. of ANC visits			
1 to 2	1		1
3 to 4	1.42	0.54-3.79	
5 + *	2.29	0.93-5.70	
Parity			
1	1		
2	1.15	0.81-1.64	
3 +	1.16	0.80-1.68	
Media Exposure			
Low	1		1
High	1.24	0.16-7.77	
Levels of Knowledge			
Low	1		
Moderate	1.33	0.81-2.17	
High ***	3.47	2.10-5.74	

Total coverage

Laos

Variable	aOR	95%CI
FACTORS		
Age		
15-24	1	
25-29	1.18	0.82-1.71
30-49**	1.94	1.28-2.93
Area		
Urban	1	
Rural	1.16	0.85-1.57
Education level		
None/Preschool	1	
Primary	1.04	0.42-2.96
Lower secondary	0.822	0.33-2.35
Upper secondary	1.14	0.45-3.32
Higher	1.14	0.46-3.27
Wealth quintile		
Poorest	1	
Second	1.16	0.41-3.77
Middle *	2.7	1.09-8.18
Fourth ***	5.92	2.44-17.8
Richest ***	8.29	3.32-25.3
Source of ANC		
Govt	1	
Private***	4.22	2.28-7.89
Home/other	0.84	0.5-1.37
Using/Ever used CC		
Yes	1	
No	1.17	0.89-1.54
No. of ANC visits		
1 to 2	1	
3 to 4	1.17	0.56-2.71
5 +	1.76	0.89-3.94

Parity		
1	1	
2*	0.68	0.49-0.94
3 +*	0.61	0.39-0.92
Media Exposure		
Low	1	
High	8.57	0.57-13.1
Levels of Knowledge		
Low	1	
Moderate	1.5	0.86-2.78
High*	1.84	1.01-3.53
Attitude		
Positive	1.07	0.80-1.44
Negative	1	

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