University of Rajshahi **Rajshahi-6205** **Bangladesh.**

RUCL Institutional Repository **http://rulrepository.ru.ac.bd**

Department of Population Science and Human Resource Development MPhil Thesis

2013

Knowledge and Consciousness Level of Bangladeshi People about the Infectious Diseases

Noor, Behzad

University of Rajshahi

http://rulrepository.ru.ac.bd/handle/123456789/209

Copyright to the University of Rajshahi. All rights reserved. Downloaded from RUCL Institutional Repository.

Knowledge and Consciousness Level of Bangladeshi People about the Infectious Diseases

M. Phil. Thesis

A Dissertation Submitted for the Fulfillment of the Requirements for the Degree of Master of Philosophy (M. Phil.) under the Department of Population Science and Human Resource Development, University of Rajshahi.

Date of Submission:
June, 2013

Submitted by:
Examination Roll Number: 09305
Registration Number: 0765
Session 2009-2010

Department of Population Science and Human Resource Development
University of Rajshahi
June, 2013.

DEDICATED

To

MY
Beloved
Grand Parents

Acknowledgement

At the outset all praises and utmost gratitude to Almighty Allah, source of all power and knowledge, for giving me strength, patience and ability to accomplish my research work. This research paper is a part of my research work at M. Phil. level whole heartedly I have tried my best to bring out good research work with all my sincerity, honesty, merit and hard labor.

This research work has been completed and made possible only through the sympathetic help enthusiastic assistance and proper guidance, given so logically and systematically by honorable supervisor Dr. J.A.M Shoquilur Rahman, Professor, Department of Population Science and Human Resource Development, University of Rajshahi and co-supervisor Dr. Nazrul Hoque, Ph.D. Associate, Director for, Estimate and Projections, Faculty Research Associate, the University of Texas at San-Antonio Texas. Their wise and valuable advices have been assisted me as the guideline throughout the preparation of this paper. I am grateful for their effort in showing my silly mistakes, and helping me to correct these. Thanks my honorable supervisors. Their active and encouraging inspiration has been acted the basis of completing this paper so successfully.

Also cordial thanks to all the teachers and the staff of computer unit of our Department, University of Rajshahi for their mindful assistance in doing my M. Phil research. Finally, I would like to thankful to my little sweet daughter for creating the source of inspiration of making something especial for her and my wife for her heartfelt supports and encouragement.

Lastly, I am grateful to my family members, especially to my beloved grand father & parents for their continuous inspiration throughout the whole period of my study life.

March, 2013 *The Author*

Abstract

Transmission of an infectious disease may occur through one or more diverse pathways including physical contact with infected individuals. These infected agents may also be transmitted through liquids, foods, body fluids, contaminated objects, airborne inhalation, or through vector borne spread. The term infectivity describes the ability of an organism to enter, survive and multiply in the host, while the infectiousness of a disease indicate the comparative ease with which the disease is transmitted to other hosts. Tweaking the lifestyle could be a big step for the people suffering from different infectious diseases toward the prevention of different infectious diseases- and it's never too late to start. To do so, as initial step, it is more than indispensable for every one to get closer to all the factors involving in the prevalence of these pandemics in the proximity of time to get ready for fighting in the war with the pandemic. This study has done to investigate the differential levels and risky factors of socio-demographic and health related concerned affecting the vulnerability of the people to the infectious diseases. Different statistical analysis named logistic regression, linear probability mode (LPM) have been employed to investigate the differential patterns of the selected infectious diseases (i.e., Hepatitis B and HIV/AIDS), to identify the interaction effects of the factors which influence knowledge and consciousness of the studied population. For this purpose data had been collected from Bangladesh Demographic and Health Survey (BDHS), 2007. The present study utilizes the BDHS with having a sample of 3151. From the study it has been found that in the case of hepatitis B the majority of middle aged people (41-50 years of age group) have the habit of taking the vaccination regarding HB, on the other hand for HIV/AIDS the majority of the respondents of age group 21-30 used to use the condom as their security measure. Educational attainment and access to multimedia have the significant contribution to explore the knowledge and consciousness regarding these pandemics. It can be mentioned that with 10% enhancement in the respondent's educational attainment and 10% enhancement in the habit of watching TV make the consciousness level higher by 1.26%. With the habit of taking protected drinking water and with the higher educational enrollment the consciousness level about HB and HIV/AIDS is enhanced respectively. It can be mentioned that with 10 percent

enhancement in the respondent's habit of taking protected water, the habit of taking HB vaccine is also increased by 1.36 percent. It has also been found that respondent's income, habit of watching TV and educational attainment play vital role in explaining the habit of taking the protected drinking water as with 10 percent enhancement of respondent's income the probability of taking protected drinking water and the habit of using condom is increased by 1.17 percent and 1.89 percent respectively. From the above discussion it can be concluded that the respondents of our study who have the sound educational enrollment as well as who have the higher economic status are more informative as they have the access to different print media, electronic media, internet and some other sources of information through which they can be more informative. So, it can be stated that the GOs' and NGOs' implacable contribution in exploring varieties of information to the grassroots people is indispensable to make our large rural based population more aware about the knowledge and consciousness about these two diseases to get rid of the prevalence of these diseases. It is essential to have some data from the aforesaid diseases affected people directly to have the cavernous idea about the reasons of the prevalence so that the replication of the diseases could be prevented.

Declaration

I declare that the thesis entitled **Knowledge and Consciousness Level of Bangladeshi People about the Infectious Diseases** embodies the findings of original research work carried out by myself under the supervision of Dr. J.A.M. Shoquilur Rahman Professor, Department of Population Science and Human Resource Development, University of Rajshahi and Nazrul Hoque, Associate Director for Estimate and Projections, Faculty Research Associate, The University of Texas at San Antonio, Texas. This thesis is submitted to the University of Rajshahi for the Degree of Master of Philosophy in the Department of Population Science and Human Resource Development. No part of this thesis has ever been submitted anywhere for any Degree or Diploma.

.....

Behzad Noor
Population Science and Human Resource Development
Faculty of Science
Registration Number: 0765
Roll Number: 09305
Session: 2009-2010

Certificate

This is to certify that the thesis entitled **Knowledge and Consciousness Level of Bangladeshi People about the Infectious Diseases** is an original research work carried out by Behzad Noor under the supervision of myself and Nazrul Hoque, Associate Director for Estimate and Projections, Faculty Research Associate, The University of Texas at San Antonio, Texas. This work has never been submitted anywhere for any Degree or Diploma. Behzad Noor has fulfilled all terms and conditions for M. Phil. Degree including presentations of the findings of the research work in two seminars held in the Department of Population Science and Human Resource Development, University of Rajshahi.

.....

Dr. J.A.M. Shoquilur Rahman
Professor
Department of Population Science
and Human Resource Development
University of Rajshahi

Certificate

This is to certify that the thesis entitled **Knowledge and Consciousness Level of Bangladeshi People about the Infectious Diseases** is an original research work carried out by Behzad Noor under the supervision of myself as co-supervisor and Dr. J.A.M. Shoquilur Rahman, Professor, Department of Population Science and Human Resource Development, University of Rajshahi as supervisor. This work has never been submitted anywhere for any Degree or Diploma. Behzad Noor has fulfilled all terms and conditions for M. Phil. Degree including presentations of the findings of the research work in two seminars held in the Department of Population Science and Human Resource Development, University of Rajshahi.

.....

Nazrul Hoque
Associate Director for Estimate and Projection
Faculty Research Associate
The University of Texas at San Antonio, Texas

Contents

LIST OF TABLES

Chapter One

Research Perspective

1.1 Background of the Study

Knowledge and consciousness are the most important factors in gaining different diseases oriented information to keep one-self being aware from the pandemic like HIV/AIDS and Hepatitis B1 (HB1). This study has been introduced to have some idea regarding the factors affecting the knowledge and consciousness about the two most intensified diseases (HIV/AIDS & HB1) and to discover the probable way of maintain the safeguard. The basic terminologies are being discussed herewith.

An infectious disease is a clinically evident disease resulting from the presence of pathogenic microbial agents, including pathogenic viruses, pathogenic bacteria, fungi, protozoa, multi-cellular parasites, and aberrant proteins known as prions. These pathogens are able to cause diseases in animals and/or plants. Infectious pathologies are usually qualified as contagious diseases (also called communicable diseases) due to their potentiality of transmission from one person or species to another (American Psychological Association, (2010a)). Transmission of an infectious disease may occur through one or more diverse pathways including physical contact with infected individuals. These infected agents may also be transmitted through liquids, food, body fluids, contaminated objects, airborne inhalation, or through vector borne spread (American Psychological Association, (2010b)). An infection however, is not synonymous or impairs host function. The term infectivity describes the ability of an organism to enter, survive and multiply in the host, while the infectiousness of a disease indicate the comparative ease with which the disease is transmitted to other hosts (Alonso *et al.*, (2011)). Among the almost infinite verities of organisms, relatively

few cause diseases in other healthy individuals (Fauci, (2001)). Infectious diseases results from interplay between those few pathogens and the defense of the hosts they infect. The appearance and severity of diseases resulting from any pathogens depends upon the ability of that pathogen to damage the host as well as the ability of the host to resist the pathogen. Primary pathogens may also cause more severe disease in a host with depressed resistance than would normally occur in an immunosufficient host (American Psychological Association, (2012)).

Epidemiology is another important tool used to study disease in a population. For infectious diseases it helps to determine if a disease outbreak is sporadic (occasional occurrence), endemic (regular case often occurring in a region), epidemic (An usually high number of cases in a region), or pandemic (a global epidemic) (Ponticiello *et al.*, (2010)).

The classification of transmission of infectious diseases is usually the most important for epidemiological investigations. Knowledge of means of transmission and natural reservoir assists in developing strategies for limiting transmission. Keep in mind that some diseases can be spread by more than one means (Centers for Disease Control and Prevention, (2010)).

Table 1.1.1: Means of Transmission

Means of Transmission	
Contact	**Requires direct or indirect contact (fomite, blood, or body fluid)**
Food or Water	**Ingestion of contaminated food or water**
Airborne	**Inhalation of contaminated air**
Vector-borne	**Dependent on biology of vector as well as infectivity of organism**
Parasitic	**Similar to contact infection, however, the contact may occur in utero or during delivery.**

Source: WHO Fact File, 2011

The incubation period is defined as the time between exposure to the onset of symptoms or other signs of infection. Diseases have incubation periods that vary widely (Taylor *et al.*, (2001)).

Incubation Period

- **Time between exposure and onset of symptoms or signs of infection.**
- **Each disease has typical incubation period but varies widely**
- **Requires replication of the organism to some threshold level for producing symptoms.**

For example, the incubation period for anthrax is 1 to 10 days; however cases have been reported several weeks after exposure. The incubation period for smallpox is typically 12 to 14 days with almost all cases showing symptoms by the 17 days after exposure. One reason for the variability in incubation period is that the organism must replicate until it reaches a threshold for producing symptoms, and because of individual susceptibility, the threshold level also varies (Jernigan *et al.*, (2011)).

Infectivity

- **Ability of agent to cause infection**
- **Number of infectious particles required**
- **In person-to-person transmission, secondary attack rate is a measure of infectivity**

Infectivity refers to the minimum number of infectious particles required to cause disease. In person-to-person transmission, the higher the infectivity, the more secondary infections. For example, the infectivity of tuberculosis is low and the infectivity of smallpox is high.

From the above discussion it is clear that it is the more and more information those are needed to be provided through the different ways so that the grass route

people of the country like Bangladesh could get an idea in connection of the different pandemics (Cockburn, (2010)).

1.2 Health Transition

Improved public health measures have resulted in the control of many infectious diseases, and reduction in mortality and fertility. The reduction in mortality is especially visible in the younger ages. Many of the lifestyle risk factors for NCDs like improper nutrition, sedentary life, alcohol and tobacco use are showing an upward trend in these countries. This has led to the emergence of NCDs as important causes of morbidity and mortality in the Region (Conference, 'Vaccination against infectious diseases, animal and human' Hungary, Portugal and France, November, (2006)).

In spite of the "epidemiological transition" or change in the pattern of diseases such that chronic and degenerative diseases have become more important as major causes of morbidity, disability and mortality in wealthier countries, infectious diseases remain as major threats to the health and well-being of human populations. There is also the ongoing HIV/AIDS epidemic which continues to infect and kill large numbers of people worldwide. Social factors are related to the emergence and spread of infectious diseases. However, except for diseases which are more obviously social in their origin and patterns of spread (e.g. sexually-transmitted and blood-borne infections such as HIV/AIDS), social scientists are less prominent in the battle against infectious diseases vis-à-vis their counterparts from the natural sciences (Garson, (2002)).

1.3 In Perspective of Bangladesh

Infectious respiratory diseases were one of the leading cause of death in the developing countries like Bangladesh in the first half of the 20th century. However, during the second half of the 20th century, with the successful implementation of an aggressive childhood immunization program controlling such diseases such as measles, mumps, rubella, pertussis, diphtheria, polio, and *Haemophilus Influenza* type b, the leading killer became chronic disease such as heart disease, diabetes, and cancer (Progress Report: UNAIDS, (2004)).

Disparities among subpopulation in immunization rates have been reduced by a number of programs designed to address barriers to full immunization: access, cost, and knowledge. The Vaccines for Children Program, Medicare coverage of pneumonia and influenza vaccines, and expansions of immunization registries significantly contributed to improved immunization rates. Despite these programs, immunization rates vary by region, racial/ethnic group, socio-economic and insurance status (Progress Report: UNAIDS, (2004)).

Urban and rural immunization rates appear fairly similar for school-age children, with the exception of vaccinations for the varicella zoster virus (causative agent of chicken pox), which have lower rates in rural areas. Research examining immunization rates among preschool children in rural and urban areas reveal mixed results with studies reporting lower, comparable, and, in some cases, higher immunization rates among preschoolers for certain vaccines and vaccines series in rural and urban areas fall below the HP2010 goals (Weekly Report, Centers for Disease Control and Prevention, (2010)).

The nation as a whole has been successful in increasing immunization rates to record highs and controlling many infectious diseases; however, this is not the case in many countries. Endemic, emergent, and re-emergent infectious diseases are leading causes of morbidity and mortality throughout the world and represent a global public health challenge by nature of the transmissibility of pathogens across borders. International travel and commerce, increased use of anti-microbial agents and persistence of immunization disparities in special populations (e.g., the elderly, minorities and foreign born individuals) represent opportunities to introduce and promulgate microbial threats to this country, reinforcing the need for vigilant immunization and surveillance programs at home and broad (Hewitt, (2012)).

1.4 Prevalence and Disparities of the Infectious Diseases

There is considerable variation by age, ethnicity, region, socio-economic, and insurance statues regarding prevalence and susceptibility to infectious diseases, immunization rates, and morbidity and mortality. To capture the variation among

theses various subgroups, this review focuses primarily on the following special population groups: children, adults, elderly, minorities, and immigrants (Lederberg, (2000)).

Children

Childhood vaccination rate are considered a marker of the general quality pediatric care given the high correlation between immunization and other measures of preventive care. Thus, disparities in immunization coverage rates may reflect problems in the quality of pediatric health care for these subgroups. High immunization rates have resulted in low rates of vaccine preventable diseases (VPD) and subsequently, insulted the U.S. from many of the consequences of such diseases. Without vaccines, children under age 18 are estimated are estimated 22 times more likely to acquire measles and 6 times more likely to acquire pertussis (Whooping cough). Children in day care facilities would be 60 times more likely to acquire measles and 16 times more likely to acquire pertissis (Komar, (2003)).

Childhood morbidity and mortality have been dramatically reduced in the past 50 years with routine vaccinations. The public health practice of promoting vaccine use among all U.S. children has resulted in the eradication of smallpox, the elimination of poliomyelitis from the Western Hemisphere, and the control of other infectious diseases such as measles, rubella, tetanus, diphtheria, and *Haemphilus influenza* type b. As of 1998, the annual number of cases for nine vaccine-preventable diseases (smallpox, diphtheria, pertissis, tetanus, poliomyelitis, measles, mumps, rubella, and Haemophilus influenza type b) decreased between 95 percent and 100 percent since 1900 (*Student Guide: Postgraduate Studies*. University of Namibia, (2011)).

Adults

Hepatitis, tuberculosis, HIV, influenza, and pneumonia together represent significant causes of morbidity and mortality among adults. The primary focus of this section is an influenza, pneumonia, hepatitis, and tuberculosis among adults. HIV, with an estimated 40,000 new infections each year, 80,000 to 90,000 people

living with the diseases, and a significant risk factor for TB, 90 is not discussed in depth in this area (Centers for Disease Control and Prevention, (2010)).

1.5 Mortality and Morbidity Condition

The death rate from complications of vaccine-preventable diseases is higher is higher among adults (50,000 to 90,000 annually) than among children (300 each year) ((Centers for Disease Control and Prevention, 2010). Influenza and pneumonia are responsible for more illnesses and deaths than all other VPDs, together constituting the seventh leading cause of death in the developing countries. According to the 2001 National Vital Statistics Report, 67,024 death were attributed to these two diseases. Of all influenza deaths (approximately20, 000), more than 90 percent over ages 65 (Centers for Disease Control and Prevention, 2010). An estimated 40,000 pneumonia deaths are attributed to pneumococcal infection, half of which could be prevented through vaccines. While very young children and elderly are at the highest risk for pneumococcal infection, the vast majority of deaths caused by pneumococcal infection (pneumonia, bacteremia, and meningitis) occur in the elderly. For pneumococcal disease, the case fatality rate is 15 to 20 percent for adults and 40 percent for the elderly. Ten to 25 percent of adults with pneumococcal pneumonia develop bacteremia, with a mortality rate of 20 percent (Purugganan *et al.*, (2011)).

One-fourth of visits to physicians are infectious diseases related, with annual costs over 120 billion dollar reinforcing prevention through full immunization coverage as the most cost effective approach to infectious diseases control. According to CDC 1995 data it is estimated that for every dollar spent on immunizations, 14-25 dollar in health care costs are saved (Health Sciences Library, University of Washington, (2012)).

Ten to twenty percent of population becomes ill with influenza each year, contributing to an estimated 100 to 2010 million days of illness, lost work days, and lost school productivity. Pneumococcal pneumonia, caused by *Streptococcus Pneumonia* , is the leading cause of community acquired bacterial pneumonia in very young children and those 65 years of age and older. This disease causes

3,000 cases of meningitis, 50,000 cases of pneumonia, seven million cases of otitis media, and leads to 100,000 to 175,000 hospitalizations (Health Sciences Library, University of Washington, (2012)).

The World Health Organization (WHO) collects information on global deaths by International Classification of Diseases (ICD) code categories. The following table lists the top infectious diseases killers which caused more than 100,000 deaths in 2002 (estimated). 1993 data is included for comparison (Weiss *et al.*, (2010)).

Table 1.5.1: Ranking of the to Infectious Diseases Killer in the Global Area

Rank	Cause of Death	Death 2009	Percentage of all Deaths	Deaths 1993	1993 Rank
N/A	All Infectious Diseases	14.7 million	25.9%	16.4 million	32.2%
1	Lower respiratory infections	3.9 million	6.9%	4.1 million	1
2	HIV/AIDS	2.8 million	4.9%	0.7 million	7
3	Diarrheal diseases	108 million	3.2%	30 million	2
4	Tuberculosis (TB)	1.6 million	2.7%	2.7 million	3
5	Malaria	1.3 million	2.2%	2.0 million	4
6	Measles	0.6 million	1.1%	1.1 million	5
7	Pertussis	0.29 million	0.5%	0.36 million	7
8	Tetanus	0.21 million	0.4%	0.15 million	12
9	Meningitis	0.17 million	0.3%	0.25 million	8
10	Syphilis	0.16 million	0.3%	0.19 million	11
11	Hepatitis B	0.10 million	0.2%	0.93 million	6
12-17	Tropical diseases	0.13 million	0.2%	0.53 million	9, 10, 16-18

Note: Other causes of death include maternal and perinatal conditions (5.2%), nutritional deficiency (0.9%), non-communicable conditions (58.8%), and injuries (9.1%).
Source: WHO, 2009

The top three single agent/disease killers are HIV/AIDS, TB, and Malaria. While the number of deaths due to nearly every disease have decreased have decreased, deaths due to HIV/AIDS have increased fourfold. Childhood diseases include pertussus, poliomyelitis, diphtheria, measles and tetanus. Children also make up a large percentage of lower respiratory and diarrheal deaths (Weiss *et al.*, (2010)).

1.6 Hepatitis B

Hepatitis B virus (HBV) infection is a worldwide problem and between 350 and 400 million persons is estimated to suffer from this infection. HBV infection is a contagious disease that may transmit vertically from mothers to their neonates or horizontally by means of blood products and body secretions. The first published report about HBV infection in Iran was in 1972. In later studies, the rate of HBV infection was reported from 1% to 2.1% in 1977 while further reports stated higher rates (between 3.5% and 2.49 in both voluntary blood donors and general population from 1988 to 1993 (Weiss *et al.*, (2010)). In Islamic Republic of Iran (I.R. Iran) mass vaccination of neonates against HBV infection started from 1993 as a national program in routine neonates care. This program is supposed to affect the prevalence rate of HBV infection thorough the country and decrease the rate of infection after a while (Purdue Online Writing Lab., (2012)). More recent studies reported the range of HBV infection between 1.2 to 9.7 percent in different regions of the country. Generally, it is estimated that about 1.5 to 2.5 million people are suffering from HBV infection in I.R. Iran, and some of them are carriers that may transmit infection to others unintentionally (Primary health care. (n.d.). In *MeSH database*, (2011)).

Hepatitis B is an infectious inflammatory illness of the liver caused by the hepatitis B virus (HBV) that affects hominoidea, including humans. Originally known as "serum hepatitis" the disease has caused epidemics in parts of Asia and Africa, and it is endemic in China. About a third of the world population has been infected at one point in their lives including 350 million who are chronic carriers (Centers for Disease Control and Prevention, (2011)).

The virus is transmitted by exposure to infectious blood or body fluids such as semen and vaginal fluids, while viral DNA has been detected in the saliva, tears, and urine of chronic carriers. Perinatal infection is a major route of infection in endemic (mainly developing) countries (Centers for Disease Control and Prevention, (2011)). Other risk factors for developing HBV infection include working in a healthcare setting, transfusions, dialysis, acupuncture, tattooing, extended overseas travel, and residence in an institution. However, Hepatitis B

viruses cannot be spread by holding hands, sharing eating utensils or drinking glasses, kissing, hugging, coughing, sneezing, or breastfeeding.

The acute illness causes liver inflammation, vomiting, jaundice and, rarely, death. Chronic hepatitis B may eventually cause cirrhosis and liver cancer—a disease with poor response to all but a few current therapies. The infection is preventable by vaccination (Centers for Disease Control and Prevention, (2011)).

Hepatitis B virus is an hepadnavirus—*hepa* from *hepatotropic* (attracted to the liver) and *dna* because it is a DNA virus—and it has a circular genome of partially double-stranded DNA. The viruses replicate through an RNA intermediate form by reverse transcription, which in practice relates them to retroviruses (Ungchusak *et al.*, (2005)). Although replication takes place in the liver, the virus spreads to the blood where viral proteins and antibodies against them are found in infected people. The hepatitis B virus is 50 to 100 times more infectious than HIV (Duke University Medical Center Library, (2012)).

1.7 HIV/AIDS

HIV and AIDS have changed the way we go about our daily lives. We have seen an increase in the prevention, treatment and care for this disease over the years, at the same time more lives have been lost to this preventable and fatal disease. In 2008, there were about 32.2 million People Living with HIV (PLHIV) worldwide,1 2.7 million people newly infected with the virus annually and about 2 million deaths. 1 In the Pacific region, there were about 29,629 reported HIV cases and 5,162 new cases in 2008 (Ontario Public Health Library Association (OPHLA), (2008)). Although most Pacific Island Countries (PIC) are classified as low prevalence, the incidence of HIV has been increasing since the first case was reported in 1984 (Leenaars *et al.*, (2012)).

For transmission of HIV to occur, four conditions are needed:

- Virus must be present in a person's body fluid
- It must be present in sufficient quantity to cause infection
- There must be an effective route of transmission into the body of another person, and

- It must reach cells that HIV can infect in that person's body.

When someone has HIV, it can be present in potentially infectious quantities in blood, semen, vaginal fluids, rectal secretions and breast milk. Transmission of HIV can happen if one of these fluids gets into somebody else's body, either directly into the bloodstream (such as in injecting drug use, or from an HIV-positive woman to her baby), or through unprotected anal, or vaginal sex, and much less often, unprotected oral sex (Taylor, (2010)).

Various factors affect the risk of HIV transmission. How likely it is that transmission will occur is directly linked to the viral load of the HIV-positive person. The more virus that is present, the more likely it is to be passed on. In this context we sometimes talk about 'infectiousness' (Taylor, (2010)).

1.8 Review of Literature

It is estimated that 40% of the world's population is become conscious through the process of accessing the different electronic medias (Peters, (2007); Fix *et al*, (2007)). This has been similar to our study where it has been got that for both of the diseases (i.e., HB and HIV/AIDS) the access of the electronic media has been the pivotal contributor in the case of being aware.

The place of living is one of the important determinant in assessing the consciousness of the people regarding HIV/AIDS (Al-Manarah *et al*, (2009)) and it has also been agreed by our study as we have found that the place of residence has the significant contribution in the case of having the tendency of accessing with the electronic media (i.e., TV) that has also the direct impact on increasing the knowledge and consciousness about the pandemic.

It is estimated to be approximately 57% of the studied respondents who have the direct access with TV have taken the HB vaccination whereas only 38% of the respondents among those who don't have the access to TV have taken the HB vaccination. This has been reflected by the studies of Amin *et al* (2012) in the

D - 3814
14/6/15

rural area of Bangladesh. Respondents who have got vaccination of HB most of them have the exposure to electronic media.

With 10 percent increase of respondent's income the probability of taking protected drinking water is increased by 1.17 percent. Again, 10 percent increment of the habit of watching TV is eligible for making an increment over the probability of growing the habit of taking protected drinking water. Robart *et al.*, (2011) has got the similar findings as it has been found that with having the uplift in the economical status the tendency of taking the protected drinking water has been increased and the electronic media has the contribution in this connection of making the respondents more aware of having the protected drinking water.

In this study it has been found that the variable named "Sources of Drinking Water" has the contribution to the selected dependent variable as we have got that the respondents who get the protected drinking water are 1.6 times more likely to get the vaccination of HB than of the reference category. The sources of drinking water has also the connection in the case of vaccination taking tendency (Alter, (2011); Techalew *et al.*, (2010)).

For Hepatitis B evidence has been found that watching TV provides more information regarding any aspects which has a greater impact on the storage of knowledge. In case of correlation with the electronic media with the pandemic Hepatitis B viruses the underlying study has got the findings as with the up gradation of the exposure to the electronic media, the storage of knowledge in connection of the consciousness regarding the HB has been increased (Robart *et al.*, (2010)).

The result from our study implies that the electronic media which is one of the vital sources of knowledge about HIV/AIDS could only be afforded by those who have a certain enhancement level of education and of those who have comparatively a better place of residence (i.e., those who live in urban area). This has been supported by Naser *et al.*, (2009).

It has been noticed that the respondents with having the higher economical status have more tendency of taking HB1 vaccine (72.7 percent) than of those who are the respondents with lower economical status (31.9 percent). The agreement has also been found regarding this issue by Maswell *et al.*, (2011).

The urban people are more aware in terms of having more habit of using condom for keeping themselves way from HIV/AIDS that of the counter part of the respondents who belong to some rural place (0.809 times more likely to use condom than the reference category 1). This result has been supported by Mauss *et al.*, (2012) as it has been found that the urban people is more conscious in gaining the knowledge on HIV/AIDS and HB for having the up-to date facilities than that of the rural counterpart.

The respondents who are the job holders those are more frequent to use condom than other occupational categories. Musa *et al.*, (2011) have got that the job holder are more frequent users of condom as the security measures than that of the other occupational categories.

Sources of drinking water is another selected independent variable where it has been observed that the respondents who used to get the unpolluted drinking water are more likely to get conscious in terms of having more habit of using condom at the time of sexual intercourse. Sikandar *et al.*, (2011) have got that fact that among the HB affected people the polluted drinking water users are more less in number who use the vaccination for keeping themselves way from different sort of HB oriented diseases.

As far as the educational enrollment is concerned the literate respondents are more likely (2.69 times) to take the HB1 vaccine as the preventive measure than the illiterate counterpart those are considered as the reference category. This has been supported by Mukwa *et al.*, (2010). They found that the respondents who have the strong educational enrollment are more likely to get the vaccination as their preventive measure than that of the respondents of having the less educational enrollment.

Economic status has it's own role to play as it has been found by Kesow *et al.*, (2010) that the higher economic status holder are more conscious and knowledgeable than that of the respondents who are less economical status. This finding has been similar with our study that the majority of the respondents with high economic status (77.1 percent) used to use condom at the time of sexual intercourse but for the respondents with low economic it can easily be seen that the majority of 67.5 percent not used to use condom at the time of sexual intercourse.

By electronic media it is possible to know the protective measure of keeping oneself away from hepatitis B1 as we can notice that those who are used to watch TV are most of them (87.2 percent) take HB1 vaccine but in comparison with those respondents who are not used to watch TV are less in number (38.3 percent) who take the HB1 vaccine as a protection measure of HB. This has been supported by Puoti *et al.*, (2012).

Furthermore the respondent's income and the habit of watching TV also have an impact on the respondent's educational attainment. With the advancement in income and watching TV a respondent can be able to enhance his educational attainment and with the advanced educational attainment the knowledge regarding the HIV/AIDS and HB have been enhanced. The correlation between the watching TV and educational attainment has also been found. (Chein *et al.*, (2011)).

Access to news paper play the pivotal role in the field of getting more information about different affair that leads a person to become more aware. In our study it has been found that the having of habit reading newspaper makes respondents 1.657 times more aware of Hepatitis B (HB) than of those who haven't have the access of newspaper. This has been supported by the Mauss *et al.*, (2010). It has been found that the respondents who have the access to newspaper are more aware of Hepatitis B than that of the respondents who haven't the access to news paper or print media.

Protected drinking water has it's role in making the respondents more aware of keeping themselves away from the pandemic of HB than that of the other group of

people who don't take any protected drinking water. Murary *et al.,* (2010) has got the same findings as they have got that the respondents who have the habit of taking the protected drinking water are more aware than that of the respondents who take the unprotected drinking water.

Income and place of residence has a very pivotal contribution increasing the conscious level about HIV/AIDS. It is quite clear that with the increase of income and having been an urban resident a person could be able to know many important information regarding various diseases through exploring verities of information as electronic media, mass media, internet and like. It ahs been found from the study of Murary *et al.,*(2012) that the respondents belong to the urban area have the tendency of having a higher economical status are more frequent to access more up to date information regarding the pandemics (i.e., HIV/AIDS and HB).

The respondents of the age group 41-50 are 2.37 times more conscious than the reference category (i.e., age group of 21-30 years.). It has been found from the study of Fix *et al.,* (2011) that the respondents of age category 40-50 are more aware in terms of using the condom at the time of sexual intercourse than that of the early age category holder respondents.

In another comparative study from cote d'Ivoire, Malawi and Tanzania, the prevalence of HIV/AIDS is associated to the respondents who have the higher educational enrollment (Peters *et al.,* (2011)). This result has the relevance with the result of our study where we have got that the respondents with strapping educational background are more aware.

One cross-sectional study done among people attending VCT clinic of St Paul's General Specialized Hospital in Addis Ababa found the prevalence of HIV/AIDS is 4.5% more to the respondents who don't have the access to either electronic or print media than that of the group of the respondents who have the access to both electronic media or print media (Techalew *et al.,* (2011)). This has the similar result that has been found from our result where we got that the respondents having the access to electronic and print media are more aware than that of the respondents who don't have the access to sort of media.

It has been noticed from our study that the respondents with having the higher economical status have more tendency of taking HB1 vaccine (72.7%) than of those who are the respondents with lower economical status (31.9%). Puoti *et al.*, 2012 have found that the respondents of economically stable have the tendency to have the routine medical check-up and have also the habit of having the vaccination of Hepatitis B that of the other respondents who are in the unstable economical status.

If patients are HBsAg negative, they should receive HBV vaccination (Peters, 2007; Puoti *et al.*, (2012)). In spite of having the prescribed research the majority of the respondents of not having the sound educational background, not having the stable economical status and not having the habit of accessing to electronic and print media are not at all conscious in having the habit of taking the protective measures for protecting oneself away from the pandemic.

The job holders are more frequent to take the vaccination than of the other respondents with the different occupational category holder. Parker *et al.*, (2007) has also got the same sort of result as they found that the respondents who are the job holders have the more tendencies to get the vaccination than that of the respondents who don't have the involvement in any sort of job.

Gomez-Gonzalo *et al.*, (2012) found in another research that the respondents who have the habit of using condom at the time of sexual intercourse, among them majority are from the urban area. This is also the same result that have been found from the result of our study.

1.9 Importance of the Study

It is essential to integrate knowledge, awareness and consciousness about infectious disease and promote social program on attitude, behavior, prevention, and also thereby organize health promotion program in social setting. From this point of view this study is aimed to analyze the knowledge, attitude, behaviours and the institutional readiness and potential for integration of various life threatening infectious diseases related knowledge, awareness among the people of

the developing country like Bangladesh. Infectious disease related education as HIV/AIDS and other STIS and other viral or bacterial infectious diseases, mode of their transmission and means of prevention are not available to all in developing countries. One of the ways to prevent or slow down the transmission of infectious diseases is to recognize the different characteristics of various diseases (World Health Organization, (2008)). Some critical disease characteristics that should be evaluated include virulence, distance traveled by victims, and level of contagiousness. It is notified that HIV/AIDS and HB as appeared as two silent killer diseases and become threatened to modern civilization for developed and under developed countries. So any study regarding knowledge and consciousness is very important to have the clear idea regarding this issue. In contrast, Human Immunodeficiency Virus (HIV) kills its victims very slowly by attacking their immune system. As a result, a lot of affected persons transmit the virus to many others before even realizing that they are carrying the diseases. Also, the relatively low virulence always its victims to travel along distance, increasing the likelihood of an epidemic. This study tackles these issues head on. Regarding all the facts discussed above it could be understood that through more and more impeccable and quality research on the infectious diseases the vulnerability group could be detected and also it will be possible to make some rescue activities to bring those groups out from various types of the pandemic created by theses infectious diseases (World News, (2012)). Considering all the discussion mentioned above, this study has been made by more and more comprehensive and intensive approach to develop the knowledge and increase the consciousness level about Hepatitis B and HIV/AIDS.

1.10 Objectives of the Study

Infectious diseases continue as the major cause of morbidity and mortality in Bangladesh and worldwide. As a result of poverty, population density, poor sanitation, malnutrition, and disease transmitting insect vectors, there is further need for enhanced prevention, diagnosis and management of a wide array of diseases with infectious diseases with infectious etiologies including pneumonia, diarrohoeal diseases, tuberculosis measles, vector born diseases with infectious diseases like dengue, malaria, visceral leishmaniasis (Kala azar) and filariasis.

Drug-resistance infectious diseases will continue to strain resources and threaten existing methods for effective therapy. Of added concern are serious diseases for which effective prevention strategies already exist but remain a problem for much of Bangladesh, such as measles (for which the existing affordable vaccines are under utilized) and *Hemophilus Influenza* type B (Hib), hepatitis B, typhoid, and pneumococcal diseases (for which safe and effective vaccines exist, but cost is a barrier to their introduction, acceptance, and use). The scientist identified a new strain of cholera, *V Cholera* O 139 (Bengal) that emerged in 1992 and traced its evaluation. This is the first time that the scientists have been able to watch a new pathogen emerge and evolve prospectively (World News, (2012)). Presently the scientists are in a position to prepare how to deal with this new pandemic strain, and potentially develop a vaccine that would decrease the number of deaths as caused by past cholera pandemics. Now, the objectives of this research are:

1. To investigate the differential patterns of the infectious diseases (i.e., Hepatitis B and HIV/AIDS).
2. To identify the interaction effects of the factors which influence knowledge and consciousness of the studied population.
3. To find out the factors affecting the conscious level of the people.
4. To find out the intensity of the effect of the different socio-demographic and health related characteristics act as the determinants of HIV/AIDS and Hepatitis "B" virus.

1.11 Limitations of the Study

To execute every research there may some obstacles. In this research some obstacles are also faced. The most important is the availability of data on different infectious diseases. In Bangladesh Demographic and Health Survey (BDHS), 2007 there was a scarcity of data on infectious diseases as this is the main source of data for the research. That's way the research had to be kept within the two infectious diseases Hepatitis B and HIV/AIDS. It would have been better if I would have the opportunity to consider more data on some other infectious diseases. In the further research this limitation will be trying to be mitigated.

1.12 Organization of the Study

In order to furnish a meaningful representation of the study, the dissertation presented the information into six chapters. The chapter-based topics introduced in each chapter are mentioned below:

The first chapter contains the research perspective with some of the basic information about the infectious diseases, review of the literature, objective and importance of the study.

Chapter two named "Data and Methodology" has been involved in exposing the sources of data and the interpretation of the different methods used.

Chapter three titled "Differential Patterns of Having Knowledge & Consciousness about Hepatitis B and HIV/AIDS"has been furnished with the background characteristics. In this chapter we tried to find out the association between various selected dependent variable and independent variables.

Our fourth chapter is named "Factors Affecting Knowledge & Health Consciousness about HIV/AIDS & Hepatitis B1 (HB1): An Application of Logistic Regression" Here, we employed the logistic regression model as the multivariate analysis. In this chapter we have incorporated two logistic regression models to find out the relative risk of the infectious diseases.

"The Interaction Effects of the Factors Influencing Knowledge and Consciousness of the Study Population" is the title of the chapter five, which is the most important part of the study that deals with another multivariate analysis named "Linear Probability Model (LPM)". LPM analysis was included to determine the direct, indirect and the joint effects of the selected factors on the selected dependent variables.

The last chapter has been titled as the "Conclusion and Policy Implications" where the overall summary of the result with respect to the various techniques used have been disclosed to make a review of the study at a glance with the necessary policy recommendations to fulfill the work of my dissertation. The bibliography of the study has been attached after the chapter six where the references of the study have been enclosed all together.

Chapter Two

Data and Methodology

2.1 Introduction

Data collection is an essential segment of any study whether it is census or survey. Research methodology is the philosophy of research to systematically solve the problem. In methodology, we study the various steps that are generally adopted by a researcher in studying his research problem along with the logic behind them. Methodology is must for every kind of research problems and execution of research work. Systematically, it is very essential to collect accurate and sufficient data to prepare a dissertation.

2.2 Data

2.2.1 Sources of Data

The sample for the Bangladesh Demographic and Health Survey (BDHS) 2007 also covered the entire population residing in private dwellings units in the country. Administratively, Bangladesh was divided intro six divisions, which in turn, each division were divided into zilas and upazilas. Each urban area in the upzila was divided into wards, and into mahallas within the ward; each rural area in the upazila was divided into union parishads (UP) and into mauzas within the Ups. This survey was based on a two-stage stratified sample of households. The urban areas were stratified into three groups, i) Standard metropolitan areas, ii) Municipality areas, and iii) Other urban areas. These divisions allowed the country as a whole to be easiiy separated into rural and urban areas. The 2007 BDHS sample was a stratified and multi stage cluster sample consisting of 361 primary sampling units (PSUs), 134 in the urban area and 227 in the rural area (PSUs). A total of 10,819 households, on average 30 households from each PSU, were selected for the sample using and equal probability systematic sampling

technique, of which 10,461 were found to be occupied and 10,400 were successfully interviewed. Finally, the survey was designed to obtain 11,485 completed interviews with ever-married women age 10-49, covering 4,360 interviews from urban areas and 7,125 from rural areas. All ever-married women age 10-49 in selected households and ever-married men age 15-54 in every second households were considered as eligible respondents. But finally, a total of 11,178 eligible women age 15-49, 4,230 from urban areas and 6,948 from rural areas were selected in these households and 10,996, 4,151 from urban areas and 6,845 from rural areas were interviewed. Data for ever-married women age 10-14 have been removed from the data set to use for the present study. Accordingly 4,074 potential eligible men in every second households were selected, of them, 3,771 were successfully interviewed.

In this survey five questionnaires vize., households questionnaire, women's questionnaire, men's questionnaire, community questionnaire and facility questionnaire following MEASURE DHS Model Questionnaires have been used.

The survey was conducted to determine on the respondent's background characteristics (age, residential history, education, religion, media exposure etc.); reproductive history; knowledge and use of family planning methods; antenatal and delivery care; nutrition; vaccinations and health of children under age five; marriage; fertility preference; husband's background and respondent's work etc.

Data collected from field were edited, coded and processed at MItra and Association using CSPro, a joint software product of the US Census Bureau, Macro International, and Serpro S.A.

The data has collected from these six administrative divisions for the country- Barisal, Chittagong, Dhaka, Khulna, Rajshahi and Sylhet. The present study utilizes the BDHS with having a sample of 3151 where 2000 are females and 1151 are males.

2.2.2 Data Processing and Analysis

The easiest procedure of analyzing the data is to use computer program. At present no body thinks to analyze data without a suitable computer program. No other alternative is available to analyze the data quickly, easily and correctly. The SPSS' 2007 computer program has been used for analyzing the data.

2.3 Methods of Statistical Analysis

Methodologies used in applied research are equally important as the data. Every methodology is not suitable for analyzing every set of data. Matching of an appropriate methodology for graduating & analyzing a set of data is of data is a difficult task for researcher. For this reason, in most of the times, researches use alternative at methodology to graduate & analyze a set of data. Finally they compare the findings obtained from different methodology & support the most, logical one as compared with the reality. So here different suitable statistical analysis are used. Here the following statistical analysis have been applied:

2.3.1 Bi-variate Analysis

The contingency analysis investigates the degree of association within the two categorical variables. Examining of association is performed by means of contingency table.

Contingency Table and Chi-Square Test

Table 2.3.1.1: Contingency Table and Chi-Square Test

Y / X	Y_1 Y_2 ..... Y_c	
X_1 X_2 : X_r :	0_{11} 0_{12} ..... 0_{1c} 0_{21} Y_{22} ..... Y_{2c} : : 0_{r1} 0_{r2} ..... 0_{rc}	
		N = Grand total

dependent an
assumption t d independent variables are measured in interval scale under the
discriminate hat they are normally distributed with equal variances. Linear
the assumptic analysis does not allow direct prediction of group membership, but
equal varianc n of multivariate normality of the independent variables as well as
be optimal. I e-covariance ices in the groups, is required for the prediction rule to
where the de ogistic regression analysis is similar to a linear regression model
and 0 (event pendent variable is a dichotomous one, coded as 1 (event occurring)
or categorica does not occurring). The independent variables can be interval level
denote the d l; if categorical, they should be dummy or indicator coded. Let Y_i
individual is ichotomous dependent variable for ith observation and Y_i=1, if i-th
(event does a success (event occurs) and Y_i=0, if the ith individual is a failure
variables X_{i1} not occurs). Suppose that for each of the individuals k independent
distributed v, X_{i2}, ...X_{ik} are measured and it is assumed that Y_i's are normally
success; the with mean P_i and variance and Pi is defined as the probability of
logistic regression is of the form:

$P_r(P_i) = P_r(Y_i=1) = \frac{e^{\beta_0+\beta_{1xi}}}{1+e^{-(\beta_0+\beta_{1xi})}}$ .....(2)

Or equivalen

$P_r(P_i) = P_r(Y_i=0) = \frac{e^{z}}{1+e^{-z}}$ .....(3)

tly,

Where β_0 ar d β_1 are the regression coefficients estimated from the data; the model
assumes the

$P_r(P_i) = P_r(Y_i=1) = \frac{e^{z}}{1+e^{-z}}$ .....(4)

form:

Or e

Whe quivalently, $P_r(P_i) = P_r(Y_i=1) = \frac{e^{z}}{1+e^{-z}}$ .....(4(1))

From equat re, $z = \beta_0+\beta_1X_{i1}+\beta_2X_{i2}+.....+\beta_kX_{ik}$

$1-P_i$ which ion (3) and (4) completed; however, the logarithm of the ratio of P_i and
We is called logit of P_i turns out to be a simple linear function of X_{ij}.

define, $\text{Logit}(P_i) = Log_e \frac{P_i}{1-P_i} = \sum_{j=0}^{k}\beta_j X_{ij} = \beta_0 + \sum_{j=1}^{k}\beta_j X_{ij}$ .....(5)

The logit is
probability the logarithm of the odds of success, that is, the logarithm ratio of the
transform of success to the probability of failure. It is also called the logistic
of P_i and equation (5) is a linear logistic model. In a logistic regression,

the parameters of the model are estimated using the maximum likelih
logistic model can be rewritten in terms of the odds of an event occurring
P_i increases, so does logit (P_i) and second, logit (P_i) varies over the w
line, whereas P_i is bounded only between 0 and 1. If P_i is less than 0.5, lo
negative; and if P_i is greater than 0.5, logit (P_i) is positive. The equati
written in terms of odds as:

ood. The
First, as
hole real
)git (P_i) is
on can be

$$\text{Odds} = \frac{P_i}{1+P_i} = \exp\left(\sum_{j=0}^{k} \beta_j X_{ij}\right)$$

The exponential rise to the power β_j is the factor by which the odds ch
j-th independent variables increase by one unit. If β_j is positive fact
greater than 1, which means that the odds are increased; if β_j is nega
will be less than 1, which means that the odds are decreased. When
factor equal 1, which leaves the odds unchanged.

ange when
or will be
tive factor
β_j is 0, the

Measuring the Worth of the Model

There are various statistics that have been proposed for assessing the v
logistic regression model, analogous to those that are used in linear reg
examined the two of the proposed statistics as follows:

vorth of the
ression. We

R^2 in Logistic Regression Model

The worth of the linear regression model can be determined by using F
R^2 computed as in linear regression should not be used in logistic regres
not when the possible values of Y are zero and one. It is evident th
dropped considerably for every miss fitted point, so, R^2 can be less than
near- perfect fitting. Cox and Wermuth (1992) also conclude that R^2 s
used when Y has only two possible values, and show that frequently
good models are used.

-square, but
ssion, at least
at R^2 can be
0.9 even for
hould not be
$R^2 \approx 0.1$ when

Various alternative forms of R^2 have been proposed for binomial logit
Maddala (1983) proposed using

model.

$$R^2 = 1 - \left\{ \frac{L(0)}{L(\beta)} \right\}^{\frac{2}{n}} \quad \text{.....(2)}$$

With L (0) denoting the likelihood for the null model (i.e., with no regressors) and $\left(L(\hat{\beta}) \right)$ representing the likelihood function that would result when replaces in the following equation

$$q(Y_1, Y_2, \ldots\ldots\ldots, Y_n) = \prod_{i=1}^{n} P_i^{Y_i} (1 - P_i)^{1-Y_i} \quad \text{.....(3)}$$

Essentially the same expression, except that 2/n was misprinted as 1/n, was given by Cox and Snell (1989). [Equation (2) is motivated by the form of the likelihood ratio test for testing the fitted model against the null model. It can be shown that R^2 as defined in the linear equation is equivalent to the right hand side of the equation (2). Hence, this is a natural form of the R^2 in the logistic regression.] Since, the likelihood function $\left(L(\hat{\beta}) \right)$ is a product of probabilities, it follows that the value of the function must be less than 1. Thus, the maximum possible value for R-square defined by equation (2) is max. $R^2 = 1 - \{(L0)\}^{\frac{2}{n}}$. In linear regression model $\hat{Y} - \overline{Y}$ is used for the null model. Similarly, in logistic regression we would have P-γ for the null model, with γ_1 denoting the percentage of the 1's in the data set. It follows that max $R^2 = 1 - \left\{ \gamma_1^{\gamma_{1n}} (1 - \gamma_1)^{1-\gamma_{1n}} \right\}^{\frac{2}{n}}$. For example, if γ_1= .5, then max R2 = .75. This is the largest possible value of the R2 defined by equation (2). When the data are quite sparse, the maximum possible value will be close to zero. Therefore, Nagelkereke (1991) suggests that $\overline{R}^2$ be used, with $\overline{R}^2 - R^2 / \max R^2$.

Correct Classification Rate (CCR)

We may criticize any statistics that is a function of the $\hat{P}_i$ when Y is binary. Each $\hat{P}_i$ and its closeness to Y_i depends on more than the worth of the model. If our objective is to predict whether a subject will or will not have the attribute of interest, a more meaningful measure of the worth of the model would be the

percentage of the subjects in the data set that classify correctly. Accordingly, we will use the correct classification rate (CCR) as a measure of the fit of the model.

2.3.2.2 Linear Probability Model (LPM)

Let us consider a simple model

$$Y_i = \beta_1 + \beta_2 X_i + u_i \quad \text{.....(1)}$$

Where, X_i is explanatory variables, Y=1 when respondents respond positively, Y=0, otherwise.

This model express the dichotomous Y_i as a linear function of the explanatory variables X_i and is called liner probability model. Now the conditional expectation of Y_i given X_i can be interpreted as the conditional probability that the event will occur given X_i, that is $\Pr(Y_i = 1/X_i)$.

Assuming $E(u_i)=0$, to find an unbiased estimator we obtained $E(Y_i/X_i) = \beta_1 + \beta_2 X_i$. Now letting P_i probability that $Y_i = 1$ (the event occurs) and 1- P_i = probability that $Y_i = 0$ (the event does not occur), the variable Y_i has the following distribution:

Y_i	Probability
0	$1 - P_i$
1	P_i
Total	1

Now by the definition of mathematical expectation we obtain

$$E(Y_i) = 0(1 - P_i) + 1(P_i).$$

Thus we can write the conditional expectation as probability, that is $E(Y_i / X_i) = \beta_1 + \beta_2 X_1 = P_i$. Since the probability P_i must be lied between 0 and 1. We have the restriction, $0 \le E(Y_i / X_i) \le 1$, that is the conditional expectation or conditional probability must lie between 0 and 1.

Here X_1 X_2 .....X_3 are the r- category of the attribute X and Y_1 Y_2 .....Y_c are the c- category of the attribute Y. 0_{ij} is the observed frequency of i-th category of X and j-th category of Y. N is the grand total. To test the homogeneity between two attributes the following hypothesis is used.

Null hypothesis (H_0): There is no association between X and Y

Alternative hypothesis (H_1): H_o is not true

$$\chi^2 = \sum_i \sum_j \frac{(O_{ij} - E_{ij})^2}{E_{ij}} \approx \chi^2_{(r-1)(c-1)}$$

To test the homogeneity the following statistics is used:

We know that the null hypothesis might be accept at the 5% level of significance, if the 2-sided asymptotic significance level is less than. 0.05, otherwise the null hypothesis is may be reject. For this particular problem, we observe that the null hypothesis is might be accepted at the 5% level of significant when the when the Perso's chi-square test is used.

2.3.2 Multi Variate Analysis

It refers to those analyses where multiple variables are used to get the intensity of the different selected independent variables upon the selected dependent variables through accessing Logistic Analysis, Linear Probability Model (LPM) etc.

2.3.2.1 Logistic Regression Analysis

An interesting method that does not require any distribution assumption concerning explanatory variables is Cox's linear logistic regression model (1972). The logistic regression model can be used not only to identify risk factors but also to predict the probability of success. The model is now widely used in research work to access the influence of various socio-economic and demographic characteristics for controlling the effect of other variables on the likelihood of the occurrence of the event of interest. There are a variety of multivariate statistical techniques that can be used predict a binary dependent variable from a set of independent variables. Multiple regression analysis and discriminate analysis are two related techniques but these techniques are applicable only when the

The general expression of the linear probability model (LPM) is

$$Y = \beta_1 + \beta_2 X_1 + A + \beta_{k+1} X_k + u \quad \ldots\ldots(2)$$

Where Y equal to 1 or 0 according as if respondents respond positively or otherwise and X_i's are the explanatory variables.

Justification of the Linear Probability Model (LPM)

Linear Probability Model (LPM) is one of the admired models to get the idea about the factors affecting the selected dependent variable. The model has been used in several analysis in connection of assessing the probability of occurring a particular event with the associated factors to the occurrence with their level of impact. The rate of progression from acute to chronic hepatitis B is primarily determined by the age at infection and T-cell response by using the LPM model (Murray *et al*, (2012)). In another comparative study from Cote d'Ivoire, Malawi and Tanzania, the prevalence of co infection is found to be similar between HIV uninfected and HIV-infected individuals (6.0 14.4% and 9.0-13.9%, respectively). Here also the LPM has played a pivotal role (Murray *et al*, (2012)).

2.4 Variables Selection

The variables used in the different analysis of this study have been presented below in tabular format with respect to the different analysis used.

Dependent Variables	Independent Variables
1. **Hepatitis B Vaccination** (Yes = 1 and No =0) 2. **Use Condom at the time of Sexual Intercourse** (Yes = 1 and No =0)	1. **Age (Category:** ≤20 = 1, 21-30 =2, 31-40 = 3 and 41-50 = 4) 2. **Sex (Category:** Male = 1, and Female = 0) 3. **Occupation (Category:** In Job = 1, Business = 2, Agriculture = 3, Labour = 4 and Others = 5) 4. **Educational Status (Category:** literate = 1and Illiterate = 0 5. **Place of Living (Category:** City =1and Village= 0) 6. **Sources of Drinking Water (Category:** Unpolluted = 1 and Polluted = 0) 7. **Economic Status (Category:** High Economic Status = 1 and Low Economic Status = 0) 8. **Health Check up (Category:** Regular = 1 and Irregular = 2 and Don't take any Checkup = 3) 9. **Watching TV (Category:** Yes = 1 and No = 0) 10. **Access to News Paper (Category:** Yes = 1 and No = 0) 11. **Heard the Name of HIV/AIDS (Category:** Yes = 1 and No = 0) 12. **HIV is Transmitted through Using Same Needle (Category:** Yes = 1 and No = 0) 13. **HIV is Transmitted through Taking Food from the HIV Infected Person's Plate (Category:** Yes = 1 and No = 0) 14. **HIV is Transmitted Through Wearing the Infected Person's Cloths (Category:** Yes = 1 and No = 0). 15. **HIV is Transmitted Through Affected Mother's Breast's Milk. (Category:** Yes = 1 and No = 0).

2.4.1 Justification of the Variables Used in the Study

Here the selected dependent variables for the different analysis have been determined in a meaningful manner. As we made the research on the two most life threatening infectious diseases; HIV/AIDS and Hepatitis B (HB), it can be observed from the above Table that the dependent variables have been categorized for two of the diseases (i.e., HIV/AIDS & Hepatitis B). In the Bi-variate analysis the selected dependent variables for HB is "Hepatitis B Vaccination" and for the HIV/AIDS; "Use Condom at the time of Sexual Intercourse", in the same way for the Logistic Regression; "HB Vaccination" for analyzing the intensity of the knowledge and consciousness to HB and "Use Condom at the time of Sexual Intercourse" for analyzing the knowledge on HIV/AIDS disease. Furthermore, for the Linear Probability Model (LPM); "Respondents Take HB Vaccine" for HB and "Respondents Use Condom at the time of intercourse" for HIV/AIDS. Here it is being seen that all the dependent variables for analysing the intensity of the knowledge and consciousness to the selected diseases (i.e., Hepatitis B and HIV/AIDS) of the respondents are consciousness and knowledge oriented. For instance if the respondents are conscious and have the skill and knowledge regarding the pandemics they will must be aware of taking the preventive measures through having the vaccination for protecting from HB and using condom at the time of sexual intercourse for keeping away from HIV/AIDS. In the case of independent variables the aforesaid Table shows that the available demographic variables (i.e., Age, sex, occupation, Economical Status etc.) and with respect to the selected dependent variables for the two different diseases the different independent variables have been chosen to detect the respondents' depth of knowledge about the pandemics (i.e., Access to print media, electronic media, sources of drinking water, place of residence etc.). So it can be said that the variables of the research have been selected in such a meaningful way so that the core objectives of indentifying the exposure of the knowledge and consciousness of the said respondents is detected.

Chapter Three

Differential Patterns of Having Knowledge & Consciousness about Hepatitis B and HIV/AIDS

3.1 Introduction

Examining of association is performed by means of contingency table. In this chapter we have made two cross tables to show the degree of association. First table shows the association among HB1 Vaccination and some selected socio-demographic variables which are available in our data. Other table shows the association among Use Condom at the time of Sexual Intercourse (in terms of awareness of HIV/AIDS) and some selected socio-demographic variables which are also available in our data.

3.2 Bivariate Distribution for Hepatitis B1 (HB1) Vaccination with the Different Socio-Demographic Variables

Table 3.2.1 given below presents the association among the HB1 Vaccination and some selected Socio-Demographic variables.

From the following Table 3.2.1 it can be disclosed that 65.8% of the total respondents of aged <20 haven't taken Hepatitis B1 (HB1) Vaccination and among the rest 34.1% of the total of aged <20 years have taken the HB1 vaccine as their preventive measure. The majority of the respondents belong to the age groups of 31-40 and 41-50 have taken HB1 vaccine (72.2 percent & 77.6 percent of the total of the age group 31-40 & 41-50). It can be interpreted from the aforesaid discussion that the respondents of middle and older aged are more conscious than of those of the early aged respondents.

Table 3.2.1: Bivariate Distribution of Hepatitis B1 (HB1) Vaccination with the Different Socio-Demographic Variables

Variable	HB1 Vaccination		Total	$\chi^2_{cal.}$ and ρ value
	No	Yes		
Age group				
≤20	550 (65.8%)	285 (34.1%)	835 (26.4%)	
21-30	565 (69.3%)	250 (30.6%)	815 (25.8%)	
31-40	218 (27.7%)	568 (72.2%)	786 (24.9%)	$\chi^2_{cal.}$ =51.66
41-50	160 (22.3%)	555 (77.6%)	715 (22.6%)	ρ =0.000
Total	1493 (13.0%)	1658 (59.0%)	3151(100.0%)	
Sex				
Female	1222 (61.1%)	778 (38.9%)	2000 (63.4%)	$\chi^2_{cal.}$ =16.86
Male	332 (28.8%)	819 (71.1%)	1151 (36.5%)	ρ =0.001
Total	1554 (49.3%)	1597 (50.6%)	3151 (100.0%)	
Occupation				
In job	236 (28.2%)	600 (71.7%)	836 (26.5%)	
Business	425 (47.7%)	465 (52.2%)	890 (28.2%)	
Agriculture	225 (69.2%)	100 (30.7%)	325 (10.3%)	$\chi^2_{cal.}$ =61.86
Labour	165 (69.3%)	73 (30.6%)	238 (7.5%)	ρ =0.000
Others	410 (47.5%)	452 (52.4%)	862 (27.3%)	
Total	1461 (46.3%)	1690 (53.6%)	3151 (100%)	
Place of Living				
Village	1325 (82.8%)	275 (17.1%)	1600 (50.7%)	$\chi^2_{cal.}$ =45.65
City	525 (33.8%)	1026 (66.1%)	1551 (49.2%)	ρ =0.000
Total	1850 (58.7%)	1301 (41.2%)	3151 (100.0%)	
Educational Status				
Literate	441 (31.7%)	950(68.2%)	1391 (44.1%)	$\chi^2_{cal.}$ =36.79
Illiterate	982 (55.7%)	778 (44.2%)	1760 (55.8%)	ρ =0.000
Total	1423 (45.1%)	1728 (54.8%)	3151 (100%)	
Sources of Drinking Water				
Polluted	765 (56.6%)	587 (43.4%)	1352 (42.9%)	$\chi^2_{cal.}$ =17.65
Unpolluted	652 (36.2%)	1147 (63.7%)	1799 (57.0%)	ρ =0.000
Total	1417 (45.0%)	1734 (55.0%)	3151(100.0%)	
Watching TV				
Yes	456 (29.1%)	1107 (70.8%)	1563 (49.6%)	$\chi^2_{cal.}$ =8.529
No	885 (55.8%)	703 (44.2%)	1588 (50.3%)	ρ =0.001
Total	1341 (42.5%)	1810 (57.4%)	3151 (100.0%)	
Access to News Paper				
Yes	396 (32.8%)	809 (67.1%)	1205 (38.2%)	$\chi^2_{cal.}$ =2.515
No	425 (21.8%)	465 (23.9%)	1946 (61.7%)	ρ =0.000
Total	821 (46.3%)	1274 (40.4%)	3151 (100%)	

Variable	HB1 Vaccination		Total	$\chi^2_{cal.}$ and ρ value
	No	Yes		
Economic Status				
High Economic Status	436 (27.2%)	1164 (72.7%)	1600 (50.7%)	
Low Economic Status	1056 (68.8%)	495 (31.9%)	1551 (49.2%)	$\chi^2_{cal.}$ =11.65
Total	1492 (47.3%)	1659 (52.6%)	3151 (100.0%)	ρ =0.000
Health Checkup				
Regular basis	131 (12.7%)	895 (87.2%)	1026 (32.5%)	$\chi^2_{cal.}$ =16.28
Irregular basis	569 (53.4%)	496 (46.5%)	1065 (33.7%)	
Don't make any health checkup	895 (84.4%)	165 (15.5%)	1060 (33.6%)	ρ =0.001
Total	1595 (50.6%)	1556 (49.3%)	3151 (100%)	

(Note: Row wise percentage has been considered)

As always it can be shown that the sex has the pivotal role in putting impact on HB vaccination. From Table 3.2.1 it can be shown that 71.1 percent of the total males are taken the HB1 vaccine where 38.9 percent of the total female respondents have taken HB1 vaccine as preventive measure.

In occupation there are five categories and among all the categories the category of the respondents of job holder has a higher percentage HB1 vaccination (71.7 percent) and it is the labour group who has the less HB1 vaccination (30.6 percent). The result could be interpreted as, since the job holders have a higher educational enrollment and also they are more accessed to the mass and electronic media and other modern technological accessories to gather the varieties of information, they have the more awareness and consciousness than of those of the other categories of respondent who have comparatively lower educational enrollment (Table 3.2.1).

Place of living has also play the significant role in defining the selected dependent variable. It has been assessed that 66.1 percent of the total urban respondents have taken HB1 vaccine than of those of the rural respondents among whom only 17.1 percent have got HB1 vaccine. From the general perspective it can be said that the urban population get more facilities in terms of having more informative devices than of those who belong to the rural area. This makes the urban population more conscious and always they keep themselves up to date in terms of having the habit of gathering more knowledge and information regarding the preventive procedure from the pandemic (Table 3.2.1).

As it can be seen from Table 3.2.1 that educational attainment has played a pivotal role in the case of HB1 vaccination. It has been observed that 68.2% of the total literate people use to take the HB1 vaccine whereas among the illiterate people 55.7% respondents are not used to take the vaccine as the preventive measure. This happen because an educated people has the idea about the pandemic of HB1 and has also the knowledge and consciousness regarding the prevention procedure of the disease than that of the illiterate people who are not so well informed about the preventive measures.

Here (Table 3.2.1) it can be stated that sources of drinking water has the significant effect on HB1 vaccination. It is interpreted as the respondents who used to take the protected drinking water among those 63.7 percent take the HB1 vaccine as the protected measure for the pandemic. From the above discussion it can be disclosed that the respondents who have the habit of having the protected water are more aware to keep themselves away from the HB1 and thus it can be said that they are more conscious and aware than of those who don't have the habit of taking unprotected water (43.4 percent).

The variables tagged as Watching TV has the significant impact on making people conscious and aware in terms of taking HB1 vaccine. Here from Table 3.2.1 it can be seen that an amount of 70.8 percent of the total respondents who have the tendency to watch TV have the tendency of taking HB1 vaccine than of those who haven't any attachment to electronic media (44.2 percent). The interpretation could be stated as the respondents who use to watch TV can be able to gather information in connection of different pandemic diseases like Hepatitis B1 by the process of getting the knowledge how the pandemic could be protected.

It has been observed that the respondents with having the higher economic status have more tendency of taking HB1 vaccine (72.7 percent) than of those who are the respondents with lower economical status (31.9 percent). Higher income holder can easily access with many informative sources from where they could get verities of preventive related skills and knowledge regarding the security measure of getting away from different types of diseases (Table 3.2.1).

Regular health checkup makes a person away from different types of diseases. It has also been found from the above table that the respondents who used to take the regular medical checkup are more likely to take the HB1 vaccine (87.2 percent) as the doctor always prescribe to take verities of vaccine to protect their patients from different types of vulnerable diseases. But the respondents who don't meet doctor for their routine check up at irregular and meet doctor at an irregular basis use to take HB1 vaccine at a rate of 46.5 percent & 15.5 percent respectively (Table 3.2.1).

3.3 Selected Socio-Demographic Variables' Differentials with the Habit of Using Condom at the Time of Sexual Intercourse

The following Table 3.3.1 represents the bivariate distribution of the different Socio-Demographic Variables with "Use Condom at the Time of Sexual Intercourse". Here it is seen that among the respondents of age group <20, 77.8 percent don't have the habit of using condom at the time of sexual intercourse. It has also been noticed that among all the age group, majority of the respondents belonging to the age group of 21-30 have the tendency of using condom at the time of sexual intercourse. Again the respondents of the age group of 41-50 have the lower tendency of using condom (20.5 percent) among all the respondents of all other age group holder.

As far as the gender factor is concerned it is being seen that females are not used to use the female condom at the time of sexual intercourse. On the other hand among the male 71.1 percent persons have the habit of using condom at the moment of sexual intercourse. Here it can be interpreted as the males are more conscious in terms of gathering the information regarding the prevention procedure about HIV/AIDS by using condom as the security measure at the time of sexual intercourse (Table 3.3.1).

Table 3.3.1: Bivariate Distribution of the Respondents Used to Use Condom at the Time of Sexual Intercourse with the Different Socio-Demographic Variables

Variable	Use Condom at the Time of Sexual Intercourse		Total	$\chi^2_{cal.}$ and ρ value
	No	Yes		
Age group				
≤20	650 (77.8%)	185 (22.1%)	835 (26.4%)	
21-30	389 (47.7%)	426 (52.6%)	815 (25.8%)	
31-40	415 (52.7%)	371 (47.2%)	786 (24.9%)	$\chi^2_{cal.}$ =59.3
41-50	568 (79.4%)	147 (20.5%)	715 (22.6%)	ρ =.000
Total	2022 (64.1%)	1129 (35.8%)	3151(100.0%)	
Sex				
Female	1525 (76.2%)	475 (23.7%)	2000 (63.4%)	$\chi^2_{cal.}$ =17.6
Male	332 (28.8%)	819 (71.1%)	1151 (36.5%)	ρ =.001
Total	1554 (49.3%)	1597 (50.6%)	3151 (100.0%)	
Occupation				
In job	135 (16.1%)	701 (83.8%)	836 (26.5%)	
Business	365 (41.0%)	525 (58.9%)	890 (28.2%)	
Agriculture	85 (26.1%)	240 (73.8%)	325 (10.3%)	$\chi^2_{cal.}$ =16.4
Labour	175 (73.5%)	63 (26.4%)	238 (7.5%)	ρ =.000
Others	475 (55.1%)	387 (44.8%)	862 (27.3%)	
Total	1235 (46.3%)	1916 (53.6%)	3151 (100%)	
Place of Living				
Village	1325 (82.8%)	275 (17.1%)	1600 (50.77%)	$\chi^2_{cal.}$ =19.2
Urban	636 (41.0%)	915 (58.9%)	1551 (49.2%)	ρ =.000
Total	1961 (62.2%)	1190 37.7%)	3151 (100%)	
Educational Status				
Literate	340 (24.4%)	1051(75.5%)	1391 (44.1%)	$\chi^2_{cal.}$ =36.79
Illiterate	1200 (68.1%)	560 (31.8%)	1760 (55.8%)	ρ =0.000
Total	1540 (48.8%)	1611 (51.1%)	3151 (100%)	
Heard the Name of HIV/AIDS				
Yes	527 (38.9%)	825 (61.0%)	1352(42.9%)	$\chi^2_{cal.}$ =19.9
No	988 (54.9%)	811 (45.0%)	1799 (57.0%)	ρ =0.000
Total	1515 (48.0%)	1636 (51.9%)	3151(100.0%)	
How HIV/AIDS can be Prevented?				
HIV/AIDS is Transmitted through Using Same Needle				
Yes	350 (29.0%)	855 (70.9%)	1205 (38.2%)	$\chi^2_{cal.}$ =18.5
No	1626 (86.5%)	320 (16.4%)	1946 (61.7%)	ρ =0.000
Total	1976 (62.7%)	1175 (37.2%)	3151 (100%)	
HIV/AIDS is Transmitted through the Affected Mother's Breast Milk				
Yes	568 (35.5%)	1032 (64.5%)	1600 (50.77%)	$\chi^2_{cal.}$ =22.0
No	1056 (68.0%)	495 (31.9%)	1551 (49.2%)	ρ =.000
Total	1527 (48.4%)	1624 (51.5%)	3151 (100.0%)	

Variable	Use Condom at the Time of Sexual Intercourse		Total	$\chi^2_{cal.}$ and ρ value
	No	Yes		
Which one of the Following is Relevant to the Prevalence of HIV/AIDS?				
HIV is Transmitted through Taking Food from the HIV Infected Person's Plate				
Yes	895 (87.2%)	131 (12.7%)	1026(32.5%)	$\chi^2_{cal.}$ =16.2
No	369 (17.3%)	1756 (82.6%)	2125(67.4%)	ρ =0.000
Total	1264 (40.1%)	1887(59.8%)	3151(100%)	
HIV is Transmitted through Taking Wearing Infected Person's Cloths				$\chi^2_{cal.}$ =19.6
Yes	795(77.4%)	231(22.5%)	1026(32.5%)	ρ =0.000
No	465(21.8%)	1660(78.1%)	2125(67.4%)	
Total	1260(39.9%)	1891(60.0%)	3151(100%)	

Again the occupation has the significant effect on the variable titled "Use Condom at the time of Sexual Intercourse". Among all the occupational categories it has been seen that 83.8 percent job holders used to use condom where on the other hand it has been seen that the 73.5 percent labours haven't have the habit of using condom. So, it is the job holder who are generally more educationally sound to gather more consciousness oriented knowledge than of the other occupational categories (Table 3.3.1).

Urban people are generally more up to date than of those who belong to the rural area. From our study it has been found that it is the urban people who are the majority (58.9 percent) to use condom at the time of sexual intercourse comparing to the respondents who used to stay in the rural area (17.1 percent) (Table 3.3.1).

Here also it has been found that most of the literate people use condom at the time of sexual intercourse (75.5%) than that of the illiterates (31.8%) (Table 3.3.1).

It can be reflected that the respondents who are familiar to the term HIV/AIDS most of them (61 percent) use condom at the time of sexual intercourse on the other hand 38.9 percent of those who are not familiar to the name of HIV/AIDS use condom as their security measure. From this finding it can be noted that the

respondents who have the information about HIV/AIDS are more aware regarding the process of prevalence of this pandemic than of other counterpart (Table 3.3.1).

To get information regarding the preventive knowledge of the studied population it has been found that the respondents who know the matter of prevailing HIV/AIDS through used needle are 70.9 percent conscious as they protect themselves from the prevalence of HIV/AIDS by using condom. So the respondents who have gathered the mode of transmission of HIV/AIDS are naturally more conscious than of others. Since the people who will have more information regarding the prevalence procedure, mode of transmission and like will be more aware and conscious. So it is the knowledge about the pandemic that could keep away from the prevalence of the pandemic (Table 3.3.1).

Again it has been found that the respondents who responded as HIV/AIDS could be transmitted by feeding the affected mother's breast milk are 64.5 percent more likely to use condom as their security measure. Here it also been reflected that the respondents have more information regarding the mode of transmission have more knowledge regarding the preventive measure and are more conscious about the pandemic (Table 3.3.1).

Again some confusing questions have been put on to get the idea about the depth of the knowledge of the respondents regarding the prevalence of HIV/AIDS. Here it has been found that the respondents who have shown the positive attitude to the matter of prevalence of HIV/AIDS through the process of taking food from the infected people's plate are wrongly informed and that's why those respondents are lees in number who use the protected measure (12.7 percent) (Table 3.3.1).

Chapter Four

Factors Affecting Knowledge & Consciousness about HIV/AIDS & Hepatitis B1 (HB1): An Application of Logistic Regression

4.1 Introduction

The logistic regression analysis is one of the most important methods for the successful application to epidemiological research. This method is very useful for identifying various risk factors in case of qualitative (dichotomous) out come variables. For binary data, regression methods are used as the logistic regression model. This model is first developed by Cox (1970) and the further development of the regression model is made by Anderson (1979, 83). Prentice (1976) provided a very important discussion about logistic models often used when the response variable is binary in nature. The parameters of this model are estimated by the maximum likelihood method and the confidence interval is generally estimated from the inverse of the information matrix. This chapter introduces one of the popular statistical analysis named Logistic Regression Analysis to identify the effects of various explanatory variables to the different selected dependent variables.

4.2 Variable Selection for the Model

To apply the logistic regression model, we need to re-code of explanatory variables. For the sake of making our analysis more reliable and understandable it is indispensable to get an idea about the coding of the selected predictor variables. For the availability of data we consider two linear logistic regression models. To fit the logistic regression model we select most important explanatory variables which are significantly associated with the dependent variables that were shown in chapter three. The dependent variable for model no. 1is Use Condom at the time

of Sexual Intercourse and model no. 2 is HB Vaccination. For both the models the explanatory variables are same. The categories of the dependent and explanatory variables are mentioned in the following table:

Table 4.2.1: List of Dependent and Explanatory Variables with Category for Logistic Regression Model

Model No.	Dependent Variables (Y)	Explanatory variables (X)
Model No.- 1	**1.Use Condom at the Time of Sexual Intercourse** **(For model No.-1)** **Category:** (Yes = 1 and No =0)	**a) Age of the diabetes patients.** **Category: Age (Category:** ≤20 = 1, 21-30 =2, 31-40 = 3 and 41-50 = 4 **b) Educational Status** **Category:** Literate = 1and Illiterate = 0 **c) Occupation of the Respondents** **Category:** In Job = 1, Business = 2, Agriculture = 3, Labour = 4 and Others = 5 **d) Watching TV** **Category:** Yes = 1 and No = 0 **e) Economic Status** **Category:** High Economic Status = 1 and Low Economic Status = 0 **f) Place of Residence** **Category:** City =1and Village= 0 **g) Sources of Drinking Water** **Category:** Unpolluted = 1 and Polluted = 0 **h) Access to Newspaper** **Category:** Yes = 1 and No = 0
Model No.-2	**2. Hepatitis B Vaccination** **(For model No.-2)** **Category:** (Yes = 1 and No =0)	

4.3 Factors Affecting in Reducing the Chances of the Prevalence of HIV/AIDS by Using Condom

The following Table 4.3.1 represents the effects of various explanatory variables to our first dependent variable "Use Condom at the Time of Sexual Intercourse" where, regression co-efficient with there corresponding significance level and the odds ratios are revealed.

Here the age category of 21-30 is considered as the reference category. With respect to the reference category it can be noticed that the respondents of the age category of 31-40 and 41-50 are 1.36 and 2.56 times more habituated to use condom than the reference category. So, it is the age group of <20 years of age who are more exposed to the risk of getting the HIV/AIDS than the other categories as they are less likely to use condom as the preventive measure (Table 4.3.1).

As far as the occupational category is concerned it can be stated that the respondents who are the job holders who are more frequent to use condom than other categories as the odds ratio of the other occupational categories are 0.85, 0.35, 0.2 and 0.52 for the occupational categories of business, agriculture, labour and others respectively. Here among the occupational categories the business group and the others group have the significant impact on the respective dependent variable (Table 4.3.1).

Contribution of the mass media in accessing knowledge and awareness of the people is undoubtedly extraordinary. Here also from Table 4.3.1 it is amplified that the respondents who responded as they used to watch TV at a regular basis are 3.69 times more conscious about the prevalence procedure of HIV/AIDS than those who don't have the habit of watching TV in connection of gathering varieties of information to be conscious. It has also the significant effect on the respective dependent variable.

Table 4.3.1: Logistic Regression for the Effects of Selected Independent Variables on Reducing Chance of HIV/AIDS by Using Condom at the Time of Sexual Intercourse

Characteristics	Coefficient (β)	S.E of estimates (β)	ρ Values	Relative risk (Odd ratio)
Age				
<20	-0.689	0.384	0.073*	0.36
21-30 (RC)	.....	.....	.....	1.000
31-40	0.517	0.589	0.256	1.36
41-50	0.317	0.267	0.235	2.56
Educational Status				
Illiterate (RC)	.....	.....	.....	1.000
Literate	0.336	0.216	0.120	3.695
Occupation				
In Job	.....	.....	.....	1.000
Business	0.567	0.226	0.008**	0.85
Agriculture	-0.236	0.56	0.589	0.35
Labour	-0.390	0.423	0.356	0.2
Others	-0.52	0.213	0.036***	0.52
Watching TV				
NO (RC)	.....	.....	.....	1.000
Yes	0.683	0.217	0.002***	3.695
Economic Status				
High Economic Status (RC)	.....	.....	.....	1.000
Low Economic Status	-0.258	0.310	0.405	0.773
Place of Living				
Urban (RC)	.....	.....	.....	1.000
Rural	-0.593	0.271	0.029**	0.809
Sources of Drinking Water				
Unprotected (RC)	.....	.....	.....	1.000
Protected	0.286	0.208	0.168	1.332
Access to Newspaper				
No (RC)	.....	.....	.....	1.000
Yes	0.375	0.378	0.322	1.454
Constant	-1.533	0.348	0.000	0.216
	-2 Log likelihood = 720.622			
	R Square = 0.80			

Note: (***ρ<0.01, **ρ<o.o5, *ρ<0.1)

Urban is the place where people used to get more facilities through availing those they become more aware. From Table 4.3.1 it has been detected that the urban people are more aware in terms of having more habit of using condom for keeping themselves way from HIV/AIDS that of the counter part of the respondents who belong to some rural place (0.809 times more likely to use condom than the reference category).

4.3.1 R^2 in the Logistic Regression

For the above fitted model the Cox and Snell $R^2 = 0.80$ and the Negelkereke $\overline{R}^2 = 0.70$. It is observe that when the value of $\overline{R}^2$ is exceeds 0.5 the data fit the binary logistics regression model well. Therefore the model can be used for

prediction of significant effect of selected independent variables on reducing chance of HIV/AIDS by using condom at the time of sexual intercourse.

4.3.2 Correct Classification Rate (CCR)

Further we will use the correct classification rate (CCR) as a measure of the fit of the logistic regression model. In order to find the CCR we have the following tables.

Table 4.3.2.1: Observed Classification Table [a, b]

Use Condom at the time of Sexual Intercourse		Predicted		Percentage Correct
		No	Yes	
Observed	No	713	7	95
	Yes	264	13	5.0
	Overall Percentage			87.0

a. Constant is included in the model

b. The cut value is 0.5

Table 4.3.2.2: Predicted Classification Table [a]

Use Condom at the time of Sexual Intercourse		Predicted		Percentage Correct
		No	Yes	
Observed	No	867	0	100
	Yes	123	7	5.4
	Overall Percentage			87.7

a. The cut value is 0.5

If we use 0.5 cut as the threshold or cut value, we have from Table 4.3.2.2, CCR = 0.88. Since a model that affords better classification performance should be judged superior by a goodness-of-fit test that indirectly assesses the classification performance of the model. Through classification performance we conclude that our fitted model may be used for prediction.

4.4 Factors Affecting in Reducing the Chances of the Prevalence of Hepatitis B1 (HB1) by Adopting HB1 Vaccine

Table 4.4.1 represents the differential patterns of the different variables to the selected dependent variables titled "Hepatitis B1 Vaccination" with the selected odds ratio.

Here from the table it has been found that the age categories of 31-40 and 41-50 contain more odds ratio (i.e., 3.56 and 2.56 respectively) than the other categories. So, those two categories' respondents are more used to use hepatitis B vaccination than the reference categories. From this finding it could be interpreted that the middle aged population are more conscious than the categorical respondents belong to the age category of <20 and 21-30 years in the case of having the HB1 vaccination (Table 4.4.1).

Evidence has been found that watching TV provides more information regarding any aspects which has a greater impact on the storage of knowledge. Here from Table 4.4 the respondents who have the more access to TV have the more level of consciousness (3.695 times) than that of the respondents who don't have the access to TV. This variable has also the significant contribution to the respective dependent variable (Table 4.4.1).

Table 4.4.1: Logistic Regression for the Effects of Selected Independent Variables on Reducing Chance of the Prevalence of Hepatitis B1 through HB1 Vaccination

Characteristics	Coefficient (β)	S.E of estimates (β)	ρ Values	Relative risk (Odd ratio)
Age				
<20	-0.365	0.561	0.032***	0.563
21-30 (RC)	.....	.....	.....	1.000
31-40	0.563	0.698	0.045*	3.561
41-50	0.653	0.2365	0.0236	2.563
Educational Status				
Illiterate (RC)	.....	.....	.....	1.000
Literate	0.556	0.298	0.165	2.695
Occupation				
In Job	.....	.....	.....	1.000
Business	-0.256	0.563	0.035	0.632
Agriculture	-0.563	0.523	0.025	0.523
Labour	-0.254	0.563	0.025	0.563
Others	-0.563	0.653	0.0256	0.356
Watching TV				
NO (RC)	.....	.....	.....	1.000
Yes	0.683	0.217	0.002***	3.695
Economic Status				
High Economic Status (RC)	.....	.....	.....	1.000
Low Economic Status	-0.365	0.385	0.405	0.556
Place of Living				
Urban (RC)	.....	.....	.....	1.000
Rural	-0.593	0.456	0.039**	0.309
Sources of Drinking Water				
Unprotected (RC)	.....	.....	.....	1.000
Protected	0.365	0.456	0.168	1.653
Access to Newspaper				
No (RC)	.....	.....	.....	1.000
Yes	0.457	0.412	0.236	1.657
Constant	-1.533	0.348	0.000	0.216
	-2 Log likelihood = 720.622			
	R Square = 0.76			

Note: (***ρ<0.01, **ρ<o.o5, *ρ<0.1)

Urban people are more facilitate to have several types of information from different sources than of those people who belong to rural place. It has been amplified that rural people are 0.809 times more likely to have the latest information in connection of being conscious by taking HB vaccine to get away from the pandemic of hepatitis B than of those who lives in the urban place (Table 4.4.1).

The people who used to take the unpolluted water have the more consciousness level regarding the HB1 vaccination than of those who are used to take the polluted water (Table 4.4.1).

4.4.1 R^2 in the Logistic Regression

For the above fitted model the Cox and Snell $R^2 = 0.76$ and the Negelkereke $\overline{R}^2 = 0.65$. It is observe that when the value of $\overline{R}^2$ is exceeds 0.5 the data fit the binary logistics regression model well. Therefore the model can be used for prediction of the significant effect of selected independent variables on reducing the chances of the prevalence of Hepatitis B1 (HB1) by adopting HB1 vaccine.

4.4.2 Correct Classification Rate (CCR)

Furthermore we will use the Correct Classification Rate CCR as a measure of the fit of the model. In order to find the CCR we have the following tables.

Table 4.4.2.1: Observed Classification Table [a, b]

Habit of Taking HB Vaccination		Predicted		Percentage Correct
		No	Yes	
Observed	No	720	21	95
	Yes	277	10	5.0
	Overall Percentage			84.3

a. Constant is included in the model

b. The cut value is 0.5

Table 4.4.2.2: Predicted Classification Table [a]

Habit of Taking HB Vaccination		Predicted		Percentage Correct
		No	Yes	
Observed	No	867	0	100
	Yes	123	7	5.4
	Overall Percentage			86.6

a. The cut value is 0.5

If we use 0.5 cut as the threshold or cut value, we have from Table 4.4.2.2, CCR = 0.87. Since a model that affords better classification performance should be judged superior by a goodness-of-fit test that indirectly assesses the classification performance of the model. Through classification performance we conclude that our fitted model may be used for prediction.

Chapter Five

The Interaction Effects of the Factors Influencing Knowledge and Consciousness of the Sample Population

5.1 Introduction

In this study, tabular system of data along with the linear probability models were used to predict the condition of infectious diseases and to identify the impact of influential factors that affect knowledge and consciousness about the infectious diseases (Here two most vulnerable infectious diseases are considered; one is HIV/AIDS and other is Hepatitis B) of the sample people.

5.2 Selection of Variables for Linear Probability Model for HIV/AIDS

Let us consider a simple model

$$Y_i = \beta_1 + \beta_2 X_i + u_i \quad \text{.....(1)}$$

Where, X_i are the explanatory variables, Y=1 when respondents use condom at the time of intercourse, Y=0, otherwise.

This model expresses the dichotomous Y_i as a linear function of the explanatory variables X_i and is called liner probability model. Now the conditional expectation of Y_i given X_i can be interpreted as the conditional probability that the event will occur given X_i, that is, $\Pr(Y_i = 1/X_i)$.

Assuming $E(u_i)=0$, to find an unbiased estimator we obtained $E(Y_i/X_i) = \beta_1 + \beta_2 X_i$. Now letting P_i probability that $Y_i = 1$ (the event occurs) and 1- P_i= probability that $Y_i = 0$ (the event does not occur), the variable Y_i has the following distribution:

Y_i	Probability
0	$1-P_i$
1	P_i
Total	1

Now by the definition of mathematical expectation we obtain

$$E(Y_i) = 0(1-P_i) + 1(P_i).$$

Thus we can write the conditional expectation as probability, that is, $E(Y_i / X_i) = \beta_1 + \beta_2 X_1 = P_i$. Since the probability P_i must be lied between 0 and 1. We have the restriction, $0 \le E(Y_i / X_i) \le 1$, that is the conditional expectation or conditional probability must lie between 0 and 1.

The general expression of the linear probability model (LPM) is

$$Y = \beta_1 + \beta_2 X_1 + A + \beta_{k+1} X_k + u \quad \text{.....(2)}$$

Where Y equal to 1 or 0 according as if respondents use condom at the time of the sexual intercourse or otherwise and X_i's are the explanatory variables like respondents' education, respondents' income, place of residence, watching TV (Television) and other relevant factors.

5.2.1 Result and Discussion

Here to fit the Linear Probability Model (LPM) we selected the following variables which are most significantly associated that have been found in Chapter Three. To predict the final say on use of condom as a security measurement for the respondents, a linear probability model has been fit. A set of independent and dependent variables are defined as:

$$R_i = \begin{Bmatrix} \text{yes, respondents use condom at the time sexual intercourse} \\ 0, \text{otherwise} \end{Bmatrix}$$

$$E_i = \begin{Bmatrix} 1, \text{respondent is literate} \\ 0, \text{otherwise} \end{Bmatrix}$$

$$WT_i = \begin{Bmatrix} 1, \text{If the respondent watches TV} \\ 0, \text{otherwise} \end{Bmatrix}$$

$$WI_i = \begin{Bmatrix} 1, \text{if the respondent is rich} \\ 0, \text{otherwise} \end{Bmatrix}$$

$$PR_i = \begin{Bmatrix} 1, \text{if the respondent lives in the urban area} \\ 0, \text{otherwise} \end{Bmatrix}$$

The fitted linear probability model is disclosed to predict final say on "Use Condom at the Time of Sexual Intercourse" for the eligible respondents. The model is represented below:

$$R_i = \{0.126E_i + 0.126WT_i\} \quad \text{.....(1)}$$

SE = (0.012) (0.014)
t = (11.124) (11.122)
ρ = (0.000) (0.000)

The linear probability model for explaining respondent's habit of watching TV is as below:

$$WT_i = 0.247WI_i + 0.203PR_i + 0.092E_i \} \quad \text{.....(2)}$$

SE = (0.012) (0.010) (0.012)
t= (22.062) (18.428) (8.569)
ρ = (0.000) (0.000) (0.000)

Similarly the linear probability model for explaining respondents' education can be fitted as

$$E_i = 0.191WI_i + 0.27PR_i \quad \text{.....(3)}$$

SE = (0.011) (0.009)
t = (16.295) (2.318)
ρ = (0.000) (0.002)

Here evidently R_i can be explained by E_i as respondent's consciousness level has been explained by respondent's educational level. Again, WT_i refers respondent's habit of watching TV through which the consciousness level can be explained. Here, it is noticed that respondent's consciousness about the contamination of HIV/AIDS is affected by both educational attainment and the habit of watching TV as through the proper education a person could notch up the invariable information about the pandemic and through the proper channel of information by the electronic media like TV a person can be able to rich his or her bank of knowledge regarding consciousness about HIV/AIDS.

From equation (1), it can be seen that the coefficient of educational status is positive and respondent's habit of watching TV is also positive. That means with increasing educational attainment as well as the habit of watching TV, the consciousness level about HIV/AIDS is raised. It can be mentioned that with 10 percent increasing in the respondent's educational attainment, the consciousness level is raised by 1.26 percent. However, 10 percent increasing in the habit of watching TV can increase the consciousness about HIV/AIDS by 1.26 percent.

It has been found from equation (2) that the respondent's income, place of residence and educational attainment play the pivotal role in explaining the habit of watching TV. With 10 percent augmentation of respondent's income, the probability of watching TV is also raised by 2.4 percent and 10 percent swelling in the respondent's place of residence is eligible for making an escalating in the probability of watching TV. Here, the result implies that the electronic media which is one of the vital sources of knowledge about HIV/AIDS could only be afforded by those who have a certain growth in the level of education and of those who have comparatively a better place of residence (i.e., those who live in urban area).

Furthermore, from equation (3) it could be said that the respondent's income and the place of residence put high and significant influence on educational attainment of the respondents. That is, the respondents who have the high level of income and those who have a higher status of living have the higher probability to enroll in the

higher level of education. From equation 3 it is clear that for 10 percent raising in respondent's income and 10 percent improvement in the place of residence a better educational background which is essential for gathering the informative news about the infectious diseases like HIV/AIDS is ensured.

So, thorough the three equations of linear probability model it has been clear that education, income, and living status are the most important and significant factors those positively affect consciousness level about HIV/AIDS. So, it is obligatory to improve the educational attainment which brings the opportunity to live in the upgraded conscious zone.

From equation (2) and (3) it can be revealed as:

$$WT_i = 0.247WI_i + 0.203PR_i + 0.092E_i$$
$$\triangleright WT_i = 0.247WI_i + 0.203PR_i + 0.092(0.191WI_i + 0.27PR_i)$$
$$\triangleright WT_i = 0.247WI_i + 0.203PR_i + 0.0174WI_i + 0.0248PRi$$
$$\triangleright WT_i = 0.467WI_i + 0.227PR_i \quad \text{.....(4)}$$

From equation (4) it is clear that the habit of watching TV is highly depended on income, place of residence and educational attainment. This educational attainment leads a person to avail a good place of residence. That is, a person who will have a better income with having a better place of residence will be facilitated by the habit of having the latest news and views about any infectious diseases.

Again, from the equation (1), (3) and (4) we can solve the following equation:

$$R_i = 0.126E_i + 0.126WT_i$$
$$\triangleright R_i = 0.126(0.19WI_i + 0.027PR_i) + 0.126(0.467WI_i + 0.227PR_i)$$
$$\triangleright R_i = (0.023WI_i + 0.0034PR_i + 0.0588WI_i + 0.028PR_i)$$
$$\triangleright R_i = (0.0818WI_i + 0.0321PR_i) \quad \text{.....(5)}$$

From (5) number equation it is clear that income and place of residence have a pivotal contribution to increase the conscious level about HIV/AIDS. It is quite clear that with the improvement in income and having been an urban resident a person could be able to know different important information regarding various diseases through exploring verities of information as electronic media, mass media, internet and like. So, through the process of acquiring a higher level of

education, increasing income and staying in urban area a person could be more conscious. Here the rural people become the victim of not having the sufficient amount of sources of knowledge. In this connection different GOs' and NGOs' are supposed to work together to provide verities of necessary information to the grass root people.

5.3 Selection of Variables for Linear Probability Model for Hepatitis B1 Virus

Let us consider a simple model

$$Y_i = \beta_1 + \beta_2 X_1 + u_i \quad \text{.....(6)}$$

Where, X is explanatory variables, Y=1when respondents receive Hepatitis B1 vaccine, Y=0 otherwise.

So, in the same way the general expression of the linear probability model (LPM) is

$$Y = \beta_1 + \beta_2 X_1 + A + \beta_{k+1} X_k + u \quad \text{.....(7)}$$

Where, Y equal to 1 or 0 accordingly as if respondents take the HB1 vaccine or otherwise and X_i's are the explanatory variables like sources of drinking water, education, respondent's income, place of residence, watching TV and other relevant factors.

5.3.1 Result and Discussion

Here to fit the Linear Probability Model (LPM) we selected the following variables which are most significantly associated that have been found in Chapter Three. To predict the final say on the HB1 Vaccination as the security measure for the respondents a linear probability model has been fit. A set of independent and dependent variables were defined as:

$$R_i = \begin{Bmatrix} 1 = \text{yes, respondent takes HB1 vaccine} \\ 0, \text{otherwise} \end{Bmatrix}$$

$$SDW_i = \begin{Bmatrix} 1, \text{If the respondent takes protected drinking water} \\ 0, \text{otherwise} \end{Bmatrix}$$

$$WT_i = \begin{Bmatrix} 1, \text{If the respondent watches TV} \\ 0, \text{otherwise} \end{Bmatrix}$$

$$WI_i = \begin{Bmatrix} 1, \text{If the respondent has a sound economic background} \\ 0, \text{otherwise} \end{Bmatrix}$$

$$ED_i = \begin{Bmatrix} 1, \text{If the respondent is literate} \\ 0, \text{otherwise} \end{Bmatrix}$$

The fitted linear probability model is to predict "Final say on the respondent's habit of taking HB1 vaccine" for eligible respondents is:

$$\left.\begin{array}{l} \text{Re}_i = 0.132SD_i + 0.097ED_i \\ \text{SE} = (0.044) \quad (0.036) \\ \text{t} = (60260) \quad (4.613) \\ \rho = (0.000) \quad (0.000) \end{array}\right\} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (8)$$

The linear probability model for explaining respondent's habit of taking protected drinking water

$$\left.\begin{array}{l} SDW_i = 0.1177WI_i + 0.061WT_i + 0.016Ed_i \\ SE = (0.018)\ (0.017)\ \ (0.018) \\ t = (5.015)\ (2.601)\ \ (0.745) \\ p = (0.00)\ (0.00)\ \ (0.000) \end{array}\right\} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (9)$$

Similarly the linear probability model for explaining respondents' education can be fitted as:

$$\left.\begin{array}{l} Ed_i = 0.162WI_i + 0.137WT_i \\ \text{SE} = (0.021) \quad (0.021) \\ \text{t} = (7.156) \quad (6.058) \\ \rho = (0.000) \quad (0.000) \end{array}\right\} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (10)$$

Here evidently Re_i refers to the habit of receiving HB1 vaccine can be explained by Ed_i as respondent's consciousness level has been explained by the respondent's educational level. Again, SDW_i refers the quality of respondents' drinking water which also affect the tendency of taking HB1 vaccine. Here, it is noticed that the respondent's consciousness about the contamination of HB1 is furnished by both educational attainment and the habit of watching TV as through the proper education a person could notch up the invariable information about the pandemic and through the proper channel of information by the electronic media as TV a person can also be able to rich his bank of information.

From equation (8), it can be seen that the coefficient of the sources of drinking water and educational attainment are positive. That means with the habit of taking protected drinking water as well as with the higher educational enrollment the consciousness of the sample population level about HB1 is enhanced. It can be mentioned that with 10 percent hike in the respondent's habit of taking protected water, the habit of taking HB1 vaccine could also be increased by 1.32 percent. However, with 10 percent addition in the educational attainment the probability of taking HB1 vaccine which is effective protection measurement in terms of keeping oneself free from HB1 is increased by 0.97 percent.

It has also been found that respondent's income, habit of watching TV and educational attainment play important role in explaining the habit of taking the protected drinking water. From (9) no. equation it is seen that with 10 percent strengthen in respondent's income, the probability of taking protected drinking water is increased by 1.17%. Again, 10 percent rise in the habit of watching TV is eligible for making an augmentation over the probability of growing the habit of taking protected drinking water. It has also been noticed that with 10 percent increasing in educational attainment the probability of taking fresh drinking water is increased. Here, the result implies that with the advancement in income, education and the habit of watching TV there is a higher probability of taking protected water.

Furthermore from equation (10) the respondent's income and the habit of watching TV also have an impact on the respondent's educational attainment. With the advancement in income and watching TV a respondent can be able to enhance his educational attainment. From this analysis it has been found that with the 10% augmentation in income, the probability of having a higher educational background is increased by 1.6 percent. On the other hand, with the addition in the habit of watching TV, the educational attainment is also enhanced by 1.3 percent and all these variables have the significant impact on the respective depended variables.

So, through the three equations of linear probability model it has been clear that education, income, sources of drinking water and habit of watching TV are the most important and most significant factors those affect the habit of taking HB1 vaccine. So, it is required to improve the educational attainment which brings the opportunities of higher income which also prefer the opportunity to make an enhancement in consciousness level in terms of taking HB1 vaccine.

From equation (9) and (10) we have:

$$SDW_i = 0.117WI_i + 0.061WT_i + 0.016Ed_i$$

$$\triangleright\ SDW_i = 0.117WI_i + 0.061WT_i + 0.016(0.162WI_i + 0.137WT_i)$$

$$\triangleright\ SDW_i = (0.117WI_i + 0.061WT_i + 0.00259WI_i + 0.00219WT_i)$$

$$\triangleright\ SDW_i = (0.11959WI_i + 0.09631WT_i) \quad \text{.....(11)}$$

Here, from equation no. (11) it has been got that the habit of taking protected water is highly influenced by the respondent's income and the habit of watching TV. Through economically high status help people to make the consciousness and through the electronic media versatile types of information could be notched up by which a person could be able to keep themselves away from the pandemic diseases.

From equation (8), (10) and (11) we have

$$\mathrm{Re}_i = 0.132SD_i + 0.097Ed_i$$

$$\triangleright\ \mathrm{Re}_i = 0.132(0.1195WI_i + 0.0096WT_i) + 0.097(0.162WI_i + 0.137WT_i)$$

$$\triangleright\ \mathrm{Re}_i = 0.015WI_i + 0.0012WT_i + 0.17WI_i + 0.013WT_i$$

$$\triangleright\ \mathrm{Re}_i = 0.186WI_i + 0.034WT_i \quad \text{.....(12)}$$

From equation (12) it has been clear that a people with high economic status and who have the habit of watching TV have the higher probability of being conscious by taking the HB1 vaccine.

Chapter Six

Conclusion and Policy Implication

6.1 Introduction

This study tried to administer the nature of extent of the knowledge and consciousness about the two most vulnerable infectious diseases; HIV/AIDS and Hepatitis B in perspective of Bangladesh and also to identify the factors affecting the knowledge and consciousness level of the people with the intensity of those effects to get rid of these two horrific pandemics.

6.2 Major Findings

In this study it has been found that age, place of residence, educational enrollment and the economical status has the significant effect to both of the diseases' knowledge oriented dependent variables (i.e., HB vaccination and Use Condom at the time of Sexual Intercourse).

Again for both of the infectious diseases it has been the access to the electronic media (i.e., Watching TV) and access to news paper has been found as the significant contributor in developing knowledge and consciousness regarding the pandemics.

Specifically for the Hepatitis B virus the sources of drinking water, health checkup and the economic status have very strong impact on the process of being informative in connection of gathering knowledge and consciousness.

In the case of HIV/AIDS the respondents who have the idea about the name of HIV/AIDS and the idea on mode of transmission of the HIV virus through different ways are more conscious in connection of the prevalence of the pandemic.

From the first part of the research attempted was made to make the bi-variate distribution with the chi-square test and mean and standard deviation measurement. It has been found that age has a significant role in the selected dependent variables of both diseases (i.e., Hepatitis B and HIV/AIDS). Here it has been reflected that in the case of HB vaccination, 77.6 percent of the respondents of age group of 41-50 have taken the HB vaccine on the other hand for HIV/AIDS the majority of more than 52 percent respondents of the age group of 21-30 use condom as their security measure. So, it can be concluded that to protect from Hepatitis B the respondents of age group of 41-50 are more conscious and in the other hand the respondents of age group 21-30 are more aware in keeping themselves away from HIV/AIDS by using condom at the time of sexual intercourse.

As far as the occupational category is concerned it has been found that for both of the diseases the job holders are the mostly aware in terms of taking HB vaccine and using condom for protecting themselves from hepatitis B and HIV/AIDS respectively (71.7 percent job holders has taken HB vaccine and 83.8 percent job holders use condom at the time of sexual intercourse).

From the logistic analysis for HIV/AIDS, it has been found that the respondents of the age group 41-50 are 2.56 times more conscious than the reference category (i.e., age group of 21-30 years.). So far as the occupational category is concerned it has been got that with respect to the job holders the rest of the occupational categories have less odds ratio (i.e., for business, agriculture, labour and others the odds ratios are 0.85, 0.35 0.2 and 0.52 respectively) in terms of the habit of using condom at the time of sexual intercourse. Again the literate persons are found 3.695 times more likely to use protective measure than that of illiterate respondents.

For the HB, the logistic regression has represented that the respondents of age group 31-40 years are more likely to get the vaccination than of the others. Again the job holders are more frequent to take the vaccination than of the other respondents with the different occupational category holder.

Through Linear Probability Model (LPM) it has been depicted that with increase of educational attainment as well as the habit of watching TV the consciousness level about HIV/AIDS is enhanced. It can be mentioned that with 10 percent increase in the respondent's educational attainment, the consciousness level could also be increased by 1.26 percent. However, 10 percent increase in the habit of watching TV can increase the consciousness about HIV/AIDS by 1.26 percent which is same as the probability of the increment of educational attainment.

As far as the place of living is concerned it can be stated that in the case of hepatitis B, 66.1 percent and on the other hand for HIV/AIDS around 58 percent urban living people have been determined as the conscious in terms of taking the protected measure through taking vaccination and condom for HB and HIV/AIDS respectively. .

Here the summarized overview of the knowledge and consciousness oriented variables have been disclosed with respect to the respective dependent variables for both Hepatitis B and HIV/AIDS. We have observed that for the HB among the respondents who used to take the unpolluted drinking water, 63.7 percent have the tendency to take HB vaccine as their protected measure and on the other hand for HIV/AIDS 61 percent of the respondents who are familiar to the term HIV/AIDS have the habit of using condom as the protective measure. Again it ahs been seen that the respondents who have the idea about the mode of transmission of HIV/AIDS have more knowledge and consciousness in terms of using the protective measure to keep themselves away from the pandemic. Again in the case of Hepatitis B it has been seen that the respondents who have the habit of watching TV, access to print media, and have the tendency to have the regular health check-up among those 70.8 percent, 67.1 percent and 87.2 percent respectively used to take the vaccination to get the protection from the prevalence of the pandemic.

In the logistic analysis it has been depicted that for HIV/AIDS the contribution of the mass media in accessing knowledge and awareness of the people is undoubtedly undesirable. Here also from Table 4.2 it is amplified that the respondents who responded as they used to watch TV at a regular basis are 3.69

times more conscious about the prevalence procedure of HIV/AIDS than those who don't have the access to TV in connection of gathering verities of information to be conscious. Economic status has a very indispensable effect on the selected dependent variable as it is seen that the respondents holding the higher economic status has the more likelihood to use condom at the time of intercourse than of those who have comparatively lower economical status (0.77 times more likely to use condom as the preventive measure). Watching TV has a role to provide information to the educated elite people who continuously read newspaper. Our research also provides the output as the respondents who have the attachment with the daily newspaper are 1.45 times more conscious of the prevalence of HIV/AIDS than of those who don't have the access to the newspaper.

For Hepatitis B1 it has been found from the logistic regression that evidence has reflected that watching TV provides more information regarding any aspects which has a greater impact on the storage of knowledge. Here from Table 4.3 the respondents who have the more access to TV have the more level of consciousness (3.695 times) than that of the respondents who don't have the access to TV. Higher economic status holders have more awareness than those of the respondents who have the less economical status. This evidence can be interpreted as the higher economical status holder has the more access to verities informative equipment that makes the respondents more conscious. The variable named "Sources of Drinking water" has the contribution to the selected dependent variable as we have got that the respondents who get the protected drinking water are 1.6 times more likely to get the vaccination of HB than of the reference category.

The LPM method states that it has been found that for HIV/AIDS the respondent's income, place of residence and educational attainment play the pivotal role in explaining the habit of watching TV. With 10% increase of respondent's income the probability of growing habit of watching TV is also increased by 2.4 percent and 10 percent improvement in the respondent's place of residence is eligible for making an increment over the probability of growing the habit of watching TV. Here, the result implies that the electronic media which is one of the vital sources

of knowledge about HIV/AIDS could only be afforded by those who have a certain enhancement level of education and of those who have comparatively a better place of residence (i.e., those who live in urban area). From (5) number equation it is clear that income and place of residence has a very pivotal contribution increasing the conscious level about HIV/AIDS. It is quite clear that with the increase of income and having been an urban resident a person could be able to know many important information regarding various diseases through exploring verities of information as electronic media, mass media, internet and like.

For HB it reflects that by the electronic media it is possible to know the protective measure of keeping oneself away from hepatitis B1 as we can notice that those who used to watch TV are most of them (57 percent) take HB1 vaccine but in comparison with those respondents who are not used to watch TV are less in number (38.3 percent) who take the HB1 vaccine as a protection measure of HB1. With the habit of taking protected drinking water as well as with the higher educational enrollment the consciousness level about HB1 is enhanced. It can be mentioned that with 10 percent increase in the respondent's habit of taking protected water, the habit of taking HB1 vaccine could also be increased by 1.36 percent. However, with 10 percent increment in the educational attainment can also be able to increase the probability of taking HB1 vaccine which is effective protection measurement in terms of keeping oneself free from HB1 by 0.97 percent. It has also been found that respondent's income, habit of watching TV and educational attainment play pivotal role in explaining the habit of taking the protected drinking water. With 10 percent increase of respondent's income the probability of taking protected drinking water is increased by 1.17 percent. Again, 10 percent increment of the habit of watching TV is eligible for making an increment over the probability of growing the habit of taking protected drinking water. It has also been noticed that with 10 percent increment in educational attainment the probability of taking fresh drinking water is increased. Here, the result implies that with the advancement in income, education and the habit of watching TV there is a higher probability of taking protected water. From equation 12 it has been clear that a people with high economic status and who

have the habit of watching TV have the higher probability of being conscious by taking the HB1 vaccine.

6.3 Recommendations and Policy Implications

From the above study it can be concluded that the respondents of our study who have the sound educational enrollment as well as who have the higher economical status are more informative as they have the access in different print media, electronic media, internet and some other sources of information through which they can be able to be more informative. But it is alarming that the respondents who haven't have the ability to make the access to different up to date sources of information and also whose don't have the standard level of economic status are more in a vulnerable zone of affecting by these pandemic due to the lacking of information needed regarding the pandemics. So, it can be stated that the GOs' and NGOs' implacable contribution in exploring varieties of information to the grass rout people is indispensable to make our large rural based population more aware about the knowledge and consciousness about these two diseases (Leenaars *et al*, (2012)).

Hepatitis B virus (HBV) is the leading cause of chronic liver disease and liver-related death worldwide, with the majority of these cases occurring in areas of Africa and Asia where HBV prevalence is high. (Population prevalence is greater than 8 percent). Around the world, 90 percent of HIV-infected persons have biological signs of prior HBV infection (defined by the presence of serum anti-HBcAb) and 5 percent –15 percent suffer from chronic infection (defined by the presence of serum HBsAg).(Leenaars *et al*, (2012)) As a consequence, 2–4 million of the 33 million people living with HIV globally are also co-infected with chronic hepatitis B.(Leenaars *et al*, (2012)).Conditions associated with hepatitis B and C are currently among the leading causes of hospital admission and recent studies have shown increasing rates of liver disease and related death among those with HIV (Peters *et al*, (2005)).

The impact of HIV and HBV co-infection is especially apparent in regions with widespread use of highly active antiretroviral therapy (HAART).The introduction of HAART has led to the emergence of liver related disease and mortality as HBV infection increases HAART related hepatotoxicity (Peters *et al.*, (2011)).

Since the introduction of highly active antiretroviral treatment (HAART), morbidity and mortality have decreased greatly in HIV-infected individuals. The management of other non HIV associated chronic diseases in HIV patients has become increasingly important (Peters *et al.*, (2011)).

In these regard HBV co infection with HIV is becoming a major challenge. In acknowledging this problem, an international forum was convened in Jackson Hole, Wyoming in September 2006, recommending the search of treatment options for HIV and HBV co –infected patients. A key topic of conversation was the development of new agents for treating viral hepatitis in patients with HIV though Challenges including the risk of hepatic injury and low patient tolerance, which limits compliance, will accompany the upcoming treatment (Fauci *et al*, (2011)).

Despite these great upcoming challenge there is limited information regarding the prevalence of hepatitis co-infection amongst HIV positive individuals in Africa (Jernigan *et al.* (2011)).

Although hepatitis B is of immense public health importance in the World Population Research (WPR), the motivation for setting a regional hepatitis B control goal goes beyond the control of hepatitis B. When the WPR was certified poliomyelitis-free in 2000 and measles mortality declined by more than 99 percent, an urgent need was felt to strengthen routine immunization services to maintain past gains and to increase the public health impact of current and new vaccines. However, as the saying goes, "what gets monitored is what gets done": an indicator was needed to measure the performance of routine immunization services (Alter *et al.*(2011)).

The proposed hepatitis B control goal provides an outcome indicator for monitoring both the quantity (i.e. coverage) and quality of routine immunization services. While coverage with the three doses of hepatitis B vaccine will serve as the intermediate *process* indicator, documented reductions in the HBsAg seroprevalence rate will link the outcome to coverage and the quality of the immunization services. Hence, data from serosurveys could both validate official immunization coverage estimates and confirm the quality of vaccination. This prompted a review of immunization quality, including the timing of the birth dose and the incidence of vaccine freezing, which may render the vaccine impotent (Alter *et al.*(2011)).

6.4 Further Research

Every research has a research gap as this study has also got that. Considering the following suggestion the further research could be extended in this field of research associated to hepatitis B and HIV/AIDS:

Specifically it could be stated that the opportunity should be created to get the data on the hepatitis b and HIV/AIDS affected people directly to get closer about the sources of infection and by exploring those data the core research could be made to detect factors affecting the prevalence of the pandemic.

Most importantly, more comprehensive research is needed to the better understanding of the factors relevant to the development of risk reduction interventions for the prevention of the diseases and to let the people know about the risk factors those are associated with this disaster pandemic, so that they could be aware of those risky factors.

Rajshahi University Library
Documentation Section
Document No.....
Date... .....

Bibliography

American Psychological Association. (2010a). *Publication manual of the American Psychological Association* (6th ed.). Washington, DC: Author.

American Psychological Association. (2010b). Figure 2.1. Sample one-experiment paper. In *Publication Manual of the American Psychological Association* (6th ed.) (pp.41–53). Washington, DC: Author. Available from website at http://supp.apa.org/style/PM6ECorrected-sample-papers.pdf

Alonso, P.L., J. Sacaral, J.J. Aponte, et al. 2011. Efficacy of the RTS, S/AS02A Vaccine against *Plasmodium falciparum* Infection and Disease in Young African Children: Randomized Controlled Trial. *Lancet* 364:1411–20

American Psychological Association. (2012). *APA style.* www.apastyle.org/index.aspx Hopkins Press.

Al-Manarah, T.A., Peter, C.T. and Rajmina, J.A. (2009). *The Evolution and Eradication of Infectious Diseases*. Baltimore, MD: Johns

Amin, A.J. and Rafiqul, I.S. (2012). Infectious diseases – importance of co-ordinated activity in Europe; EASAC (2006) Vaccines: innovation and human, health; EASAC (2007) Tackling antibacterial resistance in Europe.

Alter, A.S. and Shamuelson, A.H. (2011); Techalew A.L. and Rober S.T. (2010). HIV and AIDS: 20 Years of Science. *Nature Medicine* 9:839–43

American Psychological Association. (2012). The basics of APA style [Tutorial]. Retrieved from http://www.apastyle.org/learn/tutorials/basics-tutorial.aspx

Centers for Disease Control and Prevention. 2010. Cases of HIV Infection and AIDS in the United States, 2009: HIV/AIDS Surveillance Report. http://www.cdc.gov/hiv/stats/2003SurveillanceReport.pdf

Cockburn, T.A. 2010. *The Evolution and Eradication of Infectious Diseases*. Baltimore, MD: Johns Hopkins Press.

Conference, November 2006 'Vaccination against infectious diseases, animal an human'. Slide sets at www.feam.eu.com for Hungary, Portugal and France.

Centers for Disease Control and Prevention. 2010. Pneumocystis Pneumonia—Los Angeles. *Morbidity and Mortality Weekly Report* 30:250–52

Centers for Disease Control and Prevention. West Nile Virus. http://www.cdc.gov/ncidod/ dvbid/westnile/index.htm. Accessed on September 8, 2010

Centers for Disease Control and Prevention. 2011. Kaposi's Sarcoma and Pneumocystis Pneumonia among Homosexual Men—New York City and California. *Morbidity and Mortality Weekly Report* 30:305–8

Chein, F.F., Devaux, I., Alix, J. and Nardone, A. (2011) HIV/AIDS in Europe: trends and EU wide priorities. Eurosurveillance at www.eurosurveillance.org/ew/2006/061123.asp

Duke University Medical Center Library. (2012). Conducting systematic reviews [Webpage]. Retrieved from http://guides.mclibrary.duke.edu/sysreview

Fauci, A.S. 2011. Infectious Diseases: Considerations for the 21st Century. *Clinical Infectious Diseases* 32:675–85.

Fix, L., Braunwald, A.S. Fauci, S.L. Hauser, D.L. Longo, and J.L. Jameson, Eds. (2011). *Harrison's Principles of Internal Medicine: Enteroviruses and Reoviruses*, page 114. New York: McGraw Hill

Garson, G. D. (2002). *Guide to writing empirical papers, theses, and dissertations*. New York: Marcel Dekker.

Gomez-Gonzalo, K.L. (2012). Factors in the Emergence of Infectious Diseases. *Emerging Infectious Diseases* 1:7–15.

Hewitt, J. (2012). ENGI 600: Template for taking research notes. Retrieved from Rice Center for Engineering website at http://rcel.rice.edu/engi600/ *Thesis Literature Review Handbook v.1* **53**

Jernigan, D.B., P.L. Raghunathan, B.P. Bell, et al. 2011. Investigation of Bioterrorism-Related Anthrax, United States, 2001: Epidemiologic Findings. *Emerging Infectious Diseases* 8:1019–28.

Komar, N. 2003. West Nile Virus: Epidemiology and Ecology in North America. *Advances in Virus Research* 61:185–234.

Keswa, S., Robin, L.A. (2010) Migrant Health. Infectious diseases in non-UK born populations in England, Wales and Northern Ireland. At www.hpa.org.uk/publications/2006/migrant_health/default.htm.

Lederberg, J. 2000. Infectious History. *Health Science* 288:287–93.

Leenaars, M., Hooijmans, C. R., van Veggel, N., ter Riet, G., Leeflang, M., Hooft, L., …Ritskings-Hoitinga, M. (2012). A step-by-step guide to systematically identify all relevant animal studies. *Laboratory Animals, 46*(1), 24–31.

Mongan-Rallis, H. (2006). *Guidelines for writing a literature review.* Education Department. University of Minnesota Duluth. Nova Southeastern University Alvin Sherman Library. (2010). APA Style (6th ed.) – Library Guide [Webpage]. Retrieved from http://nova.campusguides.com/apa

Maswell , L. and Thomas, T.K. (2011). *The Coming Plague*. NewYork: Farrar, Straus and Giroux

Mauss, K., Jackob, L.I. and (2012). Researching your topic [Webpage]. Retrieved from Dartmouth University website at http://www.dartmouth.edu/~writing/materials/student/ac_paper/research.shtml

Musa, M.J., N. Hall, E. Fung, et al. (2011). Genome Sequence of the Human Malaria Parasite *Plasmodium falciparum*. *Nature* 419:498–511

Mukwa, R., J. La Montagne, and A.S. Fauci. (2010). Biomedical Research—An Integral Component of National Security. *New England Journal of Medicine*. 350:2119–21

Mauss, S., Aroben, I. (2010) Avian influenza and infectious disease, accessed via The Royal Society website at www.royalsoc.ac.uk/document.asp?tip=0&id=4823.

Murary, D.B., P.L. Raghunathan, B.P. Bell, *et al.* (2005 & 2010). Investigation of Bioterrorism-Related Anthrax, United States, 2001: Epidemiologic Findings. *Emerging Infectious Diseases* 8:1019–28.

Murary, N., Robin, K. (2012). West Nile Virus: Epidemiology and Ecology in North America. *Advances in Virus Research* 61:185–234

Naser, G. D. and Iaqube, T.L. (2009). *Guide to writing empirical papers, theses, and dissertations.* New York: Marcel Dekker.

Ontario Public Health Library Association (OPHLA). (2008). Critical appraisal of research evidence 101 [Webpage]. Retrieved from http://www.health.gov.on.ca/english/providers/program/pubhealth/oph_standards/ophs/progstds/pdfs/caore.pdf

Ponticiello, A., Sturkenboom, M.C., Simonetti, A., Ortolani, R., Malerba, M. and Sanduzzi, A. (2010). Deprivation, immigration and tuberculosis incidence in Naples, 1996–2000, *European Journal of Epidemiology* **20**, 729–734)

PLoS Medicine. 2005. The Global HIV/AIDS Vaccine Enterprise: Scientific Strategic Plan. http://medicine.plosjournals.org/archive/15491676/2/2/pdf/10.1371_journal.pmed.0020025-S.pdf. Accessed on September 8, 2005

Purugganan, M., & Hewitt, J. (2011) *How to read a scientific article.* Unpublished manuscript. Houston, TX: The Cain Project in Engineering and Professional Communication, Rice University. Retrieved from: http://www.owlnet.rice.edu/~cainproj/courses/sci_article.pdf

Purdue Online Writing Lab. (2012). Annotated bibliographies [Webpage]. Retrieved from Purdue University website at http://owl.english.purdue.edu/owl/resource/614/01/

Primary health care. (n.d.). In *MeSH database*. (2011) Retrieved from http://www.ncbi.nlm.nih.gov/mesh?term=primary%20health%20care

Peter, A.T.and Fix, H. (2007) Doing a literature review in health and social care: A practical guide (2nd ed.). Maidenhead: McGraw-Critical Appraisal Skills Programme (CASP) at the Public Health Hill/Open University Press. CASP International Network (n.d.). Research Unit. Appraisal Webpage]. Retrieved fromTools

Puoti, J., Lieisan, M. (2012). ENGI 600: Template for taking research notes. Retrieved from Rice Center for Engineering website at http://rcel.rice.edu/engi600/ *Thesis Literature Review Handbook v.1* **53**

Peters, G., Kasper, D.L., E. Braunwald, A.S. Fauci, S.L. Hauser, D.L. Longo, and J.L. Jameson, Eds. (2011). *Harrison's Principles of Internal Medicine: Microbial Bioterrorism*, p. 1284. New York: McGraw Hill

Puoti, I., Leclerc, C. M., & Kensinger, E. A. (2012). Effects of Infectious Diseases: A Study on South American Population.

Peters, D.M., G.K. Folkers, and A.S.Fauci. (2012). The Challenge of Emerging and Re-emerging Infectious Diseases. *Nature* 430:242–49

Parker, M. and Takil, H. (2007). Project Bioshield: Protecting Americans from Terrorism. *FDA Consumer* 38:32–33

Peters, C.J. (2005). Marburg and Ebola: Arming Ourselves against the Deadly Filoviruses. *New England Journal of Medicine* 352:2571–73

Robart, A.S. and Jhon, D.K. (2011). Infectious Diseases: Considerations for the 21st Century. *Clinical Infectious Diseases* 32:675–85

Robart, C.M., J.A. Eisen, K.E. Nelson, I.T. Paulsen, and S.L. Salzberg. (2010). The Value of Complete Microbial Genome Sequencing (You Get What You Pay For). *Journal of Bacteriology* 184:6403–05

Science research imagination. London: Sage Publications. (2012) *Thesis Literature Review Handbook v.1* **55**

Sikandar, R., G.M. Subramanian, A. Halpern, et al. (2011). The Genome Sequence of the Malaria Mosquito *Anopheles gambiae*. *Science* 298:129–49

Taylor L.H., S.M. Latham, and M.E. Woolhouse. 2001. RiskFactors for Human Disease Emergence. *Philosophical Transactions of the Royal Society B: Biological Sciences* 356:983–89.

Taylor, D. (2010). The literature review: a few tips on conducting it [Webpage]. Retrieved from the University of Toronto, Health Sciences Writing Centre, website at http://www.writing.utoronto.ca/advice/specific-types-of-writing/literature-review

Techalew, J. M. (Ed.). (2011). *Oxford dictionary of public health* [Online detection of emotional information. *Psychology and Aging, 23*(1), 209–15.

UNAIDS. 2004. UNAIDS at Country Level: Progress Report

University of Namibia. (2011). *Student Guide: Postgraduate Studies*. Retrieved from http://www.unam.na/prospective/postgraduate_guide2011.pdf

University of Washington Health Sciences Library. (2012). PubMed at the UW [Webpage]. Retrieved from http://libguides.hsl.washington.edu/pubmed

Ungchusak, K., P. Auewarakul, S.F. Dowell, et al. 2005. Probable Person-to-Person Transmission of Avian Influenza A (H5N1). *New England Journal of Medicine* 352:333–40

Weiss, R.A. and McMichael, A.J. (2010) Social and environmental risk factors in the emergence of infectious diseases. *Nature Medicine* **10**, S70–S76.

Wittenberg University Library. (2010). Scholarly vs. popular articles [Webpage]. Retrieved from http://www6.wittenberg.edu/lib/help/schol-pop.php

World Health Organization. 2010. The World Health Report 2004— Changing History. http://www.who.int/whr/2004/en/. Accessed on September 8, 2011.

World Health Organization. 2010. Progress on Global Access to HIV Antiretroviral Therapy: An Update on 3 by 5. http://www.who.int/3by5/fullreportJune2005.pdf. Accessed on September 8, 2010.

World Health Organization. Roll Back Malaria.(2012) http://www.rbm.who.int/cmc_upload/0/000/015/367/RBMInfosheet_6.htm. Accessed on September 8, 2010

World Health Organization. Smallpox Fact Sheet. http://www.who.int/mediacentre/factsheets/ smallpox/en/. Accessed on September 8, 2010

World Health Organization. Poliomyelitis Fact Sheet. http://www.who.int/mediacentre/ factsheets/fs114/en/. Accessed on September 8, 2009

World Health Organization. 2010. Avian Influenza: Assessing the Pandemic Threat. http://www.who.int/csr/disease/influenza/WHO_CDS_2005_29/en/ Accessed on September 8, 2009

World Health Organization. SARS: Breaking the Chain of Transmission. http://www.who.int/ features/2003/07/en/. Accessed on September 8, 2009

World Health Organization. Avian Influenza. http://www.who.int/csr/disease/ avian_influenza/en/. Accessed on September 8, 2009

World Health Organization. (2008, February 25). Systematic reviews of evidence [PowerPoint presentation]. Retrieved from http://www.gfmer.ch/400_Publications_En.htm

World News. (2012). Literature review [Video]. Retrieved from http://wn.com/literature_review

Yang H, S.K. Kim, M. Kim, et al. 2010. Antiviral Chemotherapy Facilitates Control of Poxvirus Infections through Inhibition of Cellular Signal Transduction. *The Journal of Clinical Investigation* 115:379–87

Rajshahi University Library
Documentation Section
Document No... D-3814
Date... 14/6/15