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United Kingdom procedures for preventing the introduction or spread of Highly Pathogenic Avian Influenza in Antarctica

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Summary

This paper provides information on the procedures that the United Kingdom has put in place to prevent the introduction or spread of Highly Pathogenic Avian Influenza (HPAI) in Antarctica.

Introduction

Since the beginning of 2022, the increasing intensity of highly pathogenic avian influenza (HPAI) H5N1 outbreaks has resulted in the death of hundreds of thousands of seabirds in the Northern Hemisphere, around the Atlantic and Pacific Oceans and southern Africa. There is a heightened risk of HPAI being introduced to Antarctica.

ATCM XLV WP3 *Surveillance and coordination for the prevention and detection of highly pathogenic avian influenza in Antarctica* recommends that the CEP encourages Parties to develop and implement procedures for preventing the introduction or spread of HPAI by their National Antarctic Programs. The United Kingdom takes the opportunity to provide information on procedures implemented during the 2022-2023 season to prevent the introduction or spread of HPAI in Antarctica.

United Kingdom HPAI Response

The United Kingdom's response plan for HPAI (at Annex A) applies to all members of the UK's National Antarctic Programme (British Antarctic Survey). The response plan follows a phased approach, based on a regular risk assessment process that is applied as new evidence arises.

Throughout the 2022-2023 season the United Kingdom also required participants in UK-authorized activities in Antarctica to follow guidelines to prevent the spread of HPAI (Annex B). The guidelines were based on the recommendations in the report *The Risk of Avian Influenza in the Southern Ocean: A practical guide for operators interacting with wildlife*¹. The guidelines required taking steps such as thoroughly removing any soiled material from boots and disinfecting clothing before visiting; assessing whether colonies might potentially be infected with HPAI; aborting visits if there are signs of an unusual/mass mortality event or behavioural signs of HPAI within a colony; and maintaining minimum distances from wildlife at all times. Authorised participants were required to report any signs of HPAI to the UK National Competent Authority.

The United Kingdom will review its procedures and guidelines in advance of the 2023-2024 season to ensure they remain up to date and that they reflect the risk and any new science.

References

¹ Dewar et al. 2022

Dewar, M., Wille, M., Gamble, A., Vanstreels, R., T., Smith, A., Varsani, A., Ratcliffe, N., Black, J., Lynnes, A., Barbosa, A. & Hart, T. (2022) The Risk of Avian Influenza in the Southern Ocean: A practical guide for operators interacting with wildlife

Annex A

British Antarctic Survey

Response to a potential Avian Flu epidemic

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Purpose of the paper

The purpose of this paper is to discuss the risks and contingencies associated to the [Avian Influenza epidemic](#) (AI) seen in the Northern Hemisphere. There are substantial concerns that the epidemic will spread southward (through South America) over the coming months with migrating birds. As a result, there could be scenes of mass mortality in certain bird species in the Antarctic region, as observed already in, for example, UK seabird colonies on the Farne Islands and Bass Rock. The current assessment of the risk of that scenario occurring in Antarctica is 'low'; however, BAS has a duty to respond and prepare to protect both the bird colonies that we study and the personnel who carry out that work.

Current risks identified

Risk to human health

The current risk to human health has been assessed by the UK [Health and Safety Executive](#) as 'very low' (minimal). The risk is increased through conditions such as enclosed poultry farms with high levels of dust and close contact with confirmed infected birds. Cases of the current strain of AI have been recorded in a small number of humans, but all have been asymptomatic. The current consensus from UK Animal and Plant Health Agency (APHA) and the UK HSE is human safety controls only need to be implemented once AI is 'suspected' in a local bird population. Up to that point, close monitoring and awareness of

the potential for AI to arrive is considered an appropriate response. Normal working practices should prevail (Phase 0). Once AI is ‘suspected’ in a bird population, face-fitted masks and other PPE will likely be required when handling birds for science (Phase 1). NOTE: The BAS Health and Safety Team have provided the teams who will be working with birds this season (22/23) with appropriate training, face mask fit testing and supplies of contingency stocks of appropriate PPE and materials.

Risk that BAS could spread AI through its activities	The primary biosecurity risk originates from the transfer of AI-contaminated material (e.g., dead birds, guano, etc.) between major locations of operation. In the BAS operation, transfer of AI is most likely to occur via cargo on board vessels that has been contaminated following exposure to local bird population whilst being stored outside. Lack of data makes the assessment of the effectiveness of currently implemented BAS biosecurity measures difficult to ascertain. However, existing practices, such as cleaning of cargo, vehicles, footwear, etc., will reduce the risk.
Risk to science business continuity	A widespread AI outbreak (Phase 3) is likely to have a major impact on the delivery of existing research projects concerning bird and, potentially, seal populations. The current risk assessment suggests the risk of AI effecting the Antarctic bird populations is potentially low. AI infected birds are likely to have their navigation abilities severely impaired, which may reduce the likelihood of infected birds completing their long-distance migration routes to the South Atlantic region. Nevertheless, sequential shorter movements of infected birds through South America will likely bring AI to the Antarctic region within the next 2 years. BAS science teams are working to prioritise their research activities to facilitate more rapid decision making in the event of a suspected or confirmed AI outbreak.
The worst case scenario	Whilst very unlikely in an Antarctic context, there have been three cases of AI transmission to seals in the Northern Hemisphere. Should AI transmission from birds to marine mammals occur near a BAS research station, the potential risk to humans coming in close contact with the seal population would be a major concern. Advisers from APHA UK suggest that such a scenario would necessitate a reassessment of the safety of personnel remaining on station.
Reputational risk	The issue of AI is being considered by IAATO, the Foreign, Commonwealth & Development Office (FCDO) and many national Antarctic programmes. Owing to BAS’s science activities on highly important bird colonies, it is vital BAS demonstrates an appropriate and competent response and identifies appropriate mitigation measures to minimise the potential threat of spreading AI between bird populations. For this reason, BAS has sought out authoritative advice from the APHA, i.e., the APHA Avian Virology Workgroup Leader and Deputy Director of the International Reference Laboratory for Avian Influenza, Swine Influenza and Newcastle Disease. See Appendix 1.

The BAS Contingency Plan for Avian Influenza (AI)

Phased approach	A phased approach is being applied to the BAS response to AI. It is anticipated that <u>Phase 0</u> will prevail but planned contingencies will be implemented to control further eventualities. The phased approach is based on a regular risk assessment process that will be applied as new evidence arises. Current predictions suggest that BAS will remain in Phase 0 for the foreseeable future. However, the likelihood of AI arriving at our Gateways should be
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considered likely at some stage in the future. Should this occur, then it could be anticipated that suspected AI cases in the vicinity of BAS stations may be imminent.

Phase 0

- No change to current ways of working with bird populations
- Existing biological safety and hygiene practices should be maintained
- Maintain heightened awareness (training) and undertake existing biosecurity checks for cargo transfers and storage
- Monitor reports of AI in South American bird population
- Monitor local bird populations for signs of pathogenicity (in consultation with BAS Cambridge team)

The main focus of Phase 0 will be to monitor progress of cases of AI through South America. The monitoring activity will be led by the BAS AI Risk Review Team using a variety of sources. The monitoring will also include any reported changes in the level of AI virus pathogenicity to humans.

Phase 1

- AI confirmed at Gateways
- Personnel at Gateways instructed to stop visits to local bird colonies
- Review risk assessment for those activities which involve close contact with birds
- Review station practices to reduce the risk of local spread of AI

Should AI be suspected or confirmed at Gateways then the BAS AI Response Team will review the risk assessments for activities associated with birds. The risk to health will continue to be low but heightened safety controls may begin at this point.

Phase 2

- Monitoring shows enhanced levels of bird mortality near stations
- Pause all work requiring physical contact with birds or bird colonies visits for further assessment
- Decision point: either move back to Phase 1, or progress to Phase 3

Phase 2 is intended to be a brief decision phase. Available data shall be reviewed, and expert advice sought. Confirmation (resulting from laboratory analysis of samples) of the presence of AI infected birds in colonies near stations will take some time. Consequently, rapid decision making may be required without the benefit of full information, and therefore a precautionary approach will be required, i.e., either to return to Phase 1 or to escalate the situation to Phase 3.

Phase 3

- AI outbreak in local bird colony strongly indicated or confirmed
- Only risk assessed and approved activities to proceed (both science & stations)
- AI confirmatory samples to be collected for the APHA UK by training personnel only
- Local seal populations to be closely monitored for signs of unusual mortality levels
- Exclusion zones and disinfection areas established for the stations

Should a Phase 3 situation be declared, then the BAS Cambridge AI Risk Review Team shall undertake a risk assessment review and only approve priority science activities involving birds. The risk assessment review will also consider operational and recreational activities that could facilitate exposure to or spread of the virus. At this point, it shall be mandatory that individuals with permission to continue working in close contact with birds shall use fit tested PPE and protective clothing.

To reduce risks to health and virus transmission in the vicinity of the station, heightened biosecurity measures are anticipated involving, for example, clothing and outdoor footwear cleaning routines.

Phase 4

- Suspected evidence of AI within the seal population
- Halt all interactions with seals
- Undertake risk assessment and obtain specialist advice
- BAS Major Incident system initiated to manage response

Phase 4 is intended to be a brief decision phase (similar to Phase 2). AI infection and symptoms in seals, as a result of the virus jumping from birds to mammals, is a cause for concern regarding the health of humans in the local vicinity. BAS should seek advice from relevant experts and stakeholder in order to undertake a risk assessment to ensure personnel are not at risk of contracting AI. In this scenario BAS will use the BAS Major Incident Plan, Bronze, Silver, Gold structure to manage and make appropriate decisions.

Monitoring

BAS AI Risk Review Team

A critical task for BAS is to remain informed of risks associated with AI and the location of outbreaks in the Southern Hemisphere. There will be a BAS AI Risk Review Team who will meet regularly to review the situation and facilitate appropriate decision-making and authority regarding AI in Antarctica. The team will monitor (i) reports of the spread of AI in bird populations in the Southern Hemisphere and (ii) emerging evidence that the virus has changed pathogenically whereby the potential risk to human health is increased. The team will be chaired by the Head of Risk and Assurance. The November meeting of the BAS Management Team will provide confirmation and approval that this team is given the authority to make decisions regarding risk controls for AI through Phases 0, 1, 2 and 3. Should the situation warrant a Phase 4 situation to be declared, then it is expected the BAS Major Incident System will be instigated and BAS Gold team will take over decision making.

Reporting

- A monthly update to the BAS Management Team will be provided by the BAS AI Risk Review Team to ensure any changing risk levels are understood.
- The Station Leaders will be kept abreast of the current status of AI so that any move between phases is anticipated and the context understood. BAS AI Risk Review Team will also require regular reporting and monitoring by Station Leaders and staff for AI-related evidence.

- **Figure 1. Summary of BAS Avian Influenza Phases**

<p style="text-align: center;"><u>Phase 0</u> AI not suspected</p>	<ul style="list-style-type: none"> • No change to current ways of working with bird populations • Existing biological safety and hygiene should be maintained • Maintain heightened awareness (training) and undertake existing biosecurity checks for cargo transfers and storage • Monitor reports of AI in South American bird population (BAS AI Risk Review Team) • Monitor local bird populations for signs of pathogenicity
<p style="text-align: center;"><u>Phase 1</u> AI Risk increased</p>	<ul style="list-style-type: none"> • AI confirmed at Gateways • Personnel at gateways instructed to stop visits to local bird colonies • Review risk assessment for those activities which involve close contact with birds • Review station practices to reduce the risk of local spread of AI
<p style="text-align: center;"><u>Phase 2</u> AI suspected</p>	<ul style="list-style-type: none"> • Monitoring shows enhanced levels of bird mortality near stations • Pause all work requiring physical contact with birds or bird colonies for further assessment • Decision point: either move back to phase 1 or progress to phase 3
<p style="text-align: center;"><u>Phase 3</u> AI likely or confirmed</p>	<ul style="list-style-type: none"> • AI outbreak in local bird colony strongly indicated or confirmed • Only risk assessed and approved activities to proceed (both science/stations) • AI confirmatory samples to be collected for the APHA UK by training personnel only • Local seal population to be closely monitored for signs of unusual mortality levels • Exclusion zones and disinfection areas established for the stations
<p style="text-align: center;"><u>Phase 4</u> AI evident in seal population</p>	<ul style="list-style-type: none"> • Suspected evidence of AI within the seal population • Halt all interactions with seals • Undertake Risk assessment and specialist advice • BAS Major Incident system initiated to manage response

Appendix 1 summary of advice from Animal Plant Health Agency

Avian Influenza update

19 October 2022

Key Points – understanding influenza virus classification and surveillance

- The seasonal highly pathogenic avian influenza (HPAI) virus has two types – Type A and Type B.
- There are eight RNA gene segments that contain the instructions for viral replication
- The virus surface proteins – hemagglutinin (HA) and neuraminidase (NA) – determine important biochemical and infection properties of the virus.
- Genetic variations can alter the proteins, and thereby properties of the virus.
- The Centre for Disease Control undertake ongoing surveillance of both human and animal influenza strains to monitor genetic mutations, including characteristics that

can alter infection risk, severity of symptoms and effectiveness of vaccines and antiviral treatments.

- Surveillance includes the potential for influenza virus in animals to infect humans.
- Human avian flu infections are considered rare.

Risks

1. *Current risk to humans*

- Overall risk to public health from the strain of avian influenza (A(H5N1)) involved in current outbreaks in the UK is considered very low.
- To date, no cases of pathogenicity involving the strain of A(H5N1) currently present in Northern Hemisphere bird populations have been detected in humans.
- Positive cases of the current strain of A(H5N1) in humans are rare (and have only been seen where humans are in close proximity to poultry/water fowl) and were asymptomatic.
- Person to person transfer has not been detected.

2. *Current risk to bird populations*

- The current A(H5N1) strain is highly pathogenic within bird populations.
- Infection is present in migratory pathways, increasing the spread of infection geographically.
- High mortality rates are seen in some species, others appear to recover.
- Water birds are the main source of infection.
- The neurological effects of the virus is likely to impact migratory ability: viral spread to Antarctic via migratory species originating in the Northern Hemisphere in low.
- Some cases have been reported recently in the southern USA. Therefore, there is a strong risk of viral spread to South America.

3. *Current risk to mammals*

- A(H1N1) has been shown to transmit to mammals (seals, foxes, bobcats, rats...)
- It is thought that infection occurs as a result of scavenging and the consumption of infected birds.
- The neurological effects of viral infection include brain inflammation which can alter behaviour, e.g. foxes twitching and walking in circles, bobcats having no fear of humans. Ultimately, viral infection in mammals can result in seizures and death.
- It is not thought likely that the virus can be transferred between individual mammals.

Recommendations from a biological safety perspective

1. *Current situation*

- The current human risk as a result of standard human activity around BAS stations and during interactions with wildlife is considered minimal. Steps should be taken to increase the awareness of BAS personnel to the biological risks and need for good personal hygiene and biosecurity measures.
- BAS should monitor for outbreaks in South America, and if detected, move to the next risk level.

- BAS should monitor available information on the level of risk to human health. The BAS risk level should be increased if the Centre for Disease Control (CDC) or Animal and Plant Health Agency (APHA) advise changes.
 - PPE (including the use of a face mask and eye protection) should be worn where the appropriate activity risk assessment identifies increased biological hazard resulting from aerosols/fluids, such as contact with guano or collecting biological samples.
2. *Steps should there be an Increase in risk of infection resulting from the viral strain reaching bird populations in the wider Antarctic region*
- BAS personnel should increase vigilance for signs of the virus and associated symptoms in local bird populations.
 - Activities should be re-assessed with regard to their risk of biological hazard risk in light of an increase potential for virus to be present the wildlife populations. Decisions to (i) cease activities involving interaction with wildlife, (ii) increase PPE or (iii) modify procedures to reduce risk should be taken as deemed appropriate.
 - Keep 1m distance from birds where possible for work activities.
 - Biosecurity measures shall be increased for travel between Antarctic sites and on each BAS station.
 - BAS personnel shall record and report any suspected infections: date, time, location, description of symptoms and behaviours. A video shall be taken, if possible. (See BAS Animal Mass Animal Mortality Event response plan within the BAS Biosecurity Regulations)
 - BAS shall provide clear instruction not to touch any sick or dead birds.
3. *Suspected outbreak in bird populations in sub-Antarctica/Antarctica*
- All activities involving interaction with wildlife shall be paused and the situation monitored.
 - Instruction not to touch any sick or dead birds shall be reiterated
 - Any suspected new infections shall be reported and recorded. Information reported shall include: date, time, location, description of symptoms and behaviours. A video shall be taken, if possible.
 - Activities should be re-assessed with regard to their risk of biological hazard risk in light of the presence of the virus in local wildlife populations. Decisions to (i) cease activities involving interaction with wildlife, (ii) increase PPE (gloves, face masks, goggles/visor, waterproof outer clothing), or (iii) modify procedures to reduce risk should be taken as deemed appropriate.
 - Staff shall increase vigilance for signs and symptoms in other local bird populations and seal populations.
 - Following full discussion and training by BAS Cambridge personnel, a nominated person is to collect samples for subsequent return to UK for analysis (detailed instructions to be provided).
4. *Suspected outbreak in mammal populations in sub-Antarctica/Antarctica*
- Pause all activities in the vicinity of the suspected outbreak and restrict movement to Station only.
 - Report immediately to the BAS H&S Office.

- Provide details of the suspected outbreak including: Date, time, location, description of symptoms and behaviours. Provide a video, if possible.
- Wait for a response from BAS Cambridge before taking any further action.

Annex B: Guidelines that all UK-authorized activity participants were required to follow during the 2022-23 season

Avian influenza

1. Since the beginning of 2022, the increasing intensity of highly pathogenic avian influenza (HPAI) H5N1 outbreaks has resulted in the death of hundreds of thousands of seabirds in the Northern Hemisphere, around the Atlantic and Pacific Oceans and southern Africa. There is a heightened risk of HPAI being introduced to Antarctica during the 2022/23 Austral summer by migrating seabirds. If you detect signs of HPAI you must report this to the permit authority, which may issue further specific instructions.
2. The below guidelines should be followed to prevent the spread of HPAI.

Before leaving for Antarctica and the sub-Antarctic:

3. All expeditioners/guides working in other wildlife areas (e.g., seabird colonies, the Arctic, Alaska, etc.) should thoroughly remove any soiled material (i.e., soil, faeces) from their boots and disinfect all clothing, footwear and any equipment before leaving for Antarctica and the sub-Antarctic to prevent introduction of HPAI from other wildlife areas. It is recommended to use new clothes, footwear and equipment when possible.
4. All guests should remove all soiled material and disinfect footwear before boarding the vessel, especially if they have been near wildlife colonies.
5. The use of Virkon™ S, F10 or soap followed by 10% bleach is recommended for disinfection of boots and outer clothing.

Before visiting a colony or wildlife aggregation:

6. In general, regional specific advice/regulation may exist, so you should adopt whichever is the more precautionary.

7. To identify if a colony is potentially infected with HPAI, an appropriately trained or experienced guide/research team should be sent out via zodiac and avoid landing if possible (or via high vantage point at remote southern colonies) and observe the colony using binoculars to look for carcasses and behaviour of live birds (further information in guidance - <https://ecoevorxiv.org/8jrbu/>) before entering site/sending tourists/parties to shore. In case of terrestrial approaching, observations using binoculars will be made at a distance of 150 m from the closest animal aggregation.
8. If there are signs of an unusual/mass mortality event or behavioural signs of HPAI within a colony, the visit should be aborted. Equipment and clothing should be disinfected as soon as possible and the observations reported to your permit authority immediately. There may also be other specific reporting forms or procedures, particularly for sub-Antarctic Islands.
9. In general, all equipment (including boots, backpacks, hiking poles, tripods, and cones or route markers, etc.) should be cleaned of any soiled material (i.e., soil, faeces) and disinfected before disembarking the boat/leaving base and every time after visiting a colony.

During a visit:

10. Unless permitted, visitors to wildlife colonies, should always keep a minimum distance of 5 metres from wildlife, in addition to strict adherence to IAATO guidelines/ATCM general guidelines or any other local requirements (https://documents.ats.aq/recatt/att483_e.pdf) given a greater distance may be required for different animal species and age cohorts. If an animal spontaneously approaches an individual or visitors, they should retreat to ensure this minimum distance is rigorously adhered to unless specifically studying or sampling animals.
11. People should refrain from sitting on or lying on bare ground or rocks, or leaving any equipment on bare ground or rocks close to animal activity or faecal matter (within 10 metres of nests, haul-out sites or pathways). Freshwater pools should also be avoided.
12. To minimise animal exposure to equipment/potential fomite transmission (i.e., transmission from objects or equipment carrying infection), field equipment should not be left unattended and should be kept far from wildlife.
13. Visitors should adhere to strict recommendations for personal hygiene at all times (frequent hand washing for the appropriate time and regular disinfection).
14. Never touch birds, dead or alive unless you have a permit that in this case specifically includes birds with suspected disease.

Post visit:

15. All equipment (including boots, tripods, etc.) should be also cleaned of any soiled material (i.e., soil, faeces) and disinfected upon returning to the ship or a base after a shore visit. Wear a mask to prevent inhalation during cleaning.
16. Field equipment disinfection procedures should be carried out prior to and after shore visits.

Further Guidance:

17. Further guidance is available in The Risk of Avian Influenza in the Southern Ocean: Practical Guide for Operators Interacting with Wildlife - <https://ecoevorxiv.org/8jrbu/>