

## Assessment of Knowledge Level of Women Towards Major Zoonotic Diseases

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### ABSTRACT

*This study was conducted to know the knowledge level of rural and urban women towards major zoonoses. A survey of 300 randomly selected women from urban and rural areas was conducted through structured interview schedule. Occupation wise distribution of respondents was housewives (49.33%), farming operations (17.33%), service (27.67%), business (3.33%) and daily wage labour (2.33%). Level of education recorded was illiterate (1.67%), primary schooling (2.53%), secondary and higher secondary schooling (29.33%), graduate and above (43.67%). Fairly good awareness about different modes of disease acquisition observed. Respondents were familiar with vector borne diseases viz. Dengue (98.67%), chikungunya (95.00%) and malaria (99.33%); however knowledge of Japanese encephalitis, Q fever, leishmaniasis and trypanosomiasis was almost nil. All the respondents were unaware about the fact that food borne zoonoses like brucellosis, listeriosis and campylobacteriosis causes abortion. Role of vectors in disease transmission viz. mosquitoes and flies was known, but information on role of ticks and flea was poor. Other than tuberculosis (95%), rabies (93.33%), bird flu (96.67%) and swine flu (98.67%), none of the respondents were familiar to brucellosis, hydatidosis, toxoplasmosis, taeniasis. All the respondents opined that there is need of awareness and training on zoonotic diseases to keep them sensible about such public health menace.*

**Key words:** Knowledge level; Zoonoses; Women;

Zoonoses are the diseases transmitted from animals to human and of all the known human pathogens 61% are zoonotic in nature. About 75% newly recognized pathogens in last two decades are zoonotic agents (Christou, 2011). The global burden of zoonoses is relatively more on poor resource countries. The risk of zoonoses transmission is more likely while close association with animals including pets and birds. Zoonotic diseases could be recorded in the form of sporadic cases, endemic, epidemic and pandemic outbreaks. There is no gender and age barrier for majority of the zoonotic diseases and therefore virtually we all are at risk of zoonoses. In a population, children and women are more vulnerable groups at the risk of zoonotic diseases. There are direct and indirect modes of transmission of zoonoses and direct contact, food and vectors are predominant one. There is household risk food contamination by pathogens like *Escherichia*

*coli*, *Salmonella* and *S. aureus*. Pet associated canine and feline zoonoses like rabies, toxoplasmosis, hydatidosis is also of major concern. Knowledge of large and small ruminant associated zoonoses viz. brucellosis, tuberculosis, anthrax, taeniasis and vector borne zoonoses such as Japanese encephalitis, Q fever, leishmaniasis etc. would be crucial for public especially women to combat with zoonoses. In agrarian countries like India, women are the major work force engaged in agricultural activities including animal husbandry. Therefore, priority should be given to their health and hygiene. In view of these facts a study was undertaken to assess the knowledge level of women towards major zoonotic diseases.

### METHODOLOGY

A total of 300 women respondents, from rural and urban areas were selected by simple random sampling

method. The data were collected with the help of structured schedule by personal interview method. Before interview, women participant member of the family was briefed about the purpose of this study and after their consent they were included as respondents. Marathi a local language of Maharashtra and Hindi if required were used for the interview. Questions were asked regarding to education, occupation, modes of zoonoses transmission, food borne zoonoses, vector borne zoonoses and other major zoonoses like brucellosis, tuberculosis, rabies, anthrax, bird flu, swine flu, leptospirosis and toxoplasmosis. Questions included were also on animal hygiene, personal hygiene and training and awareness need on zoonoses. The collected data was properly analyzed for descriptive statistics viz. frequency and percentage. The knowledge of the importance of major zoonotic diseases was presented in the form of binary variable (yes = 1 & no = 0) and taken as the dependent variable, whereas occupation and level of educations were taken as explanatory variables as described by *Tesfye et al. (2013)*.

## RESULT AND DISCUSSION

*Socio - demographic characteristics:* The women respondents included in the study were from rural and urban areas of Pune and Satara Districts of Maharashtra. Equal numbers of respondents i.e. 150 each from rural and urban settings were involved in the survey. They were distributed in the three main age groups viz. young (up to 35), middle age (36-50), and old age group (above 51 years). Out of 300 respondents, 104 (34.66%) were in the young age group, 119 (39.66%) were in the middle age group and 77 (25.66%) were from old age group (Table 1). Majority of the women were housewives (49.33%) and only 27.67% respondents were contractual or permanent employee. Level of education recorded was illiterate (1.67%), primary schooling (25.33%), secondary and higher secondary schooling (29.33%), graduate and above (43.67%). The study group was heterogeneous and such heterogeneity is essential to discriminate understanding levels on the basis of education and urban/rural background. Percentage of women associated with agriculture farming was 17.33 per cent. Self employed women or undertaking their own enterprise were 3.33 per cent and 2.33 per cent were daily wage labour. Thus disparate nature was also recorded in terms of their occupation.

**Table 1. Socio-demographic characteristics of the respondents (N =300)**

Characteristics	No.	%
<b>Age</b>		
Young (up to 35 yrs)	104	34.66
Middle(36 to 50yrs)	119	39.66
Old (Above 50 yrs)	77	25.66
<b>Education</b>		
Illiterate	05	01.67
Up to primary	76	25.33
Primary to high School	88	29.33
Above high school	131	43.67
<b>Occupation</b>		
Housewives	148	49.33
Entrepreneurs	10	03.33
Farming	52	17.33
Service	83	27.67
Labour	07	02.33

*Knowledge and awareness on food borne and other zoonoses:* Observations were interpreted for five main categories as given in Table 2.

*Knowledge of modes of disease transmission:* Fairly good knowledge about role of water (57.66%), food (63.66%) and animal bite (60.33%) as sources of disease transmission was revealed. However, information on other routes of zoonoses transmission viz. direct contact (38.67%), vectors (30.33%) and inhalation (30.67%) was poor. Among vectors, role of mosquitoes and flies in harboring pathogens was known to the respondents; however they were less aware about significance of tick and flea. Knowledge level on the role of animals and animal associated diseases of public health significance was low. Except tuberculosis, rabies, bird flu and swine flu, respondents were totally unaware about anthrax, brucellosis, Q fever, bovine tuberculosis, leptospirosis, listeriosis, toxoplasmosis, hydatidosis and taeniasis and their modes of transmission. These observations are in similar correlations to the findings of *Swai et al. (2010)*; *Tesfaye et al. (2013)*; *Sandhu and Singh, (2014)*; *Cakmur et al. (2015)* and *Lindahl et al. (2015)*.

*Knowledge of food borne diseases:* The purpose of study was also to relate the knowledge level of diseases transmitted through contaminated food. All the respondents were aware about diarrhea, typhoid and cholera. However, they were not familiar with food borne listeriosis, bacillary diarrhea, *Bacillus cereus*

**Table 2. Awareness about various zoonotic and food borne diseases (N = 300)**

Particulars	No.	%
<i>Knowledge of Modes of disease transmission</i>		
Water	173	57.66
Food	191	63.66
Animal bite	181	60.33
Direct contact	116	38.67
Vector	91	30.33
Inhalation	92	30.67
<i>Knowledge of causes of diseases</i>		
Bacteria	184	61.33
Virus	112	37.33
Fungi	53	17.67
Rickettsial	01	0.33
Parasitic	08	02.67
<i>Knowledge of vector borne diseases</i>		
Dengue	294	98.00
Chickengunya	285	95.00
Malaria	287	95.66
JE	00	00
Q fever	00	00
Leishmaniasis	00	00
Trypanosomiasis	00	00
<i>Knowledge of zoonotic diseases</i>		
Anthrax	25	08.33
Brucellosis	02	0.67
TB	285	95
Listeriosis	00	00
Leptospirosis	02	0.67
Rabies	280	93.33
JE	02	0.67
Bird flu	290	96.67
Swine flu	296	98.67
Toxoplasmosis	00	00
Hydatidosis	00	00
Taeniasis	00	00
<i>Knowledge of food borne zoonotic diseases</i>		
Listeriosis	00	00
Colibacillosis	00	00
Salmonellosis (Typhoid Fever)	21	07.00
Cholera	34	11.34
<i>Bacillus cereus</i> poisoning	00	00
<i>S. aureus</i> intoxication	00	00
<i>Knowledge of diseases causing abortion</i>		
Knowledge of foodborne zoonotic infection	01	0.33
Listeriosis	00	00
Brucellosis	01	0.33
Campylobacteriosis	00	00
Toxoplasmosis	00	00

poisoning, intoxication due to *S. aureus* and botulism. Knowledge of food borne viruses was nil in the studies heterogeneous group which is really surprising. Etiological agents known to the respondents were bacteria (61.33%), viruses (37.33%), fungi (17.67%) and parasites (2.67%). About 86% respondents suffered from food borne illness some time in their life, but only 18.33 per cent women had knowledge about food borne zoonoses. These findings are supported by *Hundal et al. (2016)* and *Zhang et al. (2016)* and they have also recorded poor level of knowledge about risk of zoonotic diseases.

*Knowledge of pathogens causing abortion:* This question was totally new and surprising for the respondents and all of them were unaware about the fact that few zoonotic pathogens do cause abortion and may be transmitted through foods of animal origin. Food borne zoonoses causing abortions like brucellosis, Q fever, listeriosis, toxoplasmosis and campylobacteriosis were totally unknown to them.

*Knowledge of animal borne zoonotic agents:* In general 203 (67.67%) women respondents agreed that animals and birds may transmit diseases to human like rabies, bird flu and swine flu. Other important zoonoses prevalent in India viz. anthrax, brucellosis, bovine tuberculosis, echinococcosis, leptospirosis, Japanese encephalitis, rota virus infection and taeniasis was not known to any of the respondents.

*Knowledge of vector borne zoonoses:* Role of vectors like mosquitoes and flies was well understood in the women. Respondents were very much familiar with vector borne diseases viz. Dengue (98.67%), chikungunya (95.00%) and malaria (99.33), whereas they were unaware about other vector borne zoonoses of India viz. Japanese encephalitis, Q fever, leishmaniasis and trypanosomiasis. These finding was found supported with findings of *Zhang et al. (2016)*.

Exact co-relation of present findings could not be made since the study was undertaken on women and no such references are available for discussion. However, few studies have been carried out on knowledge, attitude, awareness and perception of zoonoses in general population including farmers (*Swai et al., 2010; Tesfaye et al., 2013; Sandhu and Singh, 2014; Cakmur et al., 2015; Lindahl et al., 2015*). Knowledge gap on zoonotic diseases, modes of transmission and its impact on human health has been

observed in the study and findings are in agreement with few researchers (*Hundal et al., 2016 and Zhang et al., 2016*). Zoonotic agents are principally maintained in animal reservoirs without showing clinical manifestations in them except for few diseases. Living in close proximity with animals including pets and birds pose a risk of acquiring such agents, therefore knowledge of major zoonoses and its management through personal and environmental hygiene, occupational safety is essential for the masses. Women are at major risk of zoonoses in Indian context, since they are playing vital role in agriculture, animal husbandry and household activities. Rabies, tuberculosis, bird flu and swine flu are the most frequently known zoonoses among the respondents in the study area. However, lower level of knowledge about other major zoonoses was revealed in them. Good knowledge of rabies, TB, bird flu and swine flu could be due to the facts that; rabies and TB are hyperendemic in India. Several cases and deaths due to swine flu has been recorded in Pune and adjoining districts in last five years. Similarly, mass campaigning on television and radio about bird flu and consumption of chicken was done during preceding years.

Good degree of awareness about rabies and brucellosis was observed in the livestock farmers of India by *Hundal et al. (2016)* and about brucellosis in Tanzania by *Zhang et al. (2016)*. Study on perception of zoonotic diseases in Southwest Ethiopia conducted by *Tesfaye et al. (2013)* revealed very low level of awareness by the public about major zoonotic diseases viz. anthrax, bovine tuberculosis, brucellosis, echinococcosis and taeniasis signifying the need for public health promotion through education and inter-disciplinary one health approach with close collaboration among veterinarians, public health practitioners and policy makers. Observations of the present study are in agreement with *Tesfaye et al. (2013)* as knowledge of women towards aforementioned zoonoses, its public health risk and management recorded very low. Thus, there is an immediate need of strengthening public health extension services with involvement of veterinarians for mass awareness on zoonoses in Indian context.

Misconception regarding swine flu and role of pigs in transmission of this flu virus as that of poultry birds in bird flu transmission was noted. Such false perception needs to be ruled out as human to human transmission is common in case of swine flu and actual role of pigs in

present scenario is nil. These observations are in compliance to the findings of *Hundal et al. (2016)* in which most of the farmers listed role of pigs in transmission of swine fever. Relatively more awareness on zoonotic diseases like brucellosis, leptospirosis, Q fever and malaria was recorded in the study of *Zhang et al. (2016)* conducted in Moshi, Tanzania. It could be due to difference in the type respondents. Their respondents were human health practitioners and livestock health providers. Respondents of present study were randomly selected women and they were not much familiar with the indirect modes of disease transmission, vector borne zoonoses, food borne agents causing abortion and other major zoonotic diseases prevalent in India.

Evaluation of farmers knowledge, attitude and practice about zoonotic diseases in Turkey was also done by *Cakmur et al. (2015)* and they have highlighted the necessity of informative training which may insure a change in the practices regarding zoonotic diseases for individuals. In contrast to the present observations, *Sandhu and Singh (2014)* noted high degree of awareness in the dog owners of Ithaca, New York about leptosirosis, giardiasis, rabies, hook worms, toxoplasmosis, leishmaniasis and low level of awareness about vector borne zoonoses transmitted by mosquitoes, ticks and fleas. This was relating to lack of practice among veterinarians to discuss on zoonoses canine diseases with their clients. Fairly good knowledge about role of vectors especially mosquitoes and flies and excellent awareness of dengue, chikungunya and malaria was recorded in this study. But poor awareness was observed in case of Japanese encephalitis, Q fever, leishmaniasis and trypanosomiasis.

## CONCLUSION

It was very clear from the present findings, that there was poor knowledge of zoonotic diseases among the women of Pune and Satara districts irrespective of their demographic placement i.e. urban or rural, education and occupation. Majority of them showed willingness to undergo awareness programs on zoonotic and food borne diseases and knowledge of zoonoses would be important for them. Poor zoonotic awareness and high risk behaviour necessitate the inculcation of Veterinary Public Health education as a part disease control programmes with special reference to women.

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