

## **INFORMATION NOTE**

### **Review of avian influenza risk in Hong Kong and latest development on avian influenza vaccines for local chicken farms**

#### **1. Introduction**

1.1 Avian influenza is caused by influenza viruses that mainly affect birds and poultry. People may be infected with avian influenza viruses (mainly influenza A H5N1 and H9N2 viruses) through close contact with live or dead infected birds and poultry or their droppings. Among the different groups of avian influenza viruses, H5N1 is of particular concern because it has a recognized ability to pass directly from birds to humans and once in humans, the virus may cause severe disease with high mortality. Nonetheless, human-to-human transmission of the avian influenza viruses is inefficient.

1.2 In Hong Kong, the first human infection of avian influenza occurred in 1997 when the H5N1 virus infected 18 persons, resulting in six deaths. There was also an outbreak of H5N1 virus in chicken farms and the Cheung Sha Wan Temporary Wholesale Poultry Market in that year. Since then, four more imported cases of human infection of H5N1 avian influenza virus had been detected, of which one infected person died. The latest case was detected in June 2012.<sup>1</sup> The infected person was a two-year-old boy who developed influenza symptoms in Guangdong Province and was tested positive for Influenza A (H5N1) after he returned to Hong Kong.

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<sup>1</sup> Two other cases were detected in 2003 and one other case was detected in 2010.

1.3 The outbreak of avian influenza in 1997 set the stage for the Government to introduce a series of control and preventive measures to minimize the risk of recurrence of the virus. Subsequent to further outbreaks of poultry infection of avian influenza, including the outbreaks in 2001, 2002 and 2008<sup>2</sup>, the Government has tightened up the surveillance and control measures for chicken farms, wholesale and retail markets. According to the Government, it will continue its efforts in controlling the risk of avian influenza outbreaks, and regularly review the risk of avian influenza to Hong Kong with a view to ensuring that its policies are formulated in light of prevailing circumstances.

1.4 The Government will brief the Panel on Food Safety and Environment Hygiene on the review of avian influenza risk in Hong Kong and the latest development on avian influenza vaccines for local chicken farms at its meeting on 12 June 2012. This information note aims to provide information on the control and preventive measures taken by the Government to minimize the risk of avian influenza outbreaks, the vaccination programme for the control of avian influenza in local chicken farms, and previous deliberations related to the issues at the Legislative Council.

## **2. Avian influenza risk in Hong Kong**

2.1 The Government has been adopting a series of preventive and surveillance measures at different levels of the live poultry trade to reduce the risk of avian influenza outbreaks in Hong Kong since 1997. These measures include:

- (a) implementing a surveillance programme for local and imported poultry, wild birds, captive wild birds in recreational parks and pet birds in the market;
- (b) requiring all local chicken farms to vaccinate their chickens since June 2003 and all chickens imported from the Mainland to be vaccinated since January 2004;

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<sup>2</sup> In May 2001, there was an outbreak of avian influenza in ten retail markets. This was followed by another outbreak of avian influenza in two chicken farms in Kam Tin area in February 2002. In December 2008, there was an outbreak of avian influenza in one chicken farm in Yuen Long.

- (c) requiring all local chicken farms to adopt stringent biosecurity measures;
- (d) implementing import control by requiring all imported chickens from the Mainland to come from registered farms and accompanied by health certificates issued by the inspection and quarantine authorities in the Mainland, and conducting inspection on the imported chickens;
- (e) imposing stringent hygiene requirements on wholesale and retail markets;
- (f) banning overnight stocking of live poultry at retail outlets since July 2008; and
- (g) banning the rearing of backyard poultry since February 2006.

2.2 To further reduce the likelihood of human contact with live poultry so as to minimize the risk of human infection of avian influenza, the Government introduced a voluntary surrender scheme and a buyout scheme for poultry retailers, wholesalers, transporters and farmers in 2004 and 2008 respectively. As a result, the number of retail outlets has been reduced from over 800 prior to the introduction of the first voluntary surrender scheme to 132 at present. The corresponding figures for poultry farms were 192 and 30. The total licensed rearing capacity of poultry farms in Hong Kong has also been reduced from 3.9 million in 2004 to about 1.3 million at present. The supply of live chickens in Hong Kong, including those imported from the Mainland<sup>3</sup>, declined from a daily average of 92 000 chickens in 2003 to some 16 500 in 2012.

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<sup>3</sup> About 7 000 live chickens are imported from the Mainland per day at present.

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Further control and preventive measures proposed or undertaken against avian influenza outbreaks

2.3 The Government had considered developing a poultry slaughtering centre in 2004 to reduce the risk of human infection of avian influenza in the long-term. In June 2010, the Government announced that it would shelve the development of a poultry slaughtering centre. The decision was based on the scientific assessment that the prevailing risk of avian influenza in Hong Kong was very low as a result of the implementation of the biosecurity measures and preventive and control measures against avian influenza at different levels of the live poultry trade over the years. Besides, a commercial viability study conducted by the Government concluded that it was not commercially viable to run a poultry slaughtering centre in Hong Kong.

2.4 In view of the potential transmission of highly pathogenic avian influenza viruses from other regions to Hong Kong via migratory birds, the Government has put in place restrictions on public access to the Mai Po Nature Reserve, the outdoor section of the Hong Kong Wetland Park and other walk-in aviaries managed or owned by the Government. These areas will be closed for a period of 21 days if three or more live or dead birds confirmed with highly pathogenic avian influenza virus infection are found within a period of 10 days within a three-kilometer radius of the areas<sup>4</sup>.

2.5 The Government has also developed the Preparedness Plan for Influenza Pandemic to enhance government and community preparedness to cope with avian or pandemic influenza emergencies in 2005. The underlying principle of the Plan is to safeguard the health of the community by reducing risk of human infections, early detection of pandemic influenza, and enhancing emergency preparedness and response for influenza pandemic.

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<sup>4</sup> The restrictions have been implemented since 2006. The condition for closure of the facilities under the restrictions has been slightly relaxed after a review in 2010. The previous condition was that the areas concerned would be closed for a period of 21 days when a dead bird collected within a three-kilometer radius of the areas has been tested positive for highly pathogenic avian influenza virus.

2.6 Under the Plan, the Government has developed a response system that prescribes the key public health actions required under each of the three response levels, namely alert, serious and emergency. These levels are based on different risk-graded epidemiological scenarios relevant to Hong Kong. The response system also provides a clear command and control structure in the Government for response to influenza pandemic.

### **3. Vaccination programme for the control of avian influenza in local chicken farms**

3.1 The Government introduced a vaccination programme on a trial basis in 22 chicken farms in April 2002 to assess the potential role of vaccination for the control of H5N1 avian influenza virus in Hong Kong. In the trial programme, the Government adopted the Intervet Nobilis H5N2 vaccine ("Intervet vaccine"), which was a commercially available vaccine containing an inactivated H5N2 virus. The trial programme was extended by including 53 additional farms in the programme in December 2002. Apart from testing on vaccinated chickens in field conditions, laboratory challenge studies on the vaccine were conducted and the testing results of three infected local chicken farms in January 2003 were analyzed<sup>5</sup>.

3.2 Based on the results of the trial programme and related studies, the Government considered that the Intervet vaccine used was suitable for vaccination for chickens as an additional protective measure for avian influenza in Hong Kong. The Government introduced the mandatory avian influenza vaccination programme for chickens in local farms in June 2003 using the Intervet vaccine<sup>6</sup>. Since then, there has been one reported outbreak of avian influenza on a local chicken farm in Yuen Long in December 2008.

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<sup>5</sup> In these farms, chickens in the affected sheds were culled whereas those in the adjacent sheds were vaccinated to contain the spread of the virus.

<sup>6</sup> All farmers are required to keep 60 chickens without avian influenza vaccination (known as sentinel chickens) with each batch of chickens reared (ranging from 2 000 to 5 000 chickens in each batch) to enable early detection of any avian influenza virus introduced into the farm.

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### Recent development in vaccination programme

3.3 Following the outbreak of avian influenza in a local chicken farm in December 2008, the Government set up the Investigation Group on Vaccine Study ("IGVS")<sup>7</sup> to conduct research and tests on the efficacy of the existing Intervet vaccine used in Hong Kong and studying the effectiveness and quality of alternative vaccines.

3.4 With the endorsement of IGVS, the Agriculture, Fisheries and Conservation Department ("AFCD") engaged three research institutions<sup>8</sup> to conduct vaccine challenge studies to examine and compare the efficacy of three avian influenza vaccines against representative clades of H5N1 viruses detected in Hong Kong. The three vaccines studied were the Intervet vaccine currently in use on all chickens in local farms since 2003, the Harbin Re-5 H5N1 vaccine ("Re-5 vaccine") in use on chickens reared in the Mainland for export to Hong Kong since 2008<sup>9</sup>, and a H5N3 vaccine used in the European Union since 2006. The studies showed that the existing Intervet vaccine was still largely effective in protecting local chickens from the H5N1 virus. This notwithstanding, the studies also showed that the Re-5 vaccine provided similar or even better protection as compared with the Intervet vaccine.

3.5 IGVS considers that before making a conclusive recommendation on the introduction of the Re-5 vaccine to vaccinate chickens on local chicken farms, there is a need to conduct field trials in local farms in order to comprehensively evaluate its efficacy and to observe whether it would have any adverse effect on chickens under local conditions. In early November 2010, AFCD commenced a 12-month voluntary field trial programme in two local chicken farms using the Re-5 vaccine<sup>10</sup>. IGVS would make a recommendation on the proper choice of vaccine to be used in local chicken farms based on the results of the field trial.

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<sup>7</sup> The convener of IGVS is the Director of Agriculture, Fisheries and Conservation, and members include experts from the University of Hong Kong, the Ministry of Agriculture of the Mainland, representatives of AFCD and the Department of Health.

<sup>8</sup> The three research institutions were the Harbin Veterinary Research Institute, the Department of Microbiology of the University of Hong Kong, and the Veterinary Laboratories Agency under the Department for Environment, Food and Rural Affairs of the United Kingdom.

<sup>9</sup> According to the Government, no highly pathogenic avian influenza has been detected in the imported chickens from the Mainland since the use of Re-5 vaccine in 2008.

<sup>10</sup> During the trial period, four to five batches of chickens in the participating farms would be vaccinated with the Intervet vaccine while an equivalent number of batches of chickens would be vaccinated with the Re-5 vaccine.

#### **4. Deliberations at the Legislative Council**

4.1 Issues related to avian influenza have been discussed by Members in the Council and at various committees since 1997, including Council meetings, the Panel on Food Safety and Environmental Hygiene, and joint meetings of the Panel on Food Safety and Environmental Hygiene and the Panel on Health Services. The recent discussions on the issue are summarized in the paragraphs below.

##### Control and preventive measures to minimize the risk of avian influenza outbreaks

4.2 Members discussed the epidemiology report on the outbreak of H5N1 avian influenza virus in a chicken farm in Yuen Long at the meeting of the Panel on Food Safety and Environmental Hygiene on 10 March 2009. There was a view that the Administration had failed to do a good job in monitoring local chicken farms as the epidemiology report revealed some biosecurity vulnerabilities and breaches on the chicken farm concerned.

4.3 The Administration responded that while no biosecurity measures could be completely foolproof against the introduction of the avian influenza virus whether in Hong Kong or elsewhere, reasonably practicable biosecurity measures should be adopted for containing the risks of the introduction or spread of the avian influenza virus. The Administration disagreed with the view that it had not been doing a good job in monitoring local chicken farms as evidenced by no reports on the avian influenza outbreak at local chicken farms since 2003, except for the outbreak in a chicken farm in Yuen Long in December 2008.

4.4 At the meeting of the Panel on Food Safety and Environmental Hygiene on 9 November 2010, members questioned about the risk of human infection by highly pathogenic avian influenza viruses through contact with wild birds in Hong Kong. The Administration replied that results from wild bird surveillance<sup>11</sup> showed that out of the dead wild birds collected in the territory and tested for highly pathogenic avian influenza from 2006 to September 2010, only 50 were tested positive. Of the 205 cases of human infection of avian influenza reported worldwide between 2007 and 2009, only two cases were known to be associated with contact with wild birds.

#### Supply of live poultry

4.5 Members have urged the Administration to review the easing of the control on the supply of live poultry, including imported and locally reared live poultry, on several occasions in the past two years in view of the lowering of the risk of avian influenza outbreak in Hong Kong. In response to a Member's question about the issue at the Council meeting of 30 June 2010, the Administration responded that the success in reducing the risk of avian influenza in Hong Kong to a low level was the result of the implementation of various preventive and control measures at the farm, wholesale, retail and import levels over the past years. The Administration stated that it needed to maintain vigilance against avian influenza as the risk level might change and it should maintain and reinforce the existing control measures relating to the live poultry trade.

4.6 At the special meeting of the Panel on Food Safety and Environmental Hygiene on 20 October 2011 when the Administration briefed members on the policy initiatives for 2011-2012, the Administration stated that the risk of avian influenza was low in local public markets under the policy of limiting the supply of live poultry and banning the overnight stocking of live poultry at the retail level. However, the regional and global risk of avian influenza outbreak had not been lowered. The Administration would maintain the current measures to ensure food safety as well as providing business opportunities for local chicken farmers.

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<sup>11</sup> The Government has covered wild birds, captive wild birds in recreational parks and pet birds in retail bird markets under its avian influenza surveillance programme since the end of 2002. It has also provided a sick and dead wild bird collection service to the public since October 2005.

### Field trial programme using the Harbin Re-5 H5N1 vaccine

4.7 At the meeting of the Panel on Food Safety and Environmental Hygiene on 11 January 2011, the Administration briefed members on the field trial programme using the Re-5 vaccine in local chicken farms. Some members considered that the Administration could adopt the Re-5 vaccine for vaccinating chickens reared in local farms as early as possible given that the vaccine had been used in all chickens imported from the Mainland and its efficacy had been proven.

4.8 The Administration responded that although the Re-5 vaccine was the main vaccine used on chickens reared in the Mainland for export to Hong Kong, it had not been tested on chickens raised under local farm conditions. The Administration considered that there was a genuine need to conduct field trial in local farms in order to (a) observe whether the switch from the Intervet vaccine to the Re-5 vaccine would have any adverse effect on chickens under local farm conditions, and (b) comprehensively evaluate the efficacy of the Re-5 vaccine against highly pathogenic avian influenza viruses.

4.9 The Administration further explained that the field trial had already been launched for about two months. A member then sought information on the preliminary findings of the field trial. The Administration replied that since the launch of the field trial in early November 2010, the vaccinated chickens had not responded adversely to the Re-5 vaccine. The Intervet vaccine and the Re-5 vaccine had comparable efficacy. Tests for the H5 viruses in both environmental samples and cloacal swabs collected from chickens had been conducted and had yielded negative results so far. There was also a member questioning about the cost of the Re-5 vaccine, the Administration replied that the average cost per dosage of the Re-5 vaccine was less than HK\$1, which was roughly half of that of the Intervet vaccine.

4.10 At the meeting, some members were also concerned about the risk of an avian influenza outbreak during the trial period and the impact on the livelihood of nearby chicken farmers in case of an avian influenza outbreak in the participating farms as the Administration would, in accordance with the existing arrangement, cull all the chickens in the farm concerned and the nearby farms. They enquired about the measures to be taken in case of avian influenza outbreaks in the participating farms. The Administration responded that should there be any irregularities in any of the participating farms during the trial period, it would take actions in accordance with the established preparedness plan. The Administration would monitor closely the situation of the vaccinated chickens and stayed vigilant against avian influenza throughout the trial period.

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Prepared by Ivy CHENG  
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Tel: 3919 3636

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## References

1. Agriculture, Fisheries and Conservation Department. (2012a) *Fresh Food Supply & Consumption*. Available from: [http://www.afcd.gov.hk/english/agriculture/agr\\_fresh/agr\\_fresh.html#1](http://www.afcd.gov.hk/english/agriculture/agr_fresh/agr_fresh.html#1) [Accessed June 2012].
2. Agriculture, Fisheries and Conservation Department. (2012b) *Newsletters – Disease reports*. Available from: [http://www.afcd.gov.hk/english/quarantine/qua\\_vetlab/qua\\_vetlab\\_nldr/qua\\_vetlab\\_nldr.html](http://www.afcd.gov.hk/english/quarantine/qua_vetlab/qua_vetlab_nldr/qua_vetlab_nldr.html) [Accessed June 2012].
3. Agriculture, Fisheries and Conservation Department and Health, Welfare and Food Bureau. (2003) *Vaccination for the Control of H5N1 Avian Influenza in Hong Kong*. Paper submitted to the Panel on Food Safety and Environmental Hygiene of the Legislative Council for discussion on 27 May 2003. LC Paper No. CB(2)2170/02-03(03).
4. Centre for Health Protection. (2012) *Avian Influenza Report*. Available from: [http://www.chp.gov.hk/en/guideline1\\_year/29/134/441/332.html](http://www.chp.gov.hk/en/guideline1_year/29/134/441/332.html) [Accessed June 2012].
5. *Centre for Health Protection*. (2012) Available from: <http://www.chp.gov.hk/en/index.html> [Accessed June 2012].
6. Food and Health Bureau. (2007a) *Emergency Preparedness for Influenza Pandemic in Hong Kong*. Available from: [http://www.chp.gov.hk/files/pdf/checklist-e\\_flu\\_eng\\_200708.pdf](http://www.chp.gov.hk/files/pdf/checklist-e_flu_eng_200708.pdf) [Accessed June 2012].
7. Food and Health Bureau. (2007b). *Hong Kong's preparedness for influenza pandemic – Prevention and Protection*. Available from: <http://www.info.gov.hk/info/flu/eng/files/hkpihppp.pdf> [Accessed June 2012].
8. Food and Health Bureau. (2009a) *Policy Initiatives of Food and Health Bureau for 2010*. Paper submitted to the Panel on Food Safety and Environmental Hygiene of the Legislative Council for discussion on 16 October 2009. LC Paper No. CB(2)41/09-10(01).

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9. Food and Health Bureau. (2009b) *Preventive Measures against Avian Influenza*. Paper submitted to the Panel on Food Safety and Environmental Hygiene of the Legislative Council for discussion on 10 March 2009. LC Paper No. CB(2)1015/08-09(03).
  10. Food and Health Bureau. (2010a) *Motion on "Reviewing the existing policy on live poultry in Hong Kong" at the Legislative Council meeting on 12 May 2010 – Progress Report*. Available from: <http://www.legco.gov.hk/yr09-10/english/counmtg/motion/cm0512-m1-prpt-e.pdf> [Accessed June 2012].
  11. Food and Health Bureau. (2010b) *The 2010-11 Policy Address – Policy Initiatives of Food and Health Bureau for 2010-11*. Paper submitted to the Panel on Food Safety and Environmental Hygiene of the Legislative Council for discussion on 15 October 2010. LC Paper No. CB(2)50/10-11(01).
  12. Food and Health Bureau. (2011) *The 2011-12 Policy Address – Policy Initiatives of Food and Health Bureau for 2011-12*. Paper submitted to the Panel on Food Safety and Environmental Hygiene of the Legislative Council for discussion on 20 October 2011. LC Paper No. CB(2)67/11-12(01).
  13. Food and Health Bureau and Agriculture, Fisheries and Conservation Department. (2010) *Review on the Restrictions on Public Access to the Mai Po Nature Reserve, the Hong Kong Wetland Park and other Walk-in Aviaries upon Detection of Highly Pathogenic Avian Influenza Viruses in Wild Birds Collected from these Areas or their Vicinity*. Paper submitted to the Panel on Food Safety and Environmental Hygiene of the Legislative Council for discussion on 9 November 2010. LC Paper No. CB(2)187/10-11(03).
  14. Food and Health Bureau and Agriculture, Fisheries and Conservation Department. (2011) *Field Trial Programme using the Harbin Re-5 H5N1 Avian Influenza Vaccine in Local Chicken Farms*. Paper submitted to the Panel on Food Safety and Environmental Hygiene of the Legislative Council for discussion on 11 January 2011. LC Paper No. CB(2)713/10-11(03).

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15. Legislative Council Secretariat. (2002a) *Background paper on Discussion on the Report of the Investigation Team for the 2002 Avian Influenza Incident*. Paper submitted to the Panel on Food Safety and Environmental Hygiene of the Legislative Council for the meeting on 19 December 2002. LC Paper No. CB(2)699/02-03(05).
  16. Legislative Council Secretariat. (2002b) *Background paper on Measures to control avian flu*. Paper submitted to the Panel on Food Safety and Environmental Hygiene of the Legislative Council for the meeting on 27 May 2002. LC Paper No. CB(2)1973/01-02(06).
  17. Legislative Council Secretariat. (2006) *Background brief on Measures to control avian influenza*. Paper submitted to the Panel on Food Safety and Environmental Hygiene and Panel on Health Services of the Legislative Council for the joint meeting on 12 December 2006. LC Paper No. CB(2)587/06-07(04).
  18. Legislative Council Secretariat. (2009) *Background brief on Measures to control avian influenza*. Paper submitted to the Panel on Food Safety and Environmental Hygiene of the Legislative Council for the meeting on 10 March 2009. LC Paper No. CB(2)1015/08-09(04).
  19. Legislative Council Secretariat. (2011) *Background brief on Vaccination for the Control of Avian Influenza in Hong Kong*. Paper submitted to the Panel on Food Safety and Environmental Hygiene of the Legislative Council for the meeting on 11 January 2011. LC Paper No. CB(2)713/10-11(04).
  20. *Minutes of Meeting of the Panel on Food Safety and Environmental Hygiene of the Legislative Council*. (2003) 27 May. LC Paper No. CB(2)3007/02-03.
  21. *Minutes of Meeting of the Panel on Food Safety and Environmental Hygiene of the Legislative Council*. (2009) 10 March. LC Paper No. CB(2)1264/08-09.
  22. *Minutes of Meeting of the Panel on Food Safety and Environmental Hygiene of the Legislative Council*. (2010) 9 November. LC Paper No. CB(2)491/10-11.

23. *Minutes of Meeting of the Panel on Food Safety and Environmental Hygiene of the Legislative Council*. (2011) 11 January. LC Paper No. CB(2)1163/10-11.
24. *Official Record of Proceedings of the Legislative Council*. (2010) 12 May.
25. The Government of the Hong Kong Special Administrative Region. (2010) *Press Releases: LCQ10 – Supply of live poultry*. 30 June. Available from: <http://www.info.gov.hk/gia/general/201006/30/P201006300155.htm> [Accessed June 2012].
26. The Government of the Hong Kong Special Administrative Region. (2012a) *Prevention of Avian Influenza – Global statistics of avian influenza*. Available from: <http://www.info.gov.hk/info/flu/eng/global.htm> [Accessed June 2012].
27. The Government of the Hong Kong Special Administrative Region. (2012b) *Press Releases: SFH on avian influenza*. Available from: <http://www.info.gov.hk/gia/general/201206/02/P201206020344.htm> [Accessed June 2012].
28. World Health Organization. (2012) *Influenza at the Human-Animal Interface (HAI)*. Available from: [http://www.who.int/influenza/human\\_animal\\_interface/en/](http://www.who.int/influenza/human_animal_interface/en/) [Accessed June 2012].