

THE TIME BOMB CALLED BIRD FLU OR AVIAN INFLUENZA: WHAT SHOULD WE DO?

Dr Anthony Chacko

(National Trustee, Poultry Association of
Zambia)

Most recent out breaks of bird flu or Avian Influenza in Uganda, Zimbabwe and DR Congo serve Zambia as a wake-up call on time, and as a time- bomb which is ticking away close to our back yard. So, we should do everything possible to keep it away from our country.

Very recently there was an outbreak of Bird flu (Avian Influenza) in Cameroon. This is the first time the disease has been found in Central Africa since 2006. The havoc it unleashed in western Africa is manifold. In Nigeria itself, more than 3.5 million birds were dead or culled, from about 750 outbreaks so far.

The recent outbreak in Cameroon however raised serious concern that disease might be advancing **southward!** And it has become real when it hit Uganda, Zimbabwe and DR Congo recently.

While generally LPAI has subclinical infection in poultry and rarely infect humans. The current novel H7N9 is different in that it has had a high number of human cases with mortality in some cases.

Situation in Uganda: In November 2016 fishermen reported mass deaths of wild birds. The main species affected were the white-winged terns (*Chlidonias leucopterus*) on the shores of Lake Victoria in Wakiso District. The presence of HPAI H5N8 (High Pathogenic Avian Influenza) was confirmed and Uganda announced Influenza Type A serotype H5N8 outbreak to the public and international community on 15th January 2017. Cases

were confined to fishing villages along the shores of Lake Victoria. Poultry species that were affected are domestic Ducks and Chickens. Currently, the disease is in 3 districts.

HPAI Situation in DR Congo: The meeting was informed that this was the first time DRC had documented HPAI. Date of onset of poultry mortalities was April 2017 in North-Eastern Ituri Province of DRC. Fishermen saw carcasses of birds mainly palmipeds, dead and washed up on the coast. Ducks are mostly raised in these localities near Lake Albert. Mortality had been higher in ducks than in chickens. A total of 11 outbreaks had been reported from within in the affected Province with confirmation of HPAI H5N8. A total of 7,107 cases have been reported with 6,927 deaths in a susceptible bird population of 17,272. The case fatality rate was 97.47%.

Incineration of the dead birds was ordered and have been carried out by authorities. The outbreak was not yet resolved.

HPAI Situation in Zimbabwe: The outbreak was reported on 17th May 2017 and the locality of the outbreaks was Lanark, Beatrice, Seke, Mashonaland East. The affected farm was a parent breeding unit for broilers with 83,000 birds which has 8 separately managed. The units were at least 1Km apart and only 1 of the 8 units was affected. A total of 3,045 birds died within a week at the site showing signs consistent with Highly Pathogenic Avian Influenza and H5N8 confirmed. The farm had a total susceptible population of 2,000,000 birds with 8,228 cases and 8,228 deaths entailing a case fatality rate of 100%. It was thought that the outbreak may have originated from migratory waterfowl in a dam that is very close to the chicken houses where the first cases were detected. Efforts are currently underway to investigate presence of HPAI virus strains in wild waterfowl.

HPAI in Zambia: The country was currently free but at high risk due to the fact that there were migratory birds pathways traversing over the country; importation of infected poultry and poultry products especially through the porous border areas; mechanical transmission via people, vehicles and equipment from infected countries and possible human infections like was the case with H5N1 and H5N8.

Organizations such as World organization for Animal Health (OIE), Food and Agriculture Organization of the United nations (FAO) etc have been warning the neighbouring countries to be vigilant and continue their heightened surveillance and prevention efforts. International Egg Commission (IEC) has put up a communications network and experts group on AI in order to face this disease squarely. On the other hand, CDC,

United States of Agriculture (USDA), World Health Organization (WHO), etc focus on human health.

So far the main strain that causes Bird Flu or Avian Influenza (AI) H5N1 has brought about the death of tens of millions of poultry and losses of tens of billions of dollars worldwide.

More than 1.4 million birds were depopulated only In Hong Kong in 1997, and in 2001 the figure was more than 1.2 million birds. In Europe alone 30 million birds were destroyed in 2003.

Animal Health (OIE) who declared Bird flu as 'class A' disease targeted for emergency disease control measures is in fore front to offer countries assistance, such as risk assessments, contingency planning, technical advice etc.

Farmers, veterinarians and general public may want to get the answers for, on this very serious and interesting phenomenon called Bird Flu. Therefore, I am trying to respond to some of the possible questions that people from all walks of life, may have.

What is Bird Flu?

Avian influenza, "bird flu", or "fowl plaque" is a contagious disease of animals caused by viruses that normally infect birds and, less commonly, pigs. Avian influenza viruses are highly species-specific, but have, on rare occasions, crossed the species barrier to infect humans.

In domestic poultry, infection with avian influenza viruses causes two main forms of disease, distinguished by low and high extremes of virulence. The so-called "low pathogenic" form commonly causes only mild symptoms (ruffled feathers, a drop in egg production) and may easily go undetected. The "highly pathogenic form" is far more dramatic. It spreads very rapidly through poultry flocks, causes disease affecting multiple internal organs, and has a mortality that can approach 100%, often within 48 hours!

The route of infection is mainly orally (fecal- oral) and occasionally through conjunctiva or by respiratory route and the incubation period is only 3-5 days.

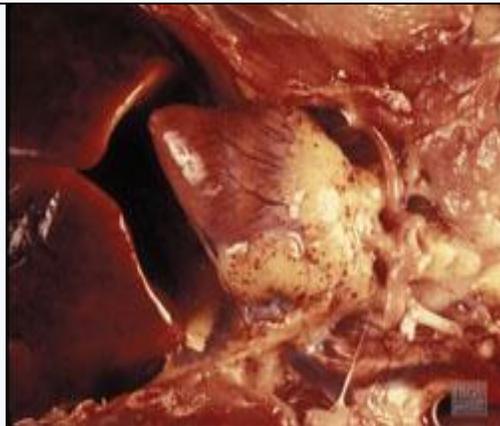
Major clinical signs are drop in production, neurological signs, swelling of combs and wattles, ruffled feathers, conjunctivitis, respiratory signs etc



Congested and markedly edematous head



Chicken's shanks are swollen (edema) and extensively reddened (hemorrhages)



Numerous epicardial petechiae in the heart



Diffusely reddened, wet, and swollen lung (congestion and edema)



Multiple hemorrhages in proventricular glands



Hemorrhages over peyer's patches in the intestine

Courtesy for the images: Dr David Swayne, USDA and Center for food security and public health (Iowa university, college of veterinary medicine.)

Post mortem lesions apart from mentioned earlier include petechiae in the heart, trachea, lungs, proventriculus and intestine etc, and severe inflamed hemorrhagic pancreas and spleen. However, virological and serological tests are necessary to diagnose. Viral antigen detection is one of the tests conducted commonly.

No specific treatment is found out so far. In fact outbreaks with highly pathogenic AI (HPAI) are controlled only by eradication.

Which viruses cause highly pathogenic disease?

Influenza A viruses have 16 H subtypes and 9 N subtypes. Only viruses of the H5 and H7 subtypes are known to cause the highly pathogenic form of the disease. However, not all viruses of the H5 and H7 subtypes are highly pathogenic and not all will cause severe disease in poultry.

On present understanding, H5 and H7 viruses are introduced to poultry flocks in their low pathogenic form. When allowed to circulate in poultry populations, the viruses can mutate,

usually within a few months, into the highly pathogenic form. This is why the presence of an H5 or H7 virus in poultry is always a cause for concern, even when the initial signs of infection are mild.

Do migratory birds spread highly pathogenic avian influenza viruses?

The role of migratory birds in the spread of highly pathogenic avian influenza is not fully understood. Wild waterfowls are considered the natural reservoir of all influenza A viruses. They have probably carried influenza viruses, with no apparent harm, for centuries. They are known to carry viruses of the H5 and H7 subtypes, but usually in the low pathogenic form. Considerable circumstantial evidence suggests that migratory birds can introduce low pathogenic H5 and H7 viruses to poultry flocks, which then mutate to the highly pathogenic form.

Recent events make it likely that some migratory birds are now directly spreading the H5N1 and H5N8 virus in its highly pathogenic form. Further spread to new areas is expected.

What changes are needed for H5N1 or H5N8 to become a pandemic virus? What are the implications for human health?

The widespread persistence of H5N1 or H5N8 in poultry populations poses two main risks for human health.

The virus can improve its transmissibility among humans via two principal mechanisms. The first is a “re assortment” event, in which genetic material is exchanged between human and avian viruses during co-infection of a human or pig. Re assortment could result in a fully transmissible pandemic virus, announced by a sudden surge of cases with explosive spread.

The second mechanism is a more gradual process of adaptive mutation, whereby the capability of the virus to bind to human cells increases during subsequent infections of humans. Adaptive mutation, expressed initially as small clusters of human cases with some evidence of human-to-human transmission, would probably give the world some time to take defensive action.

How do people become infected?

Direct contact with infected poultry, or surfaces and objects contaminated by their faeces, is

presently considered the main route of human infection. To date, most human cases have occurred in rural or peri-urban areas where many households keep small poultry flocks, which often roam freely, sometimes entering homes or sharing outdoor areas where children play. As infected birds shed large quantities of virus in their faeces, opportunities for exposure to infected droppings or to environments contaminated by the virus are abundant under such conditions. Moreover, because many households in Africa depend on poultry for income and food, many families sell or slaughter and consume birds when signs of illness appear in a flock, and this practice has proved difficult to change. Exposure is considered most likely during slaughter, de-feathering, butchering, and preparation of poultry for cooking.

Is it safe to eat poultry and poultry products?

Yes, though certain precautions should be followed in countries currently experiencing outbreaks. In areas free of the disease, poultry and poultry products can be prepared and consumed as usual, with no fear of acquiring infection with the H5N1 virus.

In areas experiencing outbreaks, poultry and poultry products can also be safely consumed provided these items are properly cooked and properly handled during food preparation. H5N1 virus is sensitive to heat. Normal temperatures used for cooking (70⁰C in all parts of the food) will kill the virus. Consumers need to be sure that all parts of the poultry are fully cooked (no “pink” parts) and that eggs, too, are properly cooked (no “runny” yolks).

Consumers should also be aware of the risk of cross-contamination. Excretions such as saliva or any fecal material from raw poultry and poultry products should never be allowed, during food preparation, to touch or mix with items eaten raw. When handling raw poultry or raw poultry products, persons involved in food preparation should wash their hands thoroughly and clean and disinfect surfaces in contact with the poultry products. Soap and hot water are sufficient for this purpose.

In areas experiencing outbreaks in poultry, raw eggs should not be used in foods that will not be further heat-treated as, for example by cooking or baking.

Avian influenza is not transmitted through cooked food. To date, no evidence indicates that anyone has become infected following the consumption of properly cooked poultry or poultry products, even when these foods were contaminated with the H5N1 virus.

Does the virus spread 'easily' from birds to humans?

No (fortunately!). Though a number of human cases have occurred in some out breaks in the past, this is a small number compared with the huge number of birds affected and the numerous associated opportunities for human exposure, especially in areas where backyard flocks are common. It is not presently understood why some people, and not others, become infected following similar exposures. But the recent outbreaks in the region of H5N8 are scary!

Prevention and Biosecurity measures?

- **All-in all out system of rearing poultry is the key to prevent its spread.**
- **Try your best to prevent contact with wild birds or their water sources.**
- **Avoid any exposed water sources in and around poultry farms.**
- **Even open water reservoirs or tanks can be a source of infection, where in wild birds, water fowls or migratory birds can come to for drinking.**
- **Do not allow birds taken from the farm for sale to return from the live markets.**
- **We need to strictly follow depopulation of infected birds.**
- **Immediately notify the veterinary department if you find any possible signs of infection.**
- **Dispose the dead birds by burying, composting or burning (if possible, incinerating).**
- **Follow Biosecurity measures strictly.**
- **Poultry men should be aware of all necessary Biosecurity measures.**
- **Providing foot bath at the door of each poultry pen with disinfectant, washing the boots with disinfectant when any one enters the pen are some of the best Biosecurity practices.**
- **Give utmost attention on cleaning and disinfection.**
- **Care should be taken not to introduce any sick bird to your premises.**
- **No unwanted visitor/s in to your premises, please.**

Vaccinating the birds, not done routinely. The virus shedding by the birds to the atmosphere may not be prevented by vaccination. Inactivated vaccines have been tried with varying results but the vaccinated birds are found to be carriers if exposed to the infection. Nevertheless, It is a good idea to vaccinate at least all free range and village poultry which can be in contact with wild birds.

Disinfecting farm premises and poultry houses should strictly be carried out using the best disinfectants. Sodium hypochlorites, quaternary ammonium compounds, phenols, poly dimethyl ammonium Chloride etc. are some of them.

The government of Zambia needs to prohibit (if not done so far!) all genetic live or meat imports derived from poultry originating from the country, or in some cases the region, declaring the outbreak, effective until it regains its avian influenza free status , at least six months after the last declaration.

The Government should immediately review (if not done so far!) the rules of the OIE in order to adapt the regulations to the new reality on hand.

In Zambia, to all the poultry farmers: kindly emphasize and strengthen all your hygiene and bio-security measures as mentioned above in this write up in order to safeguard the animal and human populations of Zambia. Any laxity in this area can be very expensive!

Reference: Various publications of G.D animal health Service, The Netherlands;

Akzo nobel's response plan on AI;

Publications from Food and Agriculture Organization (FAO);Communications from International Egg Commission (IEC) and Animal Health (OIE);

Recent discussions with Dr Caesar Lubaba, Chief epidemiologist, Government of Zambia and

Prof. A. Mweene (UNZA-SVM-DISEASE CONTROL);

Various communications from International Egg Commission (IEC);

Proceeding of a recent meeting on National Response Plan (NRP) on Avian Influenza , on 22nd June 2017, at the office of Director-Veterinary services, Zambia;

Zambian Government's notification in national news papers, on 13th June, 2017.

ChackoA@nmc.co.zm