

## **AVIAN INFLUENZA - THE THREAT OF PANDEMIC IS REAL, IF NOT INEVITABLE WHO WILL PROTECT THE SECURITY/ARMED FORCES IN THE CASE OF PANDEMIC?**

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### **Key words:**

Avian influenza, pandemic, bio-terrorism, security/armed forces, education

### **Abstract**

Since 1997 Avian Influenza (AI) infections in poultry have taken on new significance with increasing numbers of cases involving bird-to-human transmission. Do increasing number of human casualties who died due to confirmed infection with H5N1 HPAI viruses impose the suspicion that the potential re-assortment of AI virus genes and the emergence of the new pandemic AI virus generations in humans have already began? Is there some withdrawn “minority report”? We are about to face the serious emergency to which no definitive remedy has been offered yet. The next pandemic could put in questions the entire global security system not to mention the mass casualties, chaos, and political, economic, and cultural integrity, while simultaneously producing high psychological impact and government instabilities. AI has also shed light on a very different danger: that of bio-terrorism and organized crime.

By critical discussion regarding different possible ways to become infected with HPAI viruses, we can't ignore the view that immune system of the human population is hypothetically completely incompetent; nevertheless, the members of Security/Armed Forces we count on substantially in the case of pandemic are human beings.

The established Military educational programs were carefully analysed and we believe that existing ones regarding biological agents and possible biological warfare should be upgraded. There is undoubtedly no advantage in putting too much emphasis on the possibility of accidental/intentional introduction of the communicable diseases, nor from highlighting vulnerabilities. Although, there is a need if not necessity for authorities to do more to educate the Military and Police Forces through extra-specialized programs at the university as well as at the postgraduate level regarding CBRN- defence. Such educational policy is immensely important for Security/Armed Forces to be fully capable to predict and to protect themselves prior to course of action. Track telling are infections diseases being reason for 65-80 % of soldier's hospitalisation in recent wars and military conflicts. Finally, there are also direct international benefits if the government is providing accurate education and timely respond to the threat that AI and other biological agents posed to the global community.

## Introduction

### 1.1 Avian Influenza

By now, the threat of Avian Influenza (AI) has partially receded from the headlines. But the danger posed by the disease remains very real and experts agree that if human-to-human transitions occur, millions of people will die and global economy could dip into recession. It is well known that occasionally devastating pandemic occur in human. Relevant literature data reports that in 20<sup>th</sup> Century the sudden emergence of antigenically different strains transmissible in humans, termed antigenic shift, has occurred on four occasions, 1918 (H1N1), 1957 (H2N2), 1968 (H3N2) and 1976 (H1N1), each time resulting in a pandemic (1). Since first outbreak in Hong Kong in 1997, AI infections, so called “Bird Flu”, in poultry have taken on new significance with increasing number of cases involving bird-to-human transmission and the resulting clinically severe and fatal human infections. The presence of endemic infections by H5N1 (highly-pathogenic-HP) viruses in poultry in several countries indicates that these viruses will continue to contaminate the environment and will be an exposure risk with human transmission and infection. However, the subsequent risk for generating pandemic human strain is still unknown (2). In the light of reasonable threat and the fact that the World Health Organization (WHO) pronounced that world is now closer to another Influenza pandemic than at any time since 1968 pandemic (3), it must be remembered that the true Influenza pandemics are unmistakable and may have catastrophic consequences. Pandemics are the reality of time; the Influenza virus has segmented genome, which undergoes continuous mutations and genetic re-assortments. Minor point mutation causing smaller changes (antigenic drifts) enable viruses to evade immune recognition resulting in repeated Influenza outbreaks during Inter-pandemic years. These pandemics are caused by the most common subtypes of circulating viruses, in the community at that time. Currently, circulating avian subtype H5N1 has high fatality rate and has spread to poultry animals in number of countries. Any virus can cause pandemic if, (a) it has an ability to infect human beings, (b) there is a vulnerable population without innate immunity and, (c) rapid efficient person-to-person transmission occurs. H5N1 has fulfilled the first two criteria and, any genetic change in H5N1 enabling human-to-human transmission will lead to the pandemic of Human Influenza. Human Influenza occurs all over the world with annual global attack rate of 5 – 15% in adults and 20 – 30% in children. It is a self-limiting illness, lasting about a week, characterized by mainly upper respiratory tract illness with symptoms like fever, myalgia and headache. In chronically ill people infection sometimes causes death. Global burden of Inter-pandemic Influenza is estimated around one billion episodes with 3,000,000 – 5,000,000 death annually (3). In the mean time the AI has reached the cross-species transmission and there is a reasonable threat of sudden synergy of AI with seasonal Inter-pandemic Influenza. For the human population as whole the main danger of direct infection with AI appears to be if people infected with an ‘avian virus’ are infected simultaneously with ‘human influenza virus’. In such circumstances re-assortment could occur with the potential emergence of a virus fully capable of spread in the human population. Presumably this represents a very rare coincidence, but one which could result in a true Influenza pandemic (1).

The complete eradication of the disease is absolutely impossible because the natural reservoirs (aquatic birds and shorebirds, originally found in ducks) of the AI viruses are constantly present. In the case of illness in wild birds especially in wild ducks the mild clinical course is mostly expected, although fatal outcome is not a rarity. In opposite almost 100 % mortality in 24 hours after infection with AI viruses is expected in domestic and commercial poultry (1,2,4). In between the AI exceeded the national boundaries and became a trans-national and global threat where natural reservoirs are no longer the major problem. Thousands of people must have been directly exposed to poultry infected with the Asian H5N1 viruses, relatively few become clinically ill and died (1). Do recent human casualties where all the members of the families died due to confirmed infection with H5N1 HPAI viruses pose the very new and threat-full suspicion that the potential re-assortment of AI virus

genes and the emergence of the new pandemic AI virus generations in humans has already began? Is there some withdrawn “minority report”?

We are facing serious threat to which no effective remedy has been offered yet. Symptoms of infection are: increased body temperature, cough, laryngeal pain and breathing difficulties. The incubation period takes 7 - 10 days. The manifestation of mentioned clinical signs and symptoms in this period of time requires immediate clinical intervention. In many patients obvious clinical symptoms of AI are detectable after much shorter incubation period (1 - 3 days) (4,5). Mild form has various time of duration where body temperature decreases in a week, and cough in several weeks. The fatal form of AI results mainly in pneumonia characterized by fatal outcome in a few hours (4,5).

The active members of Security/Armed Forces we count on substantially in the case of future pandemic are human beings. Possible future pandemic could completely paralyse the global society. Such incidence could put in question the entire global intelligence and security system not to mention the mass casualties, chaos, and political, economic and cultural integrity. The human resources could be seriously reduced and we can't exclude the potential losses in the Security/Armed Forces as well.

Nevertheless, the health of livestock today is probably the best it has ever been, so as we learn to better manage that health, we must not lose our skills in managing disease in a world where mistakes are ever more costly (6). Therefore, it is of great importance for government services to evolve the potential nature of the threat and vulnerabilities associated with biological disasters with animal origin and demonstrate its capacity to manage this type of “normal” (accidental) event (7). When developing and performing the successful defence strategies in “normal” (accidental) outbreak of the disease, public will have increased confidence that they will also be able to handle the “abnormal” (intentional) event.

## Theory

### 2.1 Avian Influenza: a boon for terrorists and organized crime?

At the 28<sup>th</sup> World Veterinary Congress in 2006 eloquent fears and warnings has been expressed regarding the intentional introduction of biological agents (5). It is no longer a puzzle that AI represents a substantial fear regarding the intentional introduction by bio-terrorists. Using the available scientific facts about the disease and simultaneously conducting the virtual scenario of possible biological warfare, it is very obvious that AI has ambiguous character. Meaning, there is a thin line between accidental and possible intentional introduction of the disease among commercial poultry and human population.

We believe that AI has some intimidating properties which disaster/emergency management should take into a serious consideration. Since 1997, the fatal disease has “silently” exceeded the national boundaries and became a global threat. We presume that devastating consequences caused by potentially pandemic AI are comparable to those caused by the phenomenon of terrorism. Though, even if we fortunately manage to avoid a human pandemic in 2007, the lack of coordination in response to this global threat should be the reason for serious concern. Without good government planning and proper oversight pandemic disease like AI could become a boon for terrorists and organized crime syndicates alike. In fact, the upsurge in organized crime experienced by Southeast Europe last year was directly attributable mostly to the region's failure to a coordinated policy for Tamiflu. Many people considered the drug as a remedy so demand has increased exponentially as soon as the AI scare engulfed Europe. But the availability of the drug and its price, remained unregulated on the pan-European level. And with high demand low and uncontrolled supply, the opportunity to make extra cash by smuggling the drug across borders was soon seized upon by trans-Balkan criminal networks. The outcomes were predictable; available on the Belgrade market

for 45 Euro apiece, the drug came to be sold in Italy and other EU members for over 100 Euro per unit. The AI has also turned out to be a boon to the counterfeiting business. With demand for Tamiflu outpacing production, counterfeits-called “Tamiflu candies”- have flooded regional markets. This is much more than just a criminal nuisance; it is also a serious impediment to governmental response at the pan-European level. As countries begin to formulate defences against the AI, they will be forced to grapple with counterfeit “medicine” sold at cut-price and, worse still, with false sense of security among those who have already purchased what they believe to be the cure.

In order to weed out the organized crime and terrorism from this field, governments should make some changes to their approach. First, people need to be better acquainted with the Tamiflu drug, particularly with the fact that it may not be one-stop remedy. Second, there is a need to better regulate the drug’s availability and pricing. As long as the alert for AI remains high, each government should coordinate to keep price of Tamiflu and other remedial drugs more or less the same. By eliminating price differences between national markets of close proximity and having strategic stockpiling control over Tamiflu, it is possible to decrease the incentives for criminal and terrorists group to trade Tamiflu on the back market. Third, this could be the right moment to consider making a generic version of Tamiflu. This might be a move that would knock down the price of the drug and make it widely available, particularly in regions classified as high risk.

Not least, there is a high need to better guard against terrorists using the type A virus against commercial targets. Because AI is typically found in birds, commercial poultry is particularly vulnerable. Poultry consumption has already dropped drastically and this is just a foretaste of what is to come if terrorists exploit this makeshift bio-weapon.

There is another critical point governments should be aware of. Changes in trade and travel mean that unless a new model is developed for disease prevention, there is a real possibility that trans-boundary animal diseases, including AI, will become increasingly difficult to control. The traditional government approach of dealing almost exclusively with the commercial sector of the livestock industry is no longer sufficient (8). All groups (stakeholders), including “Grey husbandry” must be involved in decision-making and disease control. Namely, the “Grey husbandry” possesses the involvements with animals that could range from the legal to the unsanctioned and/or illegal. The importance of these “grey areas” increased in recent outbreak of AI among commercial poultry in the United Kingdom (UK) and Hungary. Synopsis of main recommendation intended for use in the UK and elsewhere in the event that the WHO declares that AI pandemic has started (9) are highly precise and “living documents”. Without mutual transparency in reporting of cases and high-level global political leadership we can loose control over disease we currently believe that we actually have.

Moreover, there is another dilemma; are we actually competent to control the possible pathways of the disease regarding daily international migration from/to those regions classified as high risk? Who can predict possible number of the infected passengers without any clinical signs of the disease (incubation period)? Who can predict and prevent such incidence and recommend quarantine regime without violating the human rights of potentially infected persons within the incubation period although human-to-human transmission remains question mark? There are so many additional issues i.e. *In Vivo re-assortment experiments (reverse genetics etc.)*, we have to think about and the only certainty is that there are no certainties, and time is running out.

Finally, even if science fails there are reasonable chances that we can control the spread of AI if there is a strategy in place that allows us increased surveillance over civilian air travel, livestock trade, and gives us the means to better protect key economic sector from terrorists attack.

## 2.2 Avian Influenza: awareness and education

The recent literature data reveal that the scientific expertise among terror groups is very variable, although some members have backgrounds in medicine, microbiology, chemistry up to and including the PhD level. A high degree of education in terror groups aligned with Global Salafi Jihad movement led by Al-Qaeda is perceived. Namely, over 60% of membership had at least some university education (7). Furthermore, what terrorists can't obtain by formal and traditional educational programs can too often be obtained through online educational services or through national and international conferences! It is obvious that we are facing well educated "holly warriors". Do we possess well- educated "cavalry" to fight against?

The importance of survivability and Force Protection (FP) is an essential operating capability. It is a fundamental military principle that all military units must be able to protect themselves. FP is, therefore, a basic duty of all NATO military personnel (10). Joint operation requires an attitude of mind, a culture, by which servicemen and women at all levels are encouraged to develop a sense of interdependence, mutual respect and trust. This is enhanced through increased knowledge and appreciation of each service's capabilities, requirements and sensitivities (11). In order to accomplish such course of action, we believe that knowledge alone is not good enough, though; the knowledge is a starting point from which the education processes begin. The combination of a lot of knowledge and a lot of one-sidedness has proved to tend to be very dangerous. Interdisciplinary and intra-disciplinary cooperation is necessity in order to avoid simplification and changing the values tend to be definitive and of significant or even vital importance.

Chemical, Biological, Radiological and Nuclear defence (CBRN) is advanced guard for ultimate FP. Throughout history; infections diseases contracted naturally have had a significant impact on military operations. The intentional dissemination of disease adds a new dimension to threats that are posed by infectious and toxic agents traditionally transmitted only by natural routes. Biological weapons (BW) are unique in their potential ability to inflict large number of casualties over a wide area with minimal logistical requirements and by means that can be virtually untraceable (12). The global community remains highly vulnerable to the strategic, tactical, and terrorist use of BW. BW is priority call because the full impact of BW attack may take days or weeks to develop. We can only presume how vulnerable stationed and especially deployed Security/Armed Forces actually are. AI and other biological agents can proclaim biological warfare as an inevitable, unavoidable pending catastrophe. In the light of such philosophy, the established Military educational programs were carefully analysed and we strongly believe that existing education regarding biological agents and possible biological warfare should be upgraded. We are talking about special knowledge and specialized educational programs that could provide better introduction and understanding of the threat posed by AI (and other biological agents) to each member of the Security/Armed Forces including Police Forces where no such established educational program can be found. There is a strong need for advanced education among Security/Armed Forces in order to increase and to maintain their operational capability in the case of pandemic and other biological disaster of animal origin.

## Discussion

For now the AI receded from the headlines. But pandemics are the reality of time. The vast majority of the problem remains the fast spreading of the disease among commercial poultry world wide and increasing number of human casualties along with notoriety of the virus for highly frequent genetic re-assortment, which might empower H5N1 to initiate the next human pandemic. The human Influenza caused by H5N1 subtype of the virus has high case fatality of 54 % (3). AI already daily affects pre- and post-harvests both carrying the risk of economic devastation and thus social and political repercussions locally, regionally, nationally and trans-nationally. This could be expected due to globalisation and vertical integration of many industries where any direct interruption in just one part will have immediate impacts on many others. After all, by holistic observation of possible next human pandemic we can't ignore the nowadays nearly catastrophic climate changes tend to bring more and more uncertainties. It is well known that the devastating circle of the different communicable diseases usually finds its closure in the natural disasters. Dangerous communicable diseases (including AI) are frequent or may even become the inevitable side effects of the havocs. In addition the recent literature data report: "During recent wars and military conflicts soldiers were hospitalized because of:

- Battle injuries: 5 - 25 %
- Non-battle injuries: 5 – 10 %
- Infectious diseases: 65 – 80 %" (13).

Once again, the members of the Security/Armed forces we count on substantially in the case of pandemic are human beings. So our topic question: "Who will protect the Security/Armed Forces in the case of pandemic?" is no longer groundless concern. There is undoubtedly no advantage in putting too much emphasis on the possibility of accidental/intentional introduction of the communicable diseases (i.e. AI), nor from highlighting vulnerabilities. However, in our experience the possible weak point of Security/Armed Force is its limitation in a certain level of educational process. Careful revision of the established Military educational programmes regarding CBRN/E- defence calls for an immediate superstructure. Indeed, where is the synergy between the threat of the next human pandemic or other biological disasters and the Military educational programmes? The answer is importance of survivability. In order to carry out this essential duty, we have to start with definition of knowledge-based Security/Armed Forces. Such definition is eloquently supported by NATO Standards for Proficiency for CBRN- defence (14) and The Strategic Vision: The Military Challenge by NATO's Strategic Commanders, which both requires a highly educated and trained Force as essential to operate in complex environments (15). The targeted education regarding CBRN- defence is crucial in order to possess the national Security/Armed forces as a "cavalry" in the situation of crisis (pandemic).

There is a strong need if not necessity for authorities to do much more to educate the Military and Police Forces through extra specialized programs at the university as well as at the postgraduate level regarding CBRN-defence. Such educational policy is immensely important for Security/Armed Forces to be fully capable to predict and to protect themselves prior to course of action, where affected, terrified, and panicked civilian population needs the ultimate protection. We competently presume that advanced specialized education is the most reliable sentinel and counterterrorism tool for Security/Armed Forces in order to maintain its capability and be able to accomplish its mission in the case of pandemic or/and other disasters. Lack of knowledge and negligence to educational impact is the highest jeopardy to establish and especially to maintain the sustainable Force protection. There are also direct international benefits if the government is providing accurate education and timely respond to the threat that AI and other biological agents posed to the global community.

To summarize our approach to possible AI pandemic by highlighting Military education, we would rather delegate this sensitive and delicate issue to the highest authorities in covering field's i.e. civilian universities, to present this dilemma to wider audience in a brighter way.

Can we possibly imagine what pictures of us our opponents on political and religious filed actually do have? Shall they continue their education while we are still discussing about....

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### **Biography**

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