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*Zoonoses and Food Hygiene News, published four times a year, provides a medium for disseminating technical information on matters related to zoonoses and food hygiene generated in the world, particularly in Nepal. The editors welcome submissions on these topics with appropriate illustrations and references. The views and opinions expressed in the News are those of the authors.*

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## **Review on Epidemiology of Influenza Virus and Bird Flu/Avian Influenza Virus**

Dr. D. D. Joshi, Executive Chairman, NZFHRC

Influenza virus is a viral zoonotic disease, which is prevalent in most of animals species and bird species. There are 1,709 infectious organisms pathogenic to humans of which 49% are zoonotic which means transmitted from animals to humans, whereas of the 156 considered "emerging" diseases of which 73% are Zoonotic (Taylor et al., 2000). Pandemic influenza virus of animals transmissible to human remains a key threat not only to developed countries but also developing countries as well (Webster 1998). Number of key emerging infectious diseases over the past two decades has fostered a quiet revolution in our approach to infectious disease research, surveillance and control (Daszak et al., 2001). The emergence of a range of pathogenic diseases coincided with the development of increasingly close relationship with domestic animals (Dobson et al., 1996). There are a little over 1,000 different species, including fresh, brackish and sea aquatic birds, representing some 10% of the whole class biodiversity, which do play a special role in influenza virus epidemiology (Moutou Francois 2001, Webster 1998, Lesaffre 2000, Dorst 1995, Webster et al., 1994, Stallknecht et al., 1988). In 1878 "fowl plague" which has 100% mortality in domestic fowl was first distinguished from bacterial diseases. Since 1981 this disease has been termed highly pathogenic avian influenza (HPAI) (Alexander 2001).

Since 1959 till to date there have been more than 25 reported HPAI virulent viruses isolated from domestic birds –poultry, ducks and turkeys in different countries which are as follows (Alexander 2001, Joshi 2005):

A/chicken/Scotland/59 (H5N1), A/turkey/England/63 (H7N3), A/turkey/Ontario/7732/66 (H5N9), A/chicken/Victoria/76 (H7N7), A/chicken/Germany/79 (H7N7), A/turkey/England/199/79 (H7N7) A/chicken/Pennsylvania/1370/83 (H5N2), A/turkey/Ireland/1378/83 (H5N8), A/chicken/Victoria/85 (H7N7), A/turkey/England/50-92/91 (H5N1), A/chicken/Victoria/1/92 (H7N3), A/chicken/Queensland/667-6/94 (H7N3), A/chicken/Mexico/8623-607/94 (H5N2), A/chicken/Pakistan/447/94 (H7N3), A/chicken/NSW/97 (H7N4), A/chicken/Hong Kong/97 (H5N1), A/chicken/Italy/330/97 (H5N2), A/turkey/Italy/99 (H7N1), A/chicken/Hong Kong/2000 (H5N1), A/chicken/Thailand/2001 (H5N1), A/duck/Vietnam/2002 (H5N1), A/chicken/China/2003 (H5N1), A/chicken/Vietnam/2004 (H5N1), A/chicken/Thailand, Vietnam, Laos, Cambodia, China/2005 (H5N1).

Sometime Low Pathogenic Avian Influenza (LPAI) becomes HPAI because of virus mutation as for example during 1999 in Italy high mortality was often recorded in young turkeys, reaching 97% in one flock (Capua et al., 1999-2000, Garcia et al., 1996, Perdue et al., 1998). During March-May 1997 outbreaks of H5N1 HPAI occurred on three farms in Hong Kong with mortality rates of 70-100% (Claas et al., 1998). AI virus is a disease of type A infected in domestic and wild birds (Swayne et al., 2000). HPAI infection in bird was recorded in 1878 by Perroncito in Italy, which was called fowl plague (Stubbs et al., 1948). Which was then determined by several scientists disease of HPAI in birds causing type A influenza (Schafer, 1955, Bankowski, 1981, Easterday et al., 1978, Beard et al., 1973 and Slemons et al., 1974). This HPAI appeared suddenly with 15 outbreaks as a severe multi-systemic disease with high mortality rates in different countries since 1955 to till to date (Swayne et al., 2001). In 1918 Swine influenza (SI) was first recorded in US, Hungary and China (Brown 2001, Alexander 1982, Webster et al., 1992, Chun 1919, Coen JS 1919, Gorman et al., 1991, Reid et al., 1999, Reid et al., 2000, Shope 1931). In 1989 the largest outbreaks of equine influenza (EI) worldwide have occurred in China (Chambers et al., 2001, Judson 1874, Heller et al., 1957, Waddell et al., 1963), Risk factor for recent influenza virus disease outbreaks in animals should be identified not only for HPAI or EI or SI but all other animal influenza virus diseases of paramount importances for all developing and developed countries with a highly developed poultry production sector as well as backyard small scale poultry production system. All countries should conduct surveillance system on the basis of guidelines given by OIE/FAO/WHO (Chillaud 2001, OIE 1994, 1999 and 2000). Since 1960's EI inactivated vaccines have been available for immunization in horses since then this vaccine has been used during last 3 decades in Europe and Americas and also in UK and Hong Kong and because of this EI disease outbreaks has been stopped (Mumford 2001, Bryans et al., 1966, Mumford et al., 1993, Cook et al., 1998, Wood et al., 1998, OIE 1998, Oxburgh et al., 1994, 1999 and Powell et al., 1995).

Developing vaccines against potential pandemic influenza viruses will be urgent need for a vaccination and control of human infection with influenza A (H5N1) and A (H9N2) viruses. There should be strategies for vaccine production given by WHO pandemic plan phases 0 and possibly 1 (Wood 2001, WHO 1999). Swine influenza (SI) was first recognized as a new disease entity

during the great human influenza pandemic of 1918, (Brown, 2002). It was called as "hog flu" by veterinarians in the north-central region of the US, due to the similarity of lesion seen in pigs and humans (Dorset, 1922). The classic H1N1 swine influenza virus (SIV) was first isolated in 1930 (Shope, 1931). Isolation of the human H1N1 influenza virus followed in 1933. Beginning in 1976 swine flu was recognized with increasing frequency in many swine producing regions of the world. Based on molecular and antigenic analysis, SI could be caused by several strains of types A influenza virus, including classic H1N1, avian – like H1N1, human – origin H3N2 and H1N2 recombinants of classic swine H1N1 and human like swine H3N2 viruses (Urairong K. 2005). Host range of influenza viruses by HA-NA combinations and by species include: Humans: H1N1, H2N2, H3N2, (H5N1, H9N2), Swine: H1N1, H3N2, H1N2 (H9N2, H4N6, H1N7), Equine: H3N2, (H7N7), Avian: All 15HA and all 9NA subtypes in most combinations (135 potential HA-NA combinations) H5N1-HPAI (Slemons, 2002).

Bird flu is also called Avian Influenza. It is caused by an RNA genome group of virus. It has three recognized types A, B and C. From the epidemiological point of view, there are two antigens involved in the infection: one hemagglutinin (H) antigen and the other Neuraminidase (N) antigen. Their subtypes are from H1 to H12 and N1 to N9 antigen recognized so far (WHO, 1980).

First time during the year 1918, 1957 and 1968, there were large epidemics and pandemics due to type A/H1N1/H2N2 Asian virus from pig to human in the United States of America, USSR and Asian countries. About 70 million human cases were recorded sick and about 20 million people died worldwide. During the outbreak in the year of 1957-1958 and 1968-1969, a virus type: A/Hong Kong/68 (H3N2) caused flu in about 62,000 people and 27,900 people died due to influenza virus in the United States of America alone respectively. During 1978-1979, a virus strain A/Swine/Hong Kong/3/4/76 was recorded in Europe, USA, USSR, Latin America, Canada and Asia (Nakajima et al., 1982 and Pensaert et al., 1981).

Equine influenza virus subtype A/Equine/Prague/1/56 (H7N7) was isolated in Czechoslovakia and second subtype A/Equine/Miami/1/63 (H3N8) was isolated in the USA, Canada, Latin America, Brazil, Hong Kong and also in Europe, Japan and other Asian countries. During the year 1983-1984, virus subtypes avian influenza: A/Avian/Hong Kong/68/H3N2, H7N7, H5N2, H5N1 were isolated in USA, Hong Kong, Latin America, USSR and other Asian countries. In USA in 1983 only, about 11 million birds died or were killed due to infection and 1,25,593 additional birds also died in USA during the year 1984.

Since 1998-2005, this bird flu/avian influenza virus type A and subtypes were being widely spread in almost all continents of the world. There are high morbidity and low mortality human cases recorded. However, millions and millions of birds died or were sacrificed, due to which hundreds of farmers were out of poultry business and the economy of the country went down. During the year 1997, there was an outbreak of H5N1 in birds in Hong Kong and 6 people died and 18 were cured. In 2003, same subtype virus H5N1 occurred in birds and 83 people got this flu and a person died (WHO/FAO/OIE 1984). During the year 1997/1998 to 2003, outbreaks were recorded in South Korea, Vietnam, Japan, Netherlands and Hong Kong. Many infected birds died while others were killed and sacrificed.

Bird flu is a deadly disease prevalent in poultry and ducks of Asian countries, which poses a risk of pandemic that can cause far greater loss of human beings than Severe Acute Respiratory

Syndrome (SARS). There is a serious risk to the poultry keeping countries either developed or developing. This virus might persist in the environment and in bird flocks and sheds for many years. Besides poultry, quails and ducks can act as reservoirs and also are capable of excreting large amount of H5N1 viruses into the environment without showing any clinical symptoms (Fujita, 2005).

During 2003, bird flu and H5N1 virus have been discovered in nine countries of South East Asia, viz. North Korea, Vietnam, Cambodia, Thailand, China, Indonesia, Japan, Laos and South Korea (Jutzi, 2003). The main problem with this viral disease is that the flu virus can mutate easily into a form that spreads among people and could cause global epidemic or pandemic both in birds and in humans.

In Nepal, so far this bird flu or swine flu virus has not been seen both in birds (poultry, ducks, quails), captive or migratory, and pigs. However, there is always a danger of importing this disease through the importation of live day old chicks, eggs and chickens into the country from the infected countries like Thailand and China, Hong Kong and Taiwan. Therefore, His Majesty's Government of Nepal should act urgently on the following points to control the spread of this deadly disease in poultry industry as well as in humans.

- Bird Flu Prevention Taskforce formed jointly by Department of Health Services, Ministry of Health, Department of Livestock Services, Ministry of Agriculture and the Co-operatives should organize a meeting soon and finalize the Pandemic Bird Flu Plan.
- The quarantine check-posts at the border area of the country and at the airports should remain alert and work round the clock.
- The government should impose a ban on the import of live chicks and eggs of ducks and poultry from the infected countries.
- The departments should carry out the survey of the disease in animals and humans jointly or individually and the report should be made public.
- Debate about the ways to protect the poultry industry in Nepal from H5N1 virus should be started soon and we should head for implementation after amassing the instruments for prevention.
- His Majesty's Government and the public should not keep in mind that the disease does not spread to the humans if the ducks and poultry are destroyed but should look for preventive or immunizing measures both in humans and the animals.
- Epidemiological surveillance, case detection in birds and humans.
- Ban or control of movements of domestic animals and birds inside and outside the country.
- Nepal task force on bird flu must make a plan to seek international support and to control it as early as possible, in case disease outbreak occurs.

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**Proposal and Report Writing Training Workshop of all Stakeholder of Ward 19 and 20 of KMC**  
*Urban Eco System Health Project Phase – II*  
*Supported by: IDRC, Ottawa, Canada*

**Objective of the Training Workshop:**

The overall objectives of the training workshop are "how we could develop a good need based proposal, how we can generate the resources for launching different activities and finally how to

prepare a good and effective report. On that basis, following are the specific objectives of the training:

- To describe the meaning, objectives and the importance of proposal
- To describe the necessary elements for a good proposal
- To find the necessary materials to develop a proposal
- To develop a good proposal according to the needs
- To describe the meaning and importance of a report
- To identify the main elements of a good report
- To develop a good report according to needs and the nature of work

#### Course Contents for Proposal Training Workshop

- Opening/Icebreaking
- Leveling of expectation, norms setting
- Concept of Development/Project and Challenges
- What is a Proposal?
- What are the Elements of an effective proposal?
- Topic selection situation analysis (Technical Section)
- Problem Analysis (Technical section)
- Setting objectives (Technical section)
- Formulation Strategy (Technical section)
- Human Resources Organization (Management section)
- Monitoring and Evaluation (Management section)
- Exercise on Financial Section
- Preparation of proposal and presentation
- What is Report?
- Why to write a report?
- Elements of a report?
- Exercise on Report Writing and Presentation.
- Program Evaluation and Closing

#### Inauguration and Introduction:

On behalf of NZFHRC, Ms. Minu Sharma, Program Officer welcomed all the participants and the facilitator. Dr. Durga Datt Joshi, Executive Chairman of NZFHRC, welcomes all the participants and cleared objectives of the training and the logistic matter as well. Later on, he delivered his valuable speech to successfully completion of the training. He also mentioned that this training would play a vital role in their respective work unless you will use the learnt skill and techniques in your real life situation. Now the working patterns of different organizations have changed. You all have run the program for the target group by submitting the good proposal to the external funding agencies not only to NZFHRC, but also to KMC, Ward office, World vision and other different line organizations, hence it is a big challenge and at the same time, it is a big opportunity as well for us. Hence, I am very hopeful that this training will conducted in a harmonious and friendly way. I hope you all will take part actively and provide your valuable time, knowledge and effort to make success of this training. After the valuable speech for the successful completion of the training by the executive Chairman, the forum was handed over to the facilitator Mr. Rajendra Gupta. A Metacard method was carried out to introduce the participants and facilitators to each other. The duration of the training workshop were 5 days. The detail report of the training workshop has been published separately by NZFHRC.

The participants were divided into 5 groups. Each group prepared and presented a full project proposal for future implementation purpose. The project titles are as follows:

**Group – 1: Wards and Community Urban Health Clinics jointly of wards 19 and 20 KMC "Proposal on the Expansion of immunization, family planning services and DOTS at Community Urban Health Clinic of wards 19 and 20, 2062"**

**Group – 2: Maruhiti and Nhupucha Clubs Jointly of wards 19 and 20 KMC "Proposal on Workshop on Drug Abuse and HIV/AIDS for Parents "**.

**Group – 3: Street Vendors and Small Tea shop jointly of Wards 19 and 20 KMC "Proposal on Establishment of Flower Nursery for Poverty Alleviation and Environmental Protection".**

**Group – 4: Squatter Society and Sweeper Society jointly of wards 19 and 20 KMC "A Proposal on Expansion of Community Tap Water at Ramghat"**

**Group – 5: Nepal Khadgi Sewa Samiti and Nepal Masu Byabasayi Samiti jointly wards 19 and 20 Jointly KMC "A Proposal on Sewing Training for Youth Man and Women"**

#### **Free Dog Rabies Vaccination in Chitwan District**

This is going to be organized jointly with Bharatpur municipality, Ratnanagar municipality, Department of Livestock Services and Department of Health Services and our centre NZFHRC with the support of Donative Unit for Rabies Vaccine to Nepal Tokyo, Japan. The tentative schedule is mentioned below:

#### **Dog Rabies Vaccination Schedule for Bharatpur and Ratnagar Municipality of Chitwan District (2006)**

**Vaccination Tme: 7 Am to 12 Noon**

<b>Bharatpur Municipality</b>		
<b>Date of Vaccination</b>	<b>Ward no.</b>	<b>Vaccination Centre</b>
May 14, 2006	1 and 2	Bharatpur Municipality 2 Ward Office
May 14, 2006	3, 4 and 5	Mini Bus Park 5 Ward Office
May 15, 2006	6	Anandapur Chautara
May 15, 2006	7, 13 and 14	Tiger Chowk Bharatpur Municipality 7 Ward Officer
May 16, 2006	8 and 9	Saradpur Sec. School Chautaro
May 16, 2006	11 and 12	Jagriti Rastriya Pri. Sc. Chautaro
May 17, 2006	10	Bharatpur Municipality Office
<b>Ratnanagar Municipality</b>		
May 17, 2006	8, 9, 10, 11, 12 and 13	Panchakanya Health Post Officer
May 18, 2006	1, 2, 3 and 4	Near Ratnanagar Municipality Office
May 18, 2006	5, 6 and 7	Mohana Chowk Mohana Secondary School

#### **Drinking water Quality Analysis Result Report of Different Wards Offices of KMC**

<b>Ward</b>	<b>Water parameter and Result</b>												
	<b>pH</b>	<b>T. H</b>	<b>T. A</b>	<b>C. H</b>	<b>Ca</b>	<b>Mg</b>	<b>M. H</b>	<b>Cl</b>	<b>As</b>	<b>NH<sub>4</sub></b>	<b>F</b>	<b>Mn</b>	<b>Do</b>
6	6	20	14	14	5.6	1.4	6	20	Nil	2	6	1	22
7	8	36	38	30	12	1.4	6	12	Nil	6	2	1	30
8	7	42	46	30	12	2.9	12	16	Nil	4.2	2	1	32
9	6	36	32	30	12	1.4	6	16	Nil	4.2	2	1	27
10	6	34	38	26	10	1.9	8	20	Nil	4.2	2	1	36
11	8	42	40	32	13	2.4	10	20	Nil	4.2	2	1	30
12	7	44	40	32	13	2.9	12	16	Nil	4.2	2	1	31
14	6	38	36	30	12	1.9	8	16	Nil	3.4	2	1	30
15	6	36	28	26	10.4	2.4	10	14	Nil	4.2	2	1	32
17	6	38	34	30	12	1.9	8	16	Nil	4.2	2	1	32
18	8	36	34	34	13.6	0.48	2	22	Nil	4.2	2	1	31
19	7	36	38	26	10.4	2.4	10	16	Nil	4.2	2	1	33
20	7	38	36	28	11.2	1.9	8	16	Nil	3.4	2	1	31
32	6	30	30	20	8	2.4	10	24	Nil	2.5	6	1	26
33	6	38	34	30	12	1.9	8	18	Nil	3.4	2	1	27
35	6	8	6	6	2.4	0.48	2	10	Nil	4.2	2	1	31

**Drinking water Quality Analysis Result Report of different  
Community Urban Health Clinics of KMC**

Ward	Water parameters and Result mg/l												
	pH	T. H	T. A	C. H	Ca	Mg	M. H	Cl	As	NH <sub>4</sub>	Fe	Mn	Do
7	7.21	44	38	30	12	3.4	14	10	Nil	5	2	1	33.6
8	5.96	26	32	14	5.6	2.9	12	26	Nil	3.4	6.6	1	22.2
10	6.08	48	38	39	13.6	3.4	14	22	Nil	5.1	2	1	35.6
15	7.58	172	148	154	61.66	4.3	18	24	Nil	2.5	4	1	30.3
19	7.16	32	30	28	11.2	0.97	4	18	Nil	5.1	2	1	36.6
20	7	38	36	28	11.2	1.9	8	16	Nil	3.4	2	1	31
28	6.84	36	48	28	11.2	1.9	8	22	Nil	5.1	4	1	29.1
32	6.47	30	30	20	8	2.4	10	24	Nil	2.5	5.6	1	25.7
35	6.53	84	50	50	20	8.25	34	66	Nil	4.2	2	1	28.1

N.B.:

pH – Potential of Hydrogen, T.H. -Total Hardness  
T.A. -Total Alkalinity, C.H. -Calcium Hardness  
Ca –Calcium, Mg –Magnesium, M.H. -Magnesium Hardness, Cl  
–Chloride, As –Arsenic, NH<sub>4</sub>–Ammonia, Fe – Iron, Mn –  
Manganese, Do -Dissolved Oxygen

**NEWS:**

**Free Eye Camp:**

Free eye camp was organized on 1<sup>st</sup> April 2006 at ward 20 Community Urban Health Clinic jointly by World Vision International, Nhu Puch Club, Youth Club and NZFHRC about 400 people got free eye examination and free treatment.

Free Dog Rabies Vaccination camp was organized on 10 May 2006 at ward 19 and 20 Office organized under Urban Ecosystem Health Project Phase – II. Supported by International Development Research Centre (IDRC), Ottawa, Canada and Donative Unit for Rabies Vaccine to Nepal, Tokyo, Japan.

**Bird Flu (Avian Influenza):**

A book on Review on Pandemicity of "Bird Flu" by Dr. Durga Datt Joshi, Executive Chairman, NZFHRC published by NZFHRC in January 2006.

Although till to date this bird flu has not yet reached into Nepalese bird population even then it was essential to know more about this virus before it gets into the country.

Therefore I have tried to review this bird flu virus outbreak status not only of Nepal but also globally including the FAO/WHO/OIE/World Bank/Asian Development Bank and other actions taken. It was an urgent need to review the situation of influenza virus outbreaks globally to understand how serious this disease in different continent of the world? Based on the information published in different medias, institutions, countries reports, conferences proceeding, UN organizations like WHO, FAO and OIE guidelines developed, I have tried to review all together in one book form. I am sure this will give clear idea not only to the English reader but also to the Nepalese readers about the influenza virus in general and avian influenza (bird flu) in particular. Please read this book and use it as much as possible so that you can disseminate this knowledge of influenza virus to your friends, family members and other scientists interested that way bird flu will be controlled by mass awareness and precautionary participatory approach method.

**World Society for the Protection of Animals (WSPA) Symposium 2006:**

WSPA Symposium 2006 will be hosting a Global Animal Welfare Symposium to coincide with WSPA's 25<sup>th</sup> Anniversary in London 7-9 June 2006. This unique event will bring together member societies from around the world to unite the animal welfare movement and to focus our energies for the future. This symposium will aim to equip delegates with new ideas, information and inspiration that will strengthen all our animal welfare programmes and promote global co-operation. With internationally renowned speakers, and delegates from the WSPA Global Network of more than 600 member societies in over 130 countries, the symposium will address all the major issues being faced around the world. Topics will include farm animals, companion animals, wildlife issues and humane education. WSPA has invited the following person from the National Zoonoses and Food Hygiene Research Centre. They are representative of one of the WSPA's much respected Member Societies. Dr. Durga Datt Joshi, Executive Chairman, Ms. Minu Sharma (Joshi), Programme Officer, Mr. Shushil Prasad Neaupane, Board Member and Mrs. Purna Joshi, Board Member.

**K.D.M.A. Research Award for the year 2063 (2006)**

*Please kindly submit your research work paper on allergy for trust award consideration by the end of June 2006 to KDMART office Chagal, G.P.O. Box 1885, Kathmandu, Nepal, Phone: 4270667 and Fax 4272694. This award was established by Dr. D.D. Joshi in 2049 B.S. on the memory of his wife, the late Mrs. Kaushilya Devi Joshi. The award includes a grant of NRs. 10,001 with certificate.*

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**From: Zoonoses & Food Hygiene News, NZFHRC  
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**TO:**

**Dr/Mr/Ms .....**

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