Information and Knowledge Management
ISSN 2224-5758 (Paper) ISSN 2224-896X (Online)
Vol.3, No.3, 2013

The Interaction Effects of the Factors Influencing Knowledge and Consciousness of the Infectious Diseases: Bangladeshi Population

Behzad Noor[1], J. A. M. S. Rahman[2], Mir Abdullah Shahneaz[3*], Rashadur Rahman[4], Shafiqul Alam[5]

1. Assistant Professor, Department of Business Administration, Shanto-Mariam University of Creative Technology, Uttara, Dhaka, Bangladesh
2. Professor, Department of Population Science and Human Resources Development, University of Rajshahi, Bangladesh
3. Lecturer, Department of Business Administration, Shanto-Mariam University of Creative Technology, Uttara, Dhaka, Bangladesh
4. Lecturer, Department of Business Administration, Shanto-Mariam University of Creative Technology, Uttara, Dhaka, Bangladesh
5. Lecturer, Department of Business Administration, Shanto-Mariam University of Creative Technology, Uttara, Dhaka, Bangladesh

* E-mail of the corresponding author: major.navana@yahoo.com. Cell: +8801717428206

Abstract

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 infectious diseases of the studied population (Here two most important infectious diseases are considered as HIV/AIDS and Hepatitis B) level of the people. It can be mentioned that with 10% increase in the respondent's educational attainment, the consciousness level could also be increased by 1.26%. However, 10% increase in the habit of watching TV can increase the consciousness about HIV/AIDS by 1.26% which is same as the probability of the increment of educational attainment. In the case of the consciousness about Hepatitis B1 (HB1) virus it can be seen that the 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% increase in the respondent's habit of taking protected water, the habit of taking HB1 vaccine could also be increased by 1.36%. However, with 10% 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%.

Keywords: Hepatitis B1, HIV/AIDS, Linear Probability Model (LPM).

Introduction

An infectious disease is a clinically evident disease resulting from the presence of pathogenic microbial agents, including pathogenic viruses, pathogenic bacteria, fungi, protozoa, multicellular 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 [1]. 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 [2]. 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 [3]. Among the almost infinite verities of organisms, relatively few cause diseases in other healthy individuals [4]. 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. Infectious microorganisms, or microbes, are therefore classified as either primary pathogens or as *opportunistic pathogens* according to the status of host defense. Primary pathogens cause disease as a result of their presence or activity within the normal, healthy host, and their intrinsic virulence (the severity of the diseases they cause) is, in part, a necessary consequence of their need to reproduce and spread. Many of the most common primary pathogens of humans only infect humans, however many serious diseases caused by organisms acquired from the environment or which infect no-human hosts. Organisms which cause an infectious disease in a host with depressed resistance are classified as *opportunistic pathogens*. An opportunistic diseases requires impairment of the host defenses, which may occur as a result of genetic defects (such as Chronic granulomatous disease), exposure to the anti-microbial drugs or immunosuppressive chemicals (as might occur following poisoning or cancer chemotheraphy), exposure to ionizing radiation, or as a result of an infectious disease with immunosuppressive activity (such as measles or HIV diseases).

The most familiar classification of infectious disease for most of us is characterized by the causative organism. Pathogenic organism, bacteria, viruses, fungi, and parasites have properties that can cause disease. We will limit our discussion to bacteria and viruses because they are the infectious agents that are most likely to be used by terrorists. One of the major morphologic characterizations of bacteria is determined by whether the bacteria gram stains. For example, anthrax and botulism are both caused by gram-positive bacilli while plague is caused by gram-negative bacteria.

Microbiological Classification of Infectious Diseases	
Bacterial	**Gram-Negative** **Gram-Positive**
Viral	**DNA Virus** **RNA Virus** **Enveloped vs Non-Enveloped**
Fungal	**Disseminated** **Localized**
Parasitic	**Protozoa** **Helminths**

Bacteria are also morphologically classified by their shape and arrangement. In addition to the morphological classification, bacteria can be classified biochemically. Viruses are the smallest of the infectious agents. They range in size from 20 to 200 nana meters, which is a size that cannot be easily seen by light microscopy. Viruses contain either DNA or RNA and are either enveloped or non- enveloped, which are important factors for classifying the virus. The entire infectious virus is called a virion. For example, smallpox is a DNA virus and is a member of the genus orthopoxvirus. The orthopoxviruses are among the largest and most complex of all viruses with the virion having a diameter of about 200 nm. Monkeypox, vaccinia, and cowpox are also members of this genus. These viruses can also infect humans.

Sources of Data

The data of this study was taken from the 2007 Bangladesh Demographic and Health Survey (BDHS 2007). The BDHS 2007 is a nationally representative survey from 10,996 women age 15-49 and 3,771 men aged 15-54 from 10,400 household covering 361 sample points (cluster) throughout Bangladesh 134 urban areas and 227 in the rural areas. The daya has collected from these six administrative divisions for the country- Barisal, Chittagong, Dhaka, Khulna, Rajshahi and Sylhet. The present study utilizes the BDHS data, 2007 ever-married women of age 10-49 are considered by the study. Our study sample is 3151.

Result and Discussion

Data were come from Bangladesh Demographic and health Survey (BDHS 2007). Here 7680 data were considered in this study. Some basic characteristics of this population are

Following tables show the result of association of different attributes with their corresponding cross tabulation, calculated chi-square and tabulated chi-square value with their corresponding d.f., ρ value, the significance level of association at 5% and finally the mean and standard deviation value of each group to enclose the average number of respondents in each of the group with their variation for the different independent variables.

Table-1: Distribution of final say on using condom as a security measure for Preventing Contamination of HIV/ AIDS with Educational Attainment

Educational Attainment	Reducing Chance of HIV/AIDS by Using Condom			Calculated λ^2 and ρ Values	Significance level of association at 5%	Mean	Standard deviation
	No	Yes	Total	$\lambda^2_{cal} = 161.8$		0.3489	0.47677
Illiterate	1019 (26.2%)	546 (14.5%)	1516 (20.5%)	d.f.= 1		0.5275	0.49928
Literate	2874 (73.8%)	3209 (85.5%)	6083 (79.5%)	$\rho = 0.00$	**Significant**	0.4910	0.49995
Total	3893 (100%)	3755 (100%)	7648 (100%)				

From the above Table 1 it can be noticed that mammoth number (26.2%) of illiterate respondents responded as they didn't use condom as the protection measure at the time of intercourse and on the other hand majority (85..5%) literate respondents use condom at the time of sexual intercourse. It reflects the fact that with the education a person comes to know many information regarding the security of the prevalence of HIV/AIDS without which it is almost impossible to keep the protection level intact.

Table-2: Distribution of final say on using condom as a security measure for Preventing Contamination of HIV/ AIDS with the Habit of Watching TV

Variable	Reducing Chance of HIV/AIDS by Using Condom			Calculated λ^2 and ρ Values	Significance level of association at5%	Mean	Standard deviation
Watching TV	No	Yes	Total	$\lambda^2_{cal} = 151.2$		0.3818	0.48594
No	887 (23.6%)	2868 (76.4%)	3755 (100%)	d.f.= 1	Significant	0.5386	0.49856
Yes	3344 (43.7%)	4304 (56.2%)	7648 (100%)	$\rho = 0.00$		0.4910	0.49995
Total	4231 (100%)	7167 (100%)	11398				

Here from Table 2 it can be realized that with the habit of watching TV the habit of using condom at the time sexual intercourse increased. It reflects that electronic media as TV has it's own part to provide various information about various life threatening infectious diseases as HIV/AIDS by telecasting varieties of informative program and medical talk show.

Table-3: Distribution of final say on using condom as a security measure for Preventing Contamination of HIV/AIDS with the economic status of the respondents

Variable	Reducing Chance of HIV/AIDS by Using Condom			Calculated λ^2 and ρ Values	Significance level of association at 5%	Mean	Standard deviation
Economic Status	No	Yes	Total			0.3925	0.48845
High Economic Status						0.5211	0.49960
Low Economic Status	3052 (81.3%)	703 (18.7%)	3755 (100%)	$\lambda^2_{cal} = 151.2$ d.f.= 1 $\rho = 0.00$	Significant	0.4910	0.49995

Here from Table 3 it can be viable that the majority of the respondents with high economic status (72.1%) are 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 81.3% are not used to use condom at the time pf sexual intercourse. This reflects that with the enhancement in economic status a person become more and more conscious as they consider so many protections to keep themselves away from the pandemic.

Table-4: Distribution of final say on using condom as a security measure for Preventing Contamination of HIV/ AIDS with the place of residence of the respondents

Variable	Reducing Chance of HIV/AIDS by Using Condom			Calculated λ^2 and ρ Values	Significance level of association at 5%	Mean	Standard deviation
Place of Residence	No	Yes	Total			0.5444	0.49810
Urban						0.4453	0.49706
Rural	1920 (51.1%)	1835 (48.9%)	3755 (100%)	$\lambda^2_{cal} = 151.2$ d.f.= 1 $\rho = 0.00$	Significant	0.4910	0.49995

Now, from Table 4 it is notified that urban people are more frequent in using condom (58.7%) at the time of intercourse than those of the rural people (48.9%). This happens because many rural people are not been able to collect the up to date information regarding the protection process of the infectious diseases like HIV/AIDS and that's why they don't have the know-how about those consciousness oriented knowledge.

To predict the final say on use of condom as security measure for the respondents a linear probability model has been fit. A set of independent and dependent variables are defined as:

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

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

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

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

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

The fitted linear probability model is disclosed to predict "Final say on the consciousness on infectious disease" for eligible respondents. The model is represented bellow:

$$R_i = 0.126E_i + 0.126WT_i \}$$

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 herewith bellow:

$$WT_i = 0.247WI_i + 0.203PR_i + 0.092E_i \ \}$$

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

$$E_i = 0.191WI_i + 0.027PR_i$$

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 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 be able to rich his or her bank of knowledge.

From equation 3, 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 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% increase in the respondent's educational attainment, the consciousness level could also be increased by 1.26%. However, 10% increase in the habit of watching TV can increase the consciousness about HIV/AIDS by 1.26% which is

same as the probability of the increment of educational attainment.

It has been found that 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% and 10% 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).

Furthermore, the respondent's income and the place of residence highly and significantly influence educational attainment of the respondents. That is, the respondents who have the high level of income and to those who have a higher status of living has the higher probability to have the higher level of educational attainment. From equation 5 it is clear that for 10% increase in respondent's income and 10% improvement in the place of residence allow to acquire a better educational background is essential for gathering the informative news about the infectious diseases like HIV/AIDS.

So, thorough the three equations of linear probability model it has been clear that education, income, and living areas are the most important and significant factors those affect consciousness level of a respondents positively. So, it is obligatory to improve the educational attainment which bring the opportunity to live in the upgraded zone.

No, from equation 4 and 5 it can be revealed as:

$$WT_i = 0.247WI_i + 0.203PR_i + 0.092E_i$$
$$\triangleright\ WT_i = 0.247WI_i + 0.203PR_i + 0.092(0.191WI_i + 0.27PR_i)$$
$$\triangleright\ WT_i = 0.247WI_i + 0.203PR_i + 0.0174WI_i + 0.0248PR_i$$
$$\triangleright\ WT_i = 0.467WI_i + 0.227PR_i \quad \text{.....(6)}$$

From equation 6 it is clear that the habit of watching TV highly depended on income and the place of residence. That is, a person who will have a better income with a better place of residence will be facilitated by the habit of having the latest news and views about any infectious diseases or any latest part through the process of being connected with electronic media.

Again, from the equation 3, 5 and 6 we can solve the following equation:

$$R_i = 0.126E_i + 0.126WT_i$$
$$\triangleright\ R_i = 0.126(0.19WI_i + 0.027PR_i) + 0.126(0.467WI_i + 0.227PR_i)$$
$$\triangleright\ R_i = (0.023WI_i + 0.0034PR_i + 0.0588WI_i + 0.0287PR_i)$$
$$\triangleright\ R_i = (0.0818WI_i + 0.0321PR_i) \quad \text{.....(7)}$$

From (7) 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. 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.

Significance and Dissemination of the Result

The social norms and policy environment influence the risky and safe behaviour of people. In turn, policy interventions also can effectively change societal norms and behaviours to promote preventions programs of various infectious diseases at the aggregate level. Childhood and adult mortality can be reduced dramatically through improved management of infectious diseases and prevention via introduction of vaccines and behaviour modification. New technology are providing opportunities for rapid, practical diagnostic tests which will improve management; vaccines which can provide prevention opportunities; options for treatment include an enhanced "super ORS"; and novel antimicrobial therapies. Understanding the control of infectious diseases requires and understanding of basic mechanisms and from the perspective our desire is to undertake studies of how certain bacteria affect human being, how they spread to people, what type of carelessness (i.e., causes of the prevalence of infectious diseases) the general people possess that allow those diseases to be gripped, and how people could protect themselves from those diseases.

Based on continuing challenges, opportunities, and relative strengths, our study has identified initially the following actions for infectious diseases to eradicate it's catastrophic effect:

1. To define the epidemiology and burden of selected infectious diseases and identify effective strategies for prevention and control. These include tuberculosis, diarrhea, ALRI (pneumonia), typhoid fever, dengue malaria, kala azar, and drug resistance infections.
2. To develop and/ or evaluate rapid or simple diagnostic tests to improve case detection and surveillance.
3. To define the need for selected vaccines, e.g., hepatitis B, and evaluate promising new vaccines for enteric (rotavirus, cholera, ETEC, typhoid) and respiratory infections (*H influenzas, pneumonia, viral influenza, RSV),* dengue, and tuberculosis. Conduct trials of relevant new vaccines including phase 1, 2 and 3 trials.
4. To enhance the capacity to investigate, study, and manage outbreaks of communicable diseases in the regions.
5. To assists with technology transfer to allow other countries to manage the merging infectious diseases, especially related to cholera and rotavirus (world wide), and HIV/AIDS in the region.
6. To exploit the huge database that have been generated on genomes of bacterial, viral and parasitic pathogens to understand and dissect differences in pathogenic microorganisms isolated in this part of the world.

Apart of that we do believe that many more implacable and indispensable findings with corresponding policy implications will be delivered through this study which will hopefully help the Government and non-government institutions to rebuild their plan of action for the purpose of dragging people out from the vulnerability of infecting with various life threatening infectious diseases.

References

1. Dorland's Illustrated Medical Dictionary 2004 WB Saunders
2. "Infectious disease." *McGraw-Hill Encyclopedia of Science and Technology*. The McGraw-Hill Companies, Inc., 2005.

3. Glossary of Notifiable Conditions Washington State Department of Health
4. This section incorporates public domain materials included in the text: Medical Microbiology Fourth Edition: Chapter 8 (1996). Baron, Samuel MD. The University of Texas Medical Branch at Galveston
5. Kenneth J. Ryan and C. George Ray, Sherris Medical Microbiology Fourth Edition McGraw Hill 2004.
6. Infectious and Epidemic Disease in History
7. Dobson, Andrew P. and E. Robin Carter (1996) Infectious Diseases and Human Population History (full-text pdf) Bioscience; 46 2.
8. Smallpox and Vaccinia. *National Center for Biotechnology Information.*
9. Smallpox: The Triumph over the Most Terrible of the Ministers of Death
10. Multidrug-Resistant Tuberculosis. *Centers for Disease Control and Prevention.*
11. David W. Tschanz, MSPH, PhD (August 2003). "Arab Roots of European Medicine", *Heart Views* 4 (2).
12. Watts, D. J. (2006) Six Degrees: the Science of a Connected Age. London: William Heinemann
13. Smallpox and Vaccinia. *National Center for Biotechnology Information.*
14. Watts, D. J. (2006) Six Degrees: the Science of a Connected Age. London: William Heinemann

Biography of the Authors:

Md. Behzad Noor has completed Masters from the Department of Human Resource Development (HRD), University of Rajshahi, Bangladesh and stood **First Class First**. He has completed M. Phil. under the aforesaid Department, University of Rajshahi, Bangladesh. Presently he is working as an Assistant Professor, Department of Business Administration, Shanto-Mariam University of Creative Technology, Dhaka, Bangladesh.

Mir Abdullah Shahneaz was born in 'Shefa Kunjoo' 42, Kazi Nazrul Islam Road, Court Para, Kushtia-7000, Bangladesh on 1st January, 1986. He is pursing PhD (with full scholarship) from Jahangirnagar University, Dhaka, Bangladesh. He received Masters in Development Studies, 2010 from Islamic University, Kushtia, Bangladesh, Masters in Economics,2007(11th Stand) and Bachelor (Hon's) in Economics, 2006 ,from National University, Gazipur, Bangladesh. At present he is working as a lecturer in Economics in the Department of Business Administration in Shanto Mariam University of Creative Technology, Uttara, Dhaka, Bangladesh.

Rashadur Rahman was born in House No # 34, Road No # 08,Sector No #11, Uttara Model Town,Dhaka-1230., Bangladesh on January 15, 1978.He received Masters of Business Administration (MBA),Major in Marketing,2004 and Bachelor of Business Administration (B.B.A), Major in Marketing,2001 from Dhaka University, Dhaka, Bangladesh. At present he is working as a Sr. lecturer of department of business administration in Shanto Mariam university of Creative technology, uttara, Dhaka, Bangladesh.

Shafiqul Alam has been graduated in Management from Bangalore University India, and completed master's in Human Resource Management from Anglia Ruskin University Cambridge, UK. Currently he has been working as a lecturer of business faculty at Shanto Marium University of Creative Technology Dhaka, Bangladesh. Previously he was a faculty at CLA UK, London Capital College UK, Graduate Trainee program at Tesco PLC UK and a research associate at Cambrian proposed University in Dhaka, Bangladesh.

This academic article was published by The International Institute for Science, Technology and Education (IISTE). The IISTE is a pioneer in the Open Access Publishing service based in the U.S. and Europe. The aim of the institute is Accelerating Global Knowledge Sharing.

More information about the publisher can be found in the IISTE's homepage: http://www.iiste.org

CALL FOR PAPERS

The IISTE is currently hosting more than 30 peer-reviewed academic journals and collaborating with academic institutions around the world. There's no deadline for submission. **Prospective authors of IISTE journals can find the submission instruction on the following page:** http://www.iiste.org/Journals/

The IISTE editorial team promises to the review and publish all the qualified submissions in a **fast** manner. All the journals articles are available online to the readers all over the world without financial, legal, or technical barriers other than those inseparable from gaining access to the internet itself. Printed version of the journals is also available upon request of readers and authors.

IISTE Knowledge Sharing Partners

EBSCO, Index Copernicus, Ulrich's Periodicals Directory, JournalTOCS, PKP Open Archives Harvester, Bielefeld Academic Search Engine, Elektronische Zeitschriftenbibliothek EZB, Open J-Gate, OCLC WorldCat, Universe Digtial Library , NewJour, Google Scholar