

# A Comparative Study of the Socio-Demographic Variables with Respect to the Knowledge of Bird Flu between a Rural and an Urban Slum Community of West Bengal, India

Shibani Datta<sup>1\*</sup>, Shibotosh Sen<sup>2</sup>, Bhaswati Sengupta<sup>3</sup>, Sita Chatterjee<sup>4</sup> and Gautam Dhar<sup>5</sup>

<sup>1</sup>Department of Public Health Administration, All India Institute of Hygiene & Public Health, Kolkata

<sup>2</sup>MPH (PGT) All India Institute of Hygiene & Public Health, Kolkata

<sup>3</sup>Professor & Head of Public Health Administration Department, All India Institute of Hygiene & Public Health, Kolkata

<sup>4</sup>Associate Professor, Dept of Community Medicine, SSKM Hospital, Kolkata

<sup>5</sup>Assistant Professor, NRS Medical College, Kolkata

## Abstract

Every year in the early spring Bird Flu poses a threat to the community. H5N1 virus is also getting robust day by day acquiring an ability to cross the species barrier. It is now known as (H5N1) which is emerging as killer virus to man. Though human casualty is yet to be recorded from India but the threat is not over.

**Objectives of the study:** 1) To assess and compare the differences of knowledge and practice regarding Bird flu and poultry maintenance in between the rural and urban population. 2) To study the different socio-demographic factors responsible for this.

**Material and methods:** The present study had been undertaken in the village of Hakimpur of Singur Block of District Hooghly, West Bengal with a population 862 of 215 families and in an urban slum of Chetla lockgate area of service area of Urban Health Centre Kolkata with a population of 1014 of 250 families. One responsible adult member from each family was interviewed. Information regarding socio-demographic profile, poultry keeping, correct knowledge about bird flu, mode of transmission, culling etc. was recorded.

**Result:** The Results showed that 45.6% rural and 55.1% urban slum respondents know what Bird Flu is, 75.3% rural and 58.8% urban slum respondents know the mode of transmission, 32.6% rural and 31.2% urban slum respondents know the procedure of culling. The knowledge of transmission by Infected Body Fluids among Literate Respondents were significantly high than the Illiterate Respondents. The predominant source of information was Mass Media. 57.14% of the rural families rearing poultry, kept the birds in shed, 40.48% in cage and 2.38% in living room. 91.67% of the urban slum families rearing poultry kept birds in the cage and the rest of them kept birds in living room. 39.2% urban slum respondents believe that isolation of diseased birds is helpful to arrest an outbreak and 44.7% rural respondents believe that the transmission of Bird Flu can be reduced by Culling at the time of an outbreak. 78% urban slum respondents believe that poultry products can be used at the time of an outbreak.

**Keywords:** (H5N1); Knowledge; Literacy Status; Bird Flu; Culling; Mass Media

## Introduction

Influenza A virus subtype H5N1 can cause illness in humans and many other animal species [1]. The first case of bird flu in India has been reported from the Nandurbar Slaughter House in the western state of Maharashtra on February 18, 2006. No human case has been found in India till date.

H5N1 preferentially binds to a type of galactose receptors that populate the avian respiratory tract from the nose to the lungs and are virtually absent in humans, occurring only in and around the alveoli. Thus the virus is not easily expelled by coughing and sneezing in human [2,3]. On September 27, 2007 researchers reported that the H5N1 can also pass through the placenta to infect the fetus [4]. Migrating waterfowl (wild ducks, geese and swans) carry H5N1, often without becoming sick [5,6].

The spread of HPAI (Highly Pathogenic Avian Influenza) in poultry throughout Asia is almost entirely due to human activity. The virus has been able to travel large distances through the buying and selling of infected birds; by hitching a ride on transport equipment (e.g. vehicles, cages, egg crates) or workers' clothing and shoes; and through contact with contaminated manure, soil and litter. H5N1 can survive in cool temperatures in manure for at least three months, and a single gram of manure can contain enough viral material to infect one million birds. In water, the virus survives for four days at

72°F / 22°C and 30 days at 32°F / 0°C. It can survive indefinitely in frozen poultry meat. Eggs can also harbor the virus. Proper cooking (to 162°F / 72°C) of poultry meat and eggs will deactivate the virus. Good hygienic practices such as separating raw meat from cooked or ready-to-eat foods (i.e., using different knives and cutting boards) and washing hands after handling frozen or raw meat and eggs will ensure the virus not to spread the disease through food. To date no human has been infected from properly handled food [7]. In general, eggs are perceived to be safer than meat, and consumer demand seems to have been largely unaffected by HPAI [8].

Bird Flu was confirmed in West Bengal, India on 16th January 2008. The main affected districts were Murshidabad, Birbhum (Rampurhat and Nalhati), South Dinajpur (Balurghat), Nadia, Burdwan, Bankura,

**\*Corresponding author:** Dr. Shibani Datta, Associate Professor, Department of Public Health Administration, All India Institute of Hygiene & Public Health, Kolkata, E-mail: [shibani.datta@yahoo.com](mailto:shibani.datta@yahoo.com)

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Koochbihar, Darjeeling and Hooghly. No human case has occurred in West Bengal till date. In Hooghly the Avian Influenza outbreak occurred in Block Chanditala-II and Hutpur village in the year 2008 [9].

Our rural study area was Hakimpur which is adjacent to the above mentioned villages. We selected a comparable urban slum in Kolkata in the Urban Health Centre service area for operational feasibility. In both the area there is no history of occurrence of avian influenza, but there is every possibility of its occurrence in near future. Moreover the poultry keepers who are most likely to become infected with bird flu. Thus proper knowledge of bird flu and poultry rearing practice is very necessary for them. Keeping this in our mind we selected this particular village and urban slum to see whether the inhabitants have adequate knowledge to combat avian flu outbreak in near future.

## Material and Methods

This community based cross-sectional study was undertaken in December 2009 in the village named Hakimpur, Block Singur, District Hooghly, State West Bengal of India and in the urban slum of Chetla in the city of Kolkata of India in the month of April and May 2010. Investigators along with other health staffs collected the data by census method by house to house survey from the head of the families of all the 465 families of the study area and recorded in a predesigned and pretested schedule. The Information regarding socio-demographic profile, poultry keeping practices, correct knowledge about Bird Flu, mode of transmission and culling etc were recorded.

## Results and Discussion

Our rural study area was Hakimpur village of Singur Block of District Hooghly, which is adjacent to the above mentioned villages with a population 862 of 215 families and in an urban slum of Chetla lockgate area of service area of Urban Health Centre Kolkata with a population of 1014 of 250 families.

This community based cross-sectional study was undertaken in December 2009 in the village and June to August 2010 in the urban slum of West Bengal. Information regarding socio-demographic profile, poultry keeping practices, correct knowledge about Bird Flu, mode of transmission and culling etc were recorded. It was asked "What is Bird Flu?" The expected correct answer was "Bird Flu is a type of Flu or Influenza like common cold." The next questions were about correct knowledge about the mode of transmission (bird to man, bird to bird, bird to bird & man, man to bird) - any one of the italicized responses was marked correct. Symptoms in Bird, symptoms in Man, the Effect of Bird Flu (whether it kills bird, kills man, kills both bird & man, usually man get cured, incurable to man) - any one of the italicized responses was marked correct, Knowledge about Culling procedure (birds burnt, neck broken without bleeding, cut through neck, affected birds segregated) - the italicized response was marked correct. Findings are shown in the Table 2. The data was later analyzed by applying chi-square test for significance.

The predominant occupation of the rural household (n=215) was farming (36.27%) whereas that of urban slum (n=250) was unskilled labour (32.8%). 54.52% of the population were males in the village with the sex ratio of 834 females/1000 males but 51.68% of the population were males in the urban slum with a sex ratio of 935 females/1000 males. According to Prasad's Scale (updated as per Index for March 2nd 2003) 28.85% rural families were in the group of Rs. 330-659 per capita per month and they belong to the Social Class IV [10] and 13.95% of the families were earning < Rs.330 per capita per month

i.e. Social Class V. According to Kuppuswamy's Social Classification (scores of 2003 modified for 2007) 79.6% urban slum families were in the Social class IV with socioeconomic score 5-10. All the households were of Hindus. 88.83% rural families and 64% urban slum families were of General Caste. More Scheduled Caste families (35.6%) were staying in the urban slum than the village (11.2%). 43.4% villagers and 31.5% urban slum people studied or were studying in Middle School.

In a study done in 2006 at Laos by Barennes et al. [11] the illiteracy rate: 7.2% versus 10% in urban and rural areas, respectively, in our study 25.1% versus 12.5% in urban slum versus rural areas and nearly 60% kept poultry at home [11]. In our study among males, 9.4% were illiterates in village and 19.3% in urban slum. Among females, 16.4% were illiterates in village and 31.4% in urban slum. The literacy status of the rural population was more than the urban slum as a whole and also between both the sexes. In both the study areas it is found that the percentage of illiteracy is high among the female population (Table 1). More rural families (19.5%) kept Poultry at their house than the urban counterpart (4.8%). Among the poultry rearing rural families 57.14% kept the birds in the shed, 40.48% in cage and 2.38% (1 out of 42) in living room. There was no separately built shed found in the urban slum families. Those who rear poultry, 91.67% of them kept birds in the cage and the rest of them (8.33% - 1 out of 12) kept birds in living room. Excreta of the birds were disposed only by cleaning with water. Intimacy of the children with the birds was assessed. Only 20% the families having children among the poultry rearing rural families said that children of their family played intimately with the poultry birds. There was no such response in the poultry rearing urban slum families. There was no Veterinary Clinic anywhere in the study areas.

More urban respondents (39.2%) believe that isolation of diseased birds is helpful to arrest an outbreak and more rural respondents (44.7%) believe that the transmission of Bird Flu can be reduced by Culling at the time of an outbreak. However 14.7% urban slum respondents are likely to consume poultry products if there is an outbreak in near future, which is significantly more than rural respondents (5.1%). Although more urban slum respondents (65.2%) are likely to destroy poultry products at the time of an outbreak than the rural counterpart (61.4%) the difference is not statistically significant.

The study shows that 46% of the rural and 56% of urban slum respondents had the correct knowledge of Bird Flu. Olugbenga Bello AJ et al. [12] in a study done at Nigeria showed that 49.1% of the study subjects had the knowledge of Avian Flu [12]. Similar type of study conducted by UNICEF in Moldova shows 98% of the respondents knew about the disease which is quite higher than the present study [13]. Though the Respondents had several sources of knowledge, the predominant source appeared to be TV and Radio. This finding corroborates with the findings of the study done in Moldova where the most important source of information was Mass Media (84.8%) [13]. Respondents of our study also got the knowledge from Friends, Neighbors or Relatives. In the study by Barennes et al. [11] rural areas television and radio were the primary communication means which is similar in our study. Other communication means such as medical staff, leaflets or posters were rarely reported in the study and similar picture was found in our study [11].

In our study the correct knowledge of Bird flu was known to 45.6% of rural and 55.1% of the urban respondents in the Nuclear Families, 47.3% of rural and 58.8% of urban respondents in the Joint Families. However, this knowledge was correctly known to 59% of the Unemployed respondents of both the study areas. M Jahangir Alam et al. [14] showed in a study done in Bangladesh showed that more than

Literacy Status	Comment	Rural	Urban Slum	P value
Literates	More in Rural	681/778 (87.5)	681/909 (74.9)	<0.0001
Illiterate Male	More in Urban Slum	41/436 (9.4)	92/476 (19.3)	<0.0001
Illiterate Female	More in Urban Slum	56/342 (16.4)	136/433 (31.4)	<0.0001
Poultry at House	More in Rural	42/215 (19.5)	42/215 (19.5)	<0.0001

Table 1: Literacy Status of the Study Population of the Rural and Urban Slum Area.

Correct Knowledge among the respondents regarding→	Comment	Rural	Urban Slum	P value	
Bird Flu	Study Area	More in Urban Slum	99/215 (46)	140/250 (56)	0.0323
	Nuclear Families	More in Urban Slum	73/160 (45.6)	98/178 (55.1)	0.0834
	Male members	More in Urban Slum	21/63 (33.3)	43/76 (56.6)	0.0062
	Residents of Mixed Housing	More in Urban Slum	27/70 (38.6)	129/223 (57.8)	0.0048
	Poultry rearing Families	More in Urban Slum	15/42 (35.7)	11/12 (91.7)	0.0020*
Mode of transmission	Poultry rearing Families	More in Urban Slum	18/42 (42.9)	10/12 (83.3)	0.0318
	Not Poultry rearing Families	More in Rural	116/173 (67.1)	137/238 (57.6)	0.0509
Symptoms in Bird	Residents of Kutcha Housing	More in Urban Slum	8/36 (22.2)	8/17 (47.1)	0.0660
Symptoms in Man	Study Area	More in Rural	55/215 (25.6)	14/250 (5.6)	<0.0001
	Nuclear Families	More in Rural	36/160 (22.5)	8/178 (4.5)	<0.0001
	Joint Families	More in Rural	19/55 (34.5)	6/72 (8.3)	0.0002
	Male Members	More in Rural	7/63 (11.1)	2/76 (2.6)	0.0937*
	Female Members	More in Rural	48/152 (31.6)	12/174 (6.9)	<0.0001
	Residents of Mixed Housing	More in Rural	10/70 (14.3)	12/223 (5.4)	0.0137
	Not Poultry rearing Families	More in Rural	45/173 (26)	14/238 (5.9)	<0.0001
Effect of Bird Flu	Joint Families	More in Urban Slum	24/55 (43.6)	43/72 (59.7)	0.0720
	Residents of Mixed Housing	More in Urban Slum	29/70 (41.4)	130/223 (58.3)	0.0135
	Poultry rearing Families	More in Urban Slum	14/42 (33.3)	9/12 (75)	0.0249*

Table 2: Correct knowledge of the respondents regarding 5 important questions with respect to the various socio-demographic variables.

half; 54.06% of the people heard the term “bird flu”; majority of them (95.13%) as a disease [14].

The knowledge of transmission by Infected Body Fluids among Literate Respondents were significantly high than the Illiterate Respondents in both the study areas.

The present study shows 75.3% of the rural and 58.8% of the urban slum respondents (found to be statistically significant between both the study groups) knew about the mode of transmission whereas the study done in Japan shows 66.6% of the study subjects knew about the mode of transmission which is comparable with our study findings [15]. M Jahangir Alam et al. [14] showed among 85.39% respondents know that the disease may transmit to human population. Among the people who heard the name of the disease [14]. But when the knowledge of Mode of Transmission was assessed in the poultry rearing families it was seen that this knowledge was more in urban poultry owners (83.3%). But this knowledge is more in the villagers those who had no poultry (67.1). Though not found statistically significant, it was found those more illiterate respondents in the village (48.6%, urban 57.6%), more male urban respondents (67.1%, rural 58.7%), more female rural respondents (63.8%, urban 55.2%) know the correct mode of transmission of Bird Flu (Table 2).

In the study population about 35.3% rural and 36.4% urban slum respondents had the knowledge that the virus affects the birds only, 48.8% rural and 30.4% urban slum respondents said it is both bird and man. Overall more rural respondents (84.2%) had the correct knowledge about the Susceptible Host than the urban (66.8%) counterpart.

32.6% rural and 31.2% urban respondents know the procedure of culling.

About 42% of the villagers and 54% of slum dwellers were anxious about impending outbreak, either due to loss of poultry (rural 22%,

urban 35%), monetary reasons (rural 21%, urban 15%), loss of human lives (rural 58%, urban 50%).

UNICEF of India conducted a KAP Study in Badwani and Indore district of Madhya Pradesh and Thane district of Maharashtra in October 2007. According to the report the local knowledge regarding Avian Flu was vague and the farmers rarely contacted the Animal Health Department in the Veterinary Hospitals on Poultry issues as travel and treatment for Fowl was considered expensive [16].

The knowledge about the symptoms in Man was significantly more in the rural respondents (25.6%) than the urban counterpart (5.6%). This knowledge was also found significantly more in the rural respondents when assessed individually in the nuclear and joint families (Table 2). M Jahangir Alam et al. [14] showed 42% people had no knowledge about the signs and symptoms of the disease and only 20.35% respondents knew poultry carrying people and poultry meat eaters as “susceptible groups” getting infection. They found a strong association of literacy with the knowledge of the disease ( $p < 0.05$ ) [14].

The knowledge about the symptoms in Birds was almost same in the mixed house dwellers (Rural 40%, Urban slum 38.1%). However this knowledge was more in Urban Pucca house dwellers (60%), and Urban Kutcha house dwellers (47.1%) than the Rural Pucca (46.8%) and Kutcha (22.2%) house dwellers respectively though not significant statistically.

Knowledge about the symptoms in man was found to be more in rural people though the urban slum lifestyle also seems to be favorable for spread of the disease. Our study had few limitations regarding fund, manpower and other logistic support. More such studies need to be conducted without such limitations to confirm such association.

Therefore it is necessary to make people of both the study areas aware regarding bird flu through proper public education and awareness series with emphasis on increasing female literacy, self employment

methods, safe bird handling methods, methods and places of isolation of birds and poultry. Availability and utilization of Government health facility must be increased in both areas with emphasis on rural area. However bigger studies involving more representative population and more diversified areas are required to come to a definitive conclusion in a country like India.

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