

**HEALTH PROTECTION  
FRAMEWORK  
FOR THE RESPONSE TO AN  
INFLUENZA PANDEMIC IN  
SCOTLAND**

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## Abbreviations

ACDP	Advisory Committee on Dangerous Pathogens
AID	Avian Influenza database (in a pandemic this becomes the FF100 database)
CCC	Civil Contingencies Committee
CDSCNI	Communicable Disease Surveillance Centre, Northern Ireland
CEO	Chief Executive Officer
CEPR	Centre for Emergency Preparedness and Response
CHP	Community Health Partnerships
CMO	Chief Medical Officer
Cfi	Centre for Infections
CVS	Combined Vaccination Software – running on the GPASS platform
CSG	Core Strategic Group
DEFRA	Department of Environment, Food and Rural Affairs
DH	Department of Health
ECDC	European Centre for Disease Control
EISS	European Influenza Surveillance Scheme
FF100	First few hundred cases recorded in the AI database
GP	General Practitioner
GPASS	General Practice Administration System Scotland
GMP	Good Manufacturing Practice
HPA	Health Protection Agency
HPA Cfi	HPA Centre for Infections
HPS	Health Protection Scotland
HEPO	Health Emergency Planning Officer
HPU	Health Protection Unit
HSE	Health and Safety Executive
ITU	Intensive Therapy Unit
LaRS	Local and Regional Services
MOSA	Medical Officers of Schools Association
NAW	National Assembly of Wales
NHS	National Health Service
NHS 24	National telephone advice and General Practitioner access system
NHS Board	One of the 14 Scottish geographically based units of health delivery
NIBSC	National Institute of Biological Standards and Control
NIMR	National Institute of Medical Research
NIPC	National Influenza Pandemic Committee
NPHS	National Public Health Service (Wales)
ONS	Office for National Statistics
PIPER	Pandemic Influenza Primary care Reporting
PCT	Primary Care Trust
PWG	Pandemic Working Group
R&D	Research and Development
RCGP	Royal College of General Practitioners
RDsPH	Regional Directors of Public Health
SARS	Severe Acute Respiratory Syndrome
SECC	Strategic Emergency Co-ordinating Centre
SECT	Strategic Emergency Co-ordinating Team
SEHD	Scottish Executive Health Department
SE EPT	Scottish Executive Emergency Planning Team
SHA	Strategic Health Authority
SitRep	Situation Report
SOP	Standard Operating Procedure
UK	United Kingdom
WHO	World Health Organisation

## **Glossary of terms**

Antigenic drift	Point mutations leading to changes in antigenicity of the major H and N antigen subtypes of an influenza virus
Antigenic shift	Change in circulating major antigen (H and N) determinants either through exchange and reassortment of genetic material or adaptation to human transmission
Haemagglutinin	One of the two major surface proteins. Important for virus attachment to cells of the respiratory epithelium. Subtypes include H1 to H15. H1, H2 and H3 are the only described determinants involved in sustained human to human transmission
Neuraminidase	One of the two major surface proteins of the influenza virus. Less important for attachment but probably important for propagation and virulence. Subtypes N1 to N9.
Pandemic	Worldwide spread of a new influenza virus subtype
$R_0$	The basic reproduction number $R_0$ is the number of secondary cases produced by one case in a completely susceptible population. It depends on the duration of the infectious period, the probability of infecting a susceptible individual during one contact, and the number of new susceptible individuals contacted per unit of time. It varies between populations because of different contact rates.

## **Executive Summary**

Influenza is a familiar winter infection in the UK. Almost every year new drifted strains of influenza subtypes A and B emerge giving rise to morbidity and mortality, mainly in older persons and young children.

Pandemic influenza is different. A pandemic of influenza is the result of a new influenza A virus subtype emerging which is markedly different from its currently circulating predecessors and is able to: cause clinically apparent illness in humans; spread efficiently from person to person; and spread widely, because a high proportion of the population is fully susceptible (most people will have little or no immunity to the new virus because they will not have been infected or vaccinated with it or a similar virus before).

HPS and the Health Protection Units of each of the NHS Boards have a major role in supporting the preparations in Scotland for, and response to, an influenza pandemic. This plan puts the Health Protection response in the context of the overarching national arrangements laid out in the UK Health Departments' Influenza Pandemic Contingency Plan. It covers the Health Protection roles and responsibilities, and is intended for use by Health Protection staff and partner agencies working with HPS and the Health Protection Units of the NHS Boards. It updates the HP Framework for response to an influenza pandemic in Scotland published in June 2005.

The health protection response in Scotland has been developed in tandem with that of colleagues in the Health Protection Agency in England reflecting the close relationship between our organisations, our reliance in Scotland on HPA for delivery of specific health protection functions and the need to have a standard approach for health protection issues around pandemic influenza across the UK.

This Scottish framework describes the Health Protection roles of HPS and the NHS Boards in the event of an influenza pandemic, with the aim of providing a comprehensive and integrated response across these health protection organisations. The actions section clearly sets out the actions that will be implemented by HP staff (identified by job description) at each World Health Organization (WHO) designated pandemic influenza Phase and UK Alert Level. These include the actions HPS and the NHS Board Health Protection teams will take to meet their responsibilities as set out in the UK Health Departments' Plan and the actions that all National Services Scotland (NSS) & the NHS Boards will take to support the Health Protection Teams and to support the response of the National Health Service.

In addition to clearly describing the actions that will be taken by the HPS and HP Teams in each of the NHS Boards in response to an influenza pandemic, this framework provides a performance management tool that can be used to assist these organisations that will sit beneath this plan and detail their respective operational response. Detailed protocols for the management of suspect cases and contacts, together with control of infection guidelines are on the HPS (and HPA) websites.

The HP Framework for an influenza pandemic is an ongoing activity. This plan will be updated at least annually, and if necessary earlier should amendments to the UK National Plan or major developments in UK policy indicate. Comments to inform this review are welcome and can be submitted via the pandemic influenza pages on the HPS website.

## **Introduction**

This document outlines the Health Protection Framework for responding to an influenza pandemic in Scotland, and replaces all previous versions.

It sets out the actions that will be taken by HPS and the Health Protection Teams in each of the NHS Boards at each WHO designated pandemic influenza alert Phase and each UK Alert Level (within WHO Phase 6) and is intended for use by all Health Protection staff across Scotland.

It reflects the many lessons learned from the international debate and international, national and local exercises undertaken to test pandemic preparedness over the last year.

It indicates what is expected of NHS Boards' health protection services as part of that response. It is however important to make clear that it does not outline the non-health protection multifaceted approach to be taken by NHS Boards and their partners in local authority and other agencies across Strategic Coordinating Groups (SCG's) to manage the societal problem that pandemic influenza would represent. It is expected that the individual SCG's will address this with their NHS partners as part of the integrated response to manage pandemic flu in Scotland.

The Scottish Executive Health Department (SEHD) remain responsible for the strategic co-ordination and overall direction of the health response in Scotland. NHS Boards' Public Health Departments (usually through Health Protection Teams), on behalf of their local population, will be responsible for the tactical and operational response to an influenza pandemic. In line with its overall remit and under the direction of SEHD, HPS will have responsibility for ensuring a consistent health protection response throughout the country and monitoring the overall epidemiological situation and the impact of control measures on it. In doing so it will collaborate closely with its UK partner health protection organisations.

This response framework is closely aligned with the Health Protection Agency's Influenza Pandemic Contingency Plan.

([http://www.hpa.org.uk/infections/topics\\_az/influenza/pandemic/fluplan.htm](http://www.hpa.org.uk/infections/topics_az/influenza/pandemic/fluplan.htm)).

This reflects a deliberate approach to coordinate health protection activity across the UK since the bulk of Health Protection guidance and scientific work during a pandemic will be undertaken by HPA with input from HPS and the devolved administration health protection teams.

In an attempt to assist the reader in navigating their way through the escalating phases of an influenza pandemic each phase of the framework is consistently colour coded to allow the reader to immediately match the appropriate HPA/HPS avian influenza/pandemic influenza clinical management and investigation algorithms on their respective websites with the WHO Phase within the framework document.

## **Aims**

The Health Protection Framework aims to:

- Provide a tactical framework for the health protection response to an influenza pandemic in Scotland .
- Puts the Health Protection Framework for the response to an influenza pandemic in Scotland in the context of the overarching national arrangements laid out in the UK Health Departments' Influenza Pandemic Contingency Plan, the Health Protection Agency Pandemic Influenza Plan and the HPS Emergency Response Plan.
- Ensure that Health Protection resources of host organisations are effectively mobilised to support the national response to an escalating threat from a novel influenza subtype and an influenza pandemic itself, led by DH and discharged by the Scottish Executive in Scotland, in the areas of detection, risk assessment, diagnosis, management, control and prevention and communications.
- Provide clear guidance, through the allocation of actions and roles in relation to job descriptions, in order that all Health Protection Services can develop more detailed operational plans for their own parts of the response, including the development of local and regional arrangements with National Health Service (NHS) colleagues.

## **Objectives**

HPS and the NHS Board Health Protection teams will maintain their capability and capacity to meet their responsibilities at all times. This will necessitate the implementation of programmes for service development and improvement, (and for research), in order that the necessary expertise is maintained and practiced.

Specific Health Protection objectives set out in line with the UK Health Department's Influenza Pandemic Contingency Plan are to:

- Through ECDC, WHO & HPA contribute to international surveillance.
- Provide specialist public health advice together with operational and investigative support, to SEHD, the NHS in Scotland, Regional and Local Strategic Coordinating Groups/ Pandemic Influenza Coordinating Groups and other agencies with formal responsibilities for dealing with pandemic influenza
- Producing timely, accurate and consistent information for the public and health professionals
- Provide early warning alerts and risk assessments to SEHD to share with DH, including early warning of a second wave, or of the emergency of a second pandemic strain
- Support a coordinated national public health response to pandemic influenza
- Support NHS organisations in preparing for and responding to an influenza pandemic.
- In partnership with the HPA and other Devolved Administrations' public health agencies, provide a co-ordinated UK national public health response
- Contribute to reference virological and microbiological services for the UK
- Contribute to the characterisation of strains of influenza virus isolated in the UK, both through routine and structured sampling, to enable recognition of a novel virus and/or its introduction into Scotland, England, Northern Ireland and Wales and antigenic divergence.
- Contribute to the continuous assessment and monitoring of influenza antiviral susceptibility
- If indicated, periodically re-assess the antibody status of a representative cross section of the Scottish population
- Assess the spectrum of secondary bacterial infections complicating influenza and their antimicrobial susceptibility, and make recommendations to incorporate into clinical guidance
- Lead the laboratory investigation of samples, arrangements for laboratory testing and development of a strategy for escalation

- Co-ordinate national influenza surveillance by obtaining, analysing and distributing information on national and international influenza activity, including laboratory and clinical data (as well as being partners in the receipt of secondary care and death information to allow best interpretation of available data).
- Provide SEHD, DH and HPA colleagues with virological and epidemiological data to allow monitoring of the spread and impact of the pandemic on which UK national decisions are based
- Provide modelling data to SEHD and share this with HPA & DH, in advance of a pandemic, to assist in planning, and during a pandemic, to provide real time estimates of likely impact and evaluate the impact of potential intervention strategies
- Co-ordinate development of UK national guidelines for health professionals and other essential services as requested by SEHD & DH.
- Support the SEHD in its communications strategy by providing expert spokespeople and timely technical briefing information and guidance for the media and stakeholders
- Ensure that information is consistent, accurate and clear so that the SEHD and other partners can also make use of it in their communications initiatives
- In Scotland, through NHS Board Health Protection Units, support and facilitate the local public health response, support Primary Care Divisions and local authorities in their response and ensure cross linkages between HPU and NHS units are specified in local plans
- Provide specialist emergency planning advice to SEHD, the NHS (Scotland) and Scottish Local & Regional Directors of Public Health.
- Provide advice to support local decision making about measures to control the spread of the virus,
- Monitor vaccine uptake and effectiveness, when vaccine becomes available and assist and support the distribution arrangements for this vaccine.
- To investigate the transmission, morbidity, case fatality and broader impact of the pandemic and the effectiveness of measures to combat it
- To take measures to prevent transmission and reduce the morbidity, case fatality and broader impact of the pandemic by
  - Facilitating and supporting the detection, isolation and management of cases
  - Facilitating and supporting infection control measures
  - Facilitating and supporting the targeting and use of antivirals
  - Facilitating and supporting the targeting and use of vaccine

## **Scope**

- Health Protection Scotland has specific responsibilities within Scotland and this document refers to these arrangements. However, HPS cooperates closely with the HPA and its equivalent agencies in Northern Ireland and Wales. In the event of a pandemic HPS would share surveillance data from Scotland with the HPA to allow their collation of a composite picture of activity across the UK with their provision of daily updates to the Department of Health Operations Room and Civil Contingencies Committee. The relationship between HPS and each of these organisations is demonstrated in the figure below (Figure 1).
- The Scottish Executive Health Department (SEHD) remain responsible for the strategic co-ordination and overall direction of the health response in Scotland. NHS Boards' Public Health Departments (usually through Health Protection Teams), on behalf of their local population, will be responsible for the tactical and operational response to an influenza pandemic. In line with its overall remit and under the direction of SEHD, HPS will have responsibility for ensuring a consistent health protection response throughout the country and monitoring the overall epidemiological situation and the impact of control measures on it. In doing so it will collaborate closely with its UK partner health protection organisations. This process is greatly facilitated by the attendance of the health protection teams from the devolved administrations at each of the regular HPA Influenza & Respiratory Virus Programme Board meetings at which mutual exchange of information and ideas takes place.
- In developing this plan account has been taken of SEHD Guidance on the Management of Public Health Incidents.
- The uncertainties in the nature and scope of any pandemic are very large. To address this, the framework is based on certain Planning Assumptions and Control Principles mirroring those considered across the UK. These in turn are underpinned by an assessment of the possible burden of illness. The next section of this document presents relevant information of these assumptions.
- The Framework provides a matrix of integrated responses at the local, regional and national levels set against these phases and levels. As far as possible, the matrix presents a series of broad functions categorised as:
  - Co-ordination;
  - Surveillance;
  - Investigation;
  - Risk assessment;
  - Control Measures;
  - Communication;
  - Learning lessons.
- The matrix should be regarded as a default set of functions for which a series of actions are required to discharge each function. The previously mentioned uncertainties in any pandemic mean that the actual characteristics of the pandemic may be different from the planning assumptions. Similarly, whilst health protection is at the core of the framework, it has to have the flexibility to deal with situations where the pandemic could have, or has had, a major impact on the national infrastructure. Thus in addition to specifying a set of default actions the framework provides a framework for decision making that will enable flexibility to deal with the specific needs of the situation.

- An important collaborator in all of the functions and actions to be discharged by HPS will be the Scottish Executive Health Department.
- Importantly while the framework within this document covers all the functions and actions to be discharged by the NHS Board Health Protection Teams it leaves the list of collaborators who would assist in the discharging of these functions and actions to the discretion of the local NHS Board HP Team to compile. Within the role of HPS to advise, support and coordinate the health protection response across Scotland it is assumed that for many of the functions and tasks that would be undertaken by NHS Board Health Protection Teams will involve HPS as a key collaborator. The Department of Health is the lead government department in England for coordinating the response to an influenza pandemic. However it will also perform many lead agency functions for the devolved administrations of Scotland, Wales and Northern Ireland and take overarching responsibility for the UK response.
- The Health Protection Framework for the response to an influenza pandemic in Scotland should be interpreted in the context of the UK Health Department's Influenza Pandemic Contingency Plan, being in effect a sub-plan of the UK Health Department's plan.
- The overall aim of the plan is to ensure that all Health Protection the resources of HPS and the NHS Boards will be brought to bear effectively in the provision of advice, specialist capabilities and supporting services to SEHD, the NHS and others with responsibilities in responding to an Influenza Pandemic.
- The structure of the plan utilises the WHO pandemic influenza Phases and UK Alert Levels as described in the 'UK Health Department Pandemic Influenza Contingency Plan', and provides a matrix of integrated responses from Health Protection against these phases and levels.
- This plan sits within the HPS Emergency Response Plan.

## **Planning and Role Assumptions**

### **Time to availability of vaccine**

The time from first virus isolation to production of large quantities of standardised monovalent vaccine will be between four to six months (assuming a prior commitment to funding for vaccine development and production).

### **Supply of vaccine**

In the short term, production capacity and delivery of the vaccine in the UK may be limited.

### **Number of doses of vaccine required**

For novel subtypes (e.g. H5N1) in completely unprimed populations a single dose of vaccine is likely to provide incomplete protection. Two standard doses may be necessary for complete clinical protection. The most likely dose regimen will be 2 x 15mcg with adjuvant or 2 x 7.5mcg with adjuvant, but further studies are needed to explore this issue.

### **Effectiveness of neuraminidase inhibitors**

Prophylaxis: Likely to be effective in preventing illness (efficacy 80%).

Treatment: Likely to be effective in shortening illness, lessening morbidity and reducing hospital admissions if given within 48 hours after onset of symptoms (shortens average illness period by one day). Limited data from epidemic influenza suggests treatment to have an efficacy of around 50% for the prevention of severe outcomes if administered within 48 hours of symptom onset.

### **Roles**

The HPA provides expert virological, modelling and epidemiological advice to the Department of Health. In a similar fashion HPS provides expert epidemiological and virological advice to SEHD. This has contributed to the development of the planning assumptions presented in the UK Health Departments' Influenza Pandemic Contingency Plan. The same assumptions have been used in the preparation of the Health Protection Framework for the response to an influenza pandemic in Scotland.

- It should be noted that this is ongoing work and the Health Protection Framework for the response to an influenza pandemic in Scotland will be revised and updated following any resulting changes in planning assumptions.
- HPS and all NHS Board Health Protection units will develop and maintain business continuity planning through WHO pandemic influenza Phases 1, 2 and 3, for implementation through Phases 4, 5, and 6.
- The HPS influenza lead and the Scottish Executive Pandemic Influenza Team will move HPS through the WHO Phases 3-5 (as notified by WHO). The Director of HPS will move HPS through UK Alert Levels in WHO Phase 6 (as notified by the CMO, Scotland).
- The Director of HPS carries overall responsibility for ensuring that HPS has the capability and capacity to respond to an influenza pandemic whilst the Directors of Public Health in each of the NHS Boards carry responsibility for their respective NHS Boards Health Protection function.
- It is the HPS Emergency Response Group's responsibility to ensure that the actions within HPS are implemented in a seamless and timely manner, by WHO Phase and UK Alert Level.
- The HPS Influenza lead and the HPS ERG takes responsibility on behalf of the HPS Director and HPS CMT to ensure that all the workstream activities are facilitated and coordinated to deliver the capability required, and reports periodically to the HPS CMT and HPS Advisory Group.
- The Director of HPS will assess vulnerabilities and report recommended actions to the HPS CMT and HPS Advisory Group.
- This plan will provide a performance management and benchmarking tool for use within HPS and NHS Boards.
- The 'implementer' identified against each action in the plan is responsible for ensuring the action allocated to them is implemented but may choose to delegate the action according to local considerations (indeed resilience planning should result in the roles of the individual being cross-covered by other individuals if sufficient seniority to achieve them).

- The Avian Influenza DataBase (AIDB) is intended to capture detailed epidemiological and virological information on all UK human cases of a novel influenza subtype in WHO Phases 3, 4 and 5 and on the first few hundred cases (FF100) of a pandemic virus in WHO Phase 6. It will cease to operate once large numbers of pandemic influenza cases are occurring in the UK, at which point aggregate reporting will prevail.
- The Avian Influenza DataBase (AIDB) has been adopted by public health partner agencies in the Devolved Administrations with the intention of providing a consistent UK wide picture.
- HPS has a long standing history of using information from general practice to monitor the impact of influenza on the population. Enhancement to this surveillance of Influenza in Scotland is now being undertaken by the **P**andemic **I**nfluenza **P**rimary **car**E **R**eporting (PIPER) scheme. This development is currently piloting the use of information derived from Scottish practices using GPASS as their practice management system to derive data on influenza vaccine uptake by risk group, trend data on influenza like illness (ILI) and acute respiratory infections (ARI) and vaccine (and antiviral and antibiotic) effectiveness. NHS Boards then fulfil their requirement to have robust primary care surveillance in place by the provision of operational support for this scheme. Standardised daily output on ILI and ARI will then be available from this to complement systems across the UK in a harmonised approach across England and the devolved administrations.

## **Specific roles and responsibilities of HPS and the Health Protection Teams of the NHS Boards**

### **Health Protection Scotland**

The functions of HPS in an influenza pandemic fall into the following broad areas:

- Participation in HPA-led UK arrangements to ensure as far as possible a consistent UK-wide public health response
- Provision of expert advice and assistance in the overall strategic management of the response in Scotland through SEHD (SEHD co-ordinate the health response to a pandemic) and the HPA
- Co-ordination and support of the public health response by NHS Boards in Scotland at a tactical level and monitoring of the level and impact of the measures they put in place.
- Liaison with SEHD on strategic issues and with HPA on UK issues.
- Provision of scientific operational and logistical support to NHS Boards and Strategic Co-ordinating Groups (in particular advice and support to the JHAC) on public health management and the health protection response.
- Monitoring of new consultations for influenza-like illness and other respiratory infections in primary care.

- Co-ordination and ongoing interpretation of all influenza related surveillance activity in Scotland as well as monitoring the international situation to provide information on which decisions can be based.
- Communication of surveillance information through professional communications, official press statements, regular updates in the HPS Weekly Report and HPS website, and responding to press enquiries in collaboration with SEHD and the HPA.
- Development of national guidelines/algorithms for health professionals in Scotland working with the HPA to ensure a consistent UK approach.
- Monitoring vaccine and antiviral uptake and estimating vaccine and antiviral effectiveness in Scotland.
- Provision of advice to SEHD and NHSScotland on the scope and effectiveness of the overall public health response.
- Reporting to SE led groups on all of the above.
- Provision of Scottish data to the HPA for the overall UK figures, and a contribution to daily sitrep reports for SEHD, SECC, and CCC.

An important collaborator in all of the functions and actions to be discharged by HPS will be the Scottish Executive Health Department.

### **NHS Boards Health Protection Teams**

As indicated in the UK Departments of Health Pandemic Influenza Contingency Plan, NHS Boards in Scotland should have contingency plans which cover both the health protection and general healthcare response and appoint an influenza co-ordinator, normally the Director of Public Health, and a pandemic planning committee with appropriately wide representation. They will lead the co-ordination of the work of NHS divisions in responding to the influenza pandemic. This will involve ensuring that the NHS has appropriate command and control structures with its local partners, that escalation policies are clearly described and that mutual aid arrangements are in place.

The role of health protection teams as part of these arrangements will vary across NHS Boards but as indicated in the UK Health Departments' plan their response should correspond to guidance from HPS. The specific health protection response put in place by NHS Boards for pandemic influenza will entail:

- Appropriate command and control structures, escalation policies and links to other sectors
- Participating in and contributing to nationally co-ordinated surveillance programmes;
- Reviewing local diagnostic capacity and arranging to have local laboratories investigate influenza like illness (ILI), isolate strains of influenza, test antimicrobial susceptibility of secondary bacterial infections and report findings for local and UK surveillance according to UK-wide agreed protocols.
- Investigating specific local issues related to the epidemiology and control of pandemic flu and participating in and contributing to any nationally co-ordinated investigations;

- Acting within a national framework, assessing the risk to the resident population from specific activities;
- Providing expert advice and guidance and depending on local arrangements, co-ordinating the implementation of relevant control measures especially:
  - arrangements to immunise essential staff according to UK guidelines.
  - plans for emergency vaccination programmes according to UK guidelines, including an estimate of local vaccine and antiviral needs and arrangements for ensuring the vaccine and antivirals are distributed and administered appropriately.
  - infection control measures especially in healthcare settings;
  - the isolation and exclusion of cases and contacts;
  - social distancing measures such as the cancellation of mass events or school closures.
- Participating in and contributing to programmes to evaluate the impact of these measures.
- Communication arrangements to healthcare professionals, the public and media, including timely cascade of information from national and international sources.
- A media handling strategy.
- Participating in and contributing to programmes to capture any lessons learnt.

NHS Board Health Protection Teams should ensure that they liaise closely with their local and regional microbiological and virological laboratories which will:

- Investigate influenza-like illness and isolate strains of influenza viruses in Scotland.
- Identify and assess antimicrobial sensitivities of bacteria giving rise to complications of influenza.
- Report findings for local, Scottish and UK surveillance according to UK wide agreed protocols.
- Liaise with NHS Boards and HPS on the development and implementation of surveillance programmes.
- Submit isolates to the HPA Centre for Infection (Cfi) at Colindale for strain characterisation according to nationally agreed protocols.

Importantly while the framework within this document covers all the functions and actions to be discharged by the NHS Board Health Protection Teams it leaves the list of collaborators who would assist in the discharging of these functions and actions to the discretion of the local NHS Board HP Team to compile.

Within the role of HPS to advise, support and coordinate the health protection response across Scotland it is assumed that for many of the functions and tasks that

would be undertaken by NHS Board Health Protection Teams will involve HPS as a key collaborator.

## **Summary of the Epidemiology of Pandemic Influenza**

Influenza is an acute viral infection typically characterised by the clinical triad of: sudden onset, fever, and cough; with or without a sore throat or other respiratory symptoms. Other common symptoms include headache, prostration and muscle and joint pains. The acute symptoms can last for about one week, although full recovery may take longer. Influenza is a seasonal illness, occurring predominantly in a six to eight week period each winter. The very young, the elderly and people with underlying medical conditions such as heart or chest disease are at particular risk of serious illness from influenza and its complications (mainly bacterial pneumonias). Around 12,000 influenza-related excess deaths per annum are estimated to occur, predominantly among the elderly, in England and Wales while in Scotland the corresponding figure is estimated to be around 10% of this. Variants of influenza A/H3N2 and A/H1N1 and influenza B circulate worldwide.

### **Pandemic influenza**

The factors underpinning the planning assumptions and from which they are derived are set out in UK Departments of Health Pandemic Influenza Contingency Plan.

Pandemic influenza occurs when a new subtype of influenza A emerges in humans, which is capable of producing clinical illness, spreads efficiently, and against which there is little or no pre-existing immunity in the worldwide population. As a consequence, the scale and severity of illness (and hence consequences) of a pandemic are likely to be of a substantially higher order than even the most severe winter epidemics. There may also be changes in the age-distribution of cases compared with non-pandemic years; mortality in typical seasonal influenza is usually confined to older age groups but in pandemics may be increased in younger age groups. The size of any increase in morbidity and mortality and the extent to which a shift in age distribution occurs will depend on a variety of factors including the nature of the pandemic virus and pre-existing immunity. In the 20<sup>th</sup> Century, pandemic occurred in 1918 (A/H1N1), 1957 (A/H2N2) and 1968 (A/H3N2).

#### **Mode of transmission**

Droplet transmission (>5 µm) occurs

Airborne or aerosol transmission (<5 µm particle size) occurs

Role of transmission through contact with live virus particles on surfaces unclear.

#### **Environmental factors**

Virus survival is considerably enhanced in conditions of cold temperature and low relative humidity.

#### **Incubation period**

One to three days, typically two.

#### **Period of communicability**

Up to 6 days from exposure to the virus, but typically 3-5 days from onset of fever. Virus shedding may be detectable 24 hours before onset of illness in some adults. Children generally shed the virus for longer periods – up to 6 days prior to onset of symptoms and up 14 days afterwards, or 21 if immunocompromised.

### **Likely $R_0$ in UK setting**

In the absence of vaccination and control measures the reproduction number is approximately 1.4 to 1.8 in a susceptible UK population.

### ***Clinical attack rate***

In the previous pandemics of the 20<sup>th</sup> Century, clinical attack rates (proportion of population with symptomatic illness) have occurred in the range of approximately 25-35% (cumulative).

### ***Case fatality rate***

In the previous pandemics of the 20<sup>th</sup> Century, case fatality rates (proportion of persons with symptomatic illness who died) have varied widely between 2-2.5% in 1918 to <0.5% in 1957 and 1968

### ***Age-specific impact***

Age specific impact is difficult to predict in advance. In the UK in 1918, a dramatic shift in age-specific impact (morbidity and mortality) occurred towards younger adults whereas the pandemics in 1957 and 1968 impacted across the age range of the population in a fashion much more akin to seasonal influenza (greatest impact in the elderly).

### ***Timing and seasonality***

Although pandemic viruses may emerge at any time of the year, evidence from the three pandemics of the 20<sup>th</sup> Century suggests nevertheless that they inflict maximum impact during the next winter season. Of the influenza pandemics of the 20<sup>th</sup> Century, that of 1918/19 produced three separate epidemic waves each separated by 3-6 months; one wave in the pandemic of 1957; and two in the pandemic of 1968/69.

## **Summary of Modelling Work**

Mathematical models have been used to explore the possible spread and impact of pandemic influenza in the 21<sup>st</sup> century as well as the effectiveness of potential control programmes. The models have been parameterised by comparing their results to data from previous pandemics. Much uncertainty remains due to a scarcity of data from these pandemics, changes in contact patterns and health systems, and uncertainty in the epidemiology of a new (and unknown) pandemic influenza virus. In addition, the efficacy of interventions has either been assumed (i.e. there is no direct evidence for an effect), or based on analysis of data from epidemic influenza. Nevertheless, the results of the models broadly suggest that:

- A new pandemic might be containable at source (assumed to be in South East Asia) through rapid (almost immediate) application of a combination of stringent social distance measures, area quarantine and geographically targeted antiviral prophylaxis (requiring up to 3 million courses of antivirals) (Ferguson et al. 2005 Nature 437(7056):209-14).
- Similar containment strategies to prevent a pandemic spreading in the UK are unlikely to be effective as simultaneous, multiple importations would be expected, and antiviral stocks would be rapidly depleted (Ferguson et al. 2006 Nature 442(7101):448-52).

- International travel restrictions are unlikely to delay an epidemic significantly (Cooper et al. 2006 PLoS Med. 3(6):e212; Ferguson et al. 2006 Nature 442(7101):448-52).. For instance, imposing a 90% restriction on travel to the UK might delay the peak of a pandemic by only 1 to 2 weeks (Ferguson et al. 2006 Nature 442(7101):448-52). Entrance screening at airports is unlikely to be effective at preventing or delaying an epidemic, as most of those who board a flight incubating influenza would not display symptoms until after arrival and so would not be prevented from entering the country (Pitman et al. 2005 BMJ 331(7527): 1242-3).
- Prompt treatment with neuraminidase inhibitors can reduce the severity of disease in patients, and if used widely and rapidly enough might also reduce overall clinical attack rates. Treatment combined with household prophylaxis would be more effective (Ferguson et al. 2006 Nature 442(7101):448-52), but would require more doses than are currently available in the UK stockpile. Using near-patient tests before distributing antivirals in the community is unlikely to be effective or cost-effective (Siddiqui et al. submitted).
- Pre-first wave vaccination strategies (even with a poorly matched vaccine) could be more effective than strategies targeted at preventing or mitigating a second wave, partly because there may only be a single wave. Targeting children may be more effective than other age groups (HPA unpublished data).
- School closure might reduce clinical attack rates in children and slow epidemic spread somewhat (Ferguson et al. 2006 Nature 442(7101):448-52).

Vaccination with a pandemic vaccine is probably the most effective intervention in the medium to long term. Optimal vaccination strategies (in the likely event of initial vaccine scarcity) will need to be determined in light of the specific characteristics of the pandemic.

During a pandemic it is intended to fit models to emerging surveillance data (available from the Avian Influenza DataBase and other aggregate reporting systems) to provide estimates of epidemic progress to date and the possible future demand for health services. In England much of this work will be undertaken on behalf of the DH by HPA and other researchers to generate information for all of the UK. In Scotland specific work will also be undertaken by Strathclyde University Department of Statistical and Modelling Science (STAMS) on data particularly applicable to the NHS in Scotland.

## **Summary of Pandemic Infection Control Assumptions**

Infection control assumptions for pandemic influenza are based on current knowledge about seasonal influenza viruses

- Person-person spread of human influenza viruses is well established
- The patterns of transmission observed during nosocomial outbreaks of influenza suggest that large droplets and contact (direct and indirect) are the most important and most likely routes of spread
- Airborne or fine droplet spread may occur in some settings (e.g. during the performance of aerosol generating procedures in healthcare settings)
- The incubation period of human influenza ranges from 1-4 days (typically 2-3)
- Infectivity is proportional to symptom severity and maximal just after the onset of symptoms

- The period of communicability is typically up to 5 days after symptom onset in adults and 7 days in children, although longer periods of virus shedding have been documented in a small proportion of children
- Virus excretion may be considerably prolonged in immunocompromised patients
- Virus may be recovered from infected but pre-symptomatic persons, but there is little published evidence to support person-person transmission of influenza from a pre-symptomatic individual to a susceptible host.
- Seasonal influenza viruses can survive on environmental surfaces, especially so on hard non-porous materials (up to 48h)
- Influenza viruses are easily deactivated by washing with soap and water, alcohol based hand sanitizers, and cleaning with normal household detergents and cleaners.

Pandemic infection control measures in all general settings will be based around:

- Persons with symptoms staying in their own homes
- Persons who develop symptoms at work or whilst away from home, returning to home as quickly as reasonably possible
- Good respiratory hygiene practiced by all
- Frequent hand-washing practiced by all
- Appropriate cleaning of frequently touched hard surfaces in the home and in public places
- Avoidance of unnecessary contact with others and unnecessary overcrowding (reduction of contact rates)
- Rapid access to antiviral treatment for symptomatic persons (reduction in transmissibility)

In health and communal care settings, additional measures will include:

- Protection of staff with a vaccine effective against the pandemic flu strain (if available)
- Prompt recognition (and treatment) of staff with influenza
- Exclusion of staff with respiratory symptoms
- Segregation of staff into those dealing with influenza patients and those not (with exceptions)
- Maintaining physical and/or temporal separation between 'flu' and 'non-flu' patients/clients
- Standard Infection Control Principles
- Droplet Precautions
- Personal Protective Equipment according to risk of exposure
- Environmental cleaning and disinfection

## WHO International Phases and UK Alert Levels

WHO Phases		UK Alert levels
<b>Inter-pandemic period</b>		
<b>Phase 1</b>	No new influenza virus subtypes have been detected in humans. An influenza virus subtype that has caused human infection may be present in animals. If present in animals, the risk of human infection or disease is considered to be low.	
<b>Phase 2</b>	No new influenza virus subtypes have been detected in humans. However, a circulating animal influenza virus subtype poses a substantial risk of human disease	<i>UK not affected</i> <b>OR UK has strong travel/trade connections with affected country</b> <b>OR UK affected</b>
<b>Pandemic Alert Period</b>		
<b>Phase 3</b>	Human infection(s) with a new subtype, but no new human-to-human spread, or at most rare instances of spread to a close contact.	 <i>UK not affected</i> <b>OR UK has strong travel/trade connections with affected country</b> <b>OR UK affected</b> 
<b>Phase 4</b>	Small cluster(s) with limited human-to human transmission but spread is highly localised, suggesting that the virus is not well adapted to humans	
<b>Phase 5</b>	Large cluster(s) but human-to human spread still localised, suggesting that the virus is becoming increasingly better adapted to humans, but may not yet be fully transmissible (substantial pandemic risk).	
<b>Pandemic Period</b>		
<b>Phase 6</b>	<p>Pandemic phase: increased and sustained transmission in the general population</p> <p>Past experience suggests that a second, and possibly further, waves of illness caused by the new virus are possible 3-9 months after the first wave has subsided depending on seasonality. The second wave may be as, or more, intense than the first</p>	<p style="text-align: center;"><b>UK Alert Levels</b></p> <hr style="border-top: 1px dashed black;"/> <p>1 Virus/cases only outside the UK</p> <hr style="border-top: 1px dashed black;"/> <p>2 Virus isolated in the UK</p> <hr style="border-top: 1px dashed black;"/> <p>3 Outbreak(s) in the UK</p> <hr style="border-top: 1px dashed black;"/> <p>4 Widespread activity across the UK</p>
<b>Post-pandemic Period</b>		
Return to inter-pandemic arrangements		

### Implications for the UK

A pandemic is thought most likely to start outside the UK, and to become established in other countries before reaching the UK. For the UK, four alert levels are described in the UK Health Departments Contingency Plan:

Alert level 1	Cases due to pandemic virus only outside the UK
Alert level 2	New pandemic virus isolated in the UK (pandemic imminent in the UK)
Alert level 3	Outbreak(s) due to new pandemic subtype in the UK

Alert level 4      Widespread pandemic activity across UK

The hierarchy may change if influenza due to the pandemic strain is occurring close to UK, for example, in Western Europe. The UK Health Departments Contingency Plan also covers the contingency that the UK becomes involved earlier than this but in both the UK Health Departments Contingency Plan and HPS plans, in terms of specific action, UK alert levels 1-4 are assumed to occur within WHO phase 2.

### **Transition between phases**

Transition between phases may be rapid and the distinction blurred. The crucial interval is between phases 1 and 2, which will determine to a large extent whether vaccine will be available in time for the first wave of illness in Scotland or the rest of the UK.

HPS will mirror the activity of the Influenza Team of the HPA Centre for Infections; continuously monitoring global influenza activity, and where appropriate convening a meeting of the HPS Emergency Response Group/HPA Rapid Assessment Group for Pandemic Influenza to review changes in influenza activity that might presage a pandemic threat. The HPA Group includes experts from the WHO UK Collaborating Centre (Mill Hill) and NIBSC and a representative of the DH. The Group advises the HPA on the need to convene the HPA Pandemic Working Group (PWG).

### **HPS and HPA involvement in mechanisms for changing Alert Status in the UK**

HPS will follow the lead provided by the HPA. On being informed by WHO of the isolation of a new influenza virus with pandemic potential (normally when person to person spread has been confirmed, i.e. Phase 0.3), the UK Secretary of State, on the advice of the Chief Medical Officer (England), will convene the National Influenza Pandemic Committee (NIPC). The DH (England) will inform the Devolved Administrations and the Civil Contingencies Committee. The Civil Contingencies Secretariat will inform other Government Departments.

On receipt of confirmation from WHO of the onset of a likely pandemic, the DH will immediately cascade this information to the Devolved Administrations, the HPA, the Civil Contingencies Secretariat, other Government Departments and Agencies and the NHS. The Scottish Executive Health Department will inform HPS (it is likely that HPS will be informed in parallel by the HPA).

In exceptional circumstances, the DH (England) may convene their NIPC on the strength of advice from the HPA [or the National Expert Panel on New and Emerging Infections/NEPNEI] in the absence of, or where this differs from, advice from WHO, on the grounds of national interest. The UK may also implement its pandemic plans in the absence of a WHO declaration, on the advice of the NIPC, and after consultation with other European Member States through the European Communicable Diseases Network.

Should a potential pandemic subsequently fail to evolve, the NIPC will be stood down and other bodies including the HPA informed.

## THE RESPONSE FRAMEWORK

### Health protection actions during an Influenza Pandemic by WHO Phase and UK Alert level

(Note each of the WHO phases is consistently colour coded across Health Protection responses in the UK including the management algorithms on the HPS & HPA websites).

#### 1. Actions\* during the WHO Phases 1 & 2

##### WHO PHASES 1 & 2: INTERPANDEMIC PERIOD

###### Definition

###### Phase 1

No new influenza virus subtypes have been detected in humans. An influenza virus subtype that has caused human infection may be present in animals. If present in animals, the risk of human infection or disease is considered to be low.

###### Phase 2

No new influenza virus subtypes have been detected in humans. However, a circulating animal influenza virus subtype poses a substantial risk of human disease.

###### Key issues: *maintain and strengthen routine activity*

- Detect emergence of drift variants and new influenza strains
- Detect onset of annual or biannual outbreak
- Describe patterns of morbidity and mortality and influenza burden
- Contribute to annual vaccination strategy

###### Key planning assumptions for Scotland

- Cases do not exceed system capacity to cope
- First cases in the new pandemic occur outside the UK and evolution of the pandemic allows an orderly escalation through WHO phases

#### 1.1 Health Protection Scotland

Function	Action	Implementer
Co-ordination	Ensure the HPS is prepared to respond to an influenza pandemic (includes maintenance of other essential non-flu work and reprioritisation)	Director HPS
“	Coordinate the HPS's expert advice to Scottish Executive Health Department	Programme Lead for Influenza
“	Monitor and coordinate HPS responses to international requests for briefings and expertise on pandemic influenza in conjunction with HPA	Clinical Director in liaison with Human Resources
“	Liaise with Scottish Microbiology Network to send selected positive specimens to the West of Scotland Specialist Virology	Liaise with Scottish Microbiology/Virology Laboratories

\* The actions listed in each phase assume that the actions in the previous phase have been implemented. Where a phase or phases are passed over e.g. a move from phase 4 direct to phase 6 the actions in the intermediary phases should also be implemented.

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	Laboratory or Edinburgh Royal Infirmary Virus Laboratories.	
“	Establish protocol to ensure submission of samples to Cfl from positive Scottish samples	Consultant Microbiologist HPS
“	Explore increasing capability for virus culture work to assist the UK in developing resources to increase UK resilience for laboratory containment work	Scottish Virology Network in liaison with Cfl influenza laboratory
Surveillance	Maintain and develop routine national surveillance and reporting systems for influenza	Influenza Lead Respiratory and Immunisation section
“	Contribute to WHO and EU influenza surveillance activities	Influenza Lead Respiratory and Immunisation section
Investigation	Undertake modelling studies to support pandemic influenza contingency planning and pandemic exercise planning. Including modelling to assess possible therapeutic, public health and social interventions.	Influenza Lead Respiratory and Immunisation section in conjunction with Strathclyde University Statistical Team – STAMS
“	Support HPS/STAMS modelling work by undertaking modelling studies to support pandemic influenza contingency planning and pandemic exercise planning. Including modelling to assess possible therapeutic, public health and social interventions	ERG, Respiratory and Immunisation section in conjunction with Strathclyde University Statistical Team – STAMS
Risk assessment	Assess threat to UK posed by influenza activity abroad	Influenza Lead Respiratory and Immunisation section
“	Establish arrangements for reference virology services for influenza	Influenza Lead Respiratory and Immunisation section
Control	Review and advise NHS Board Health Protection Teams on their avian and pandemic influenza response arrangements	Quality Assurance officer HPS in liaison with Respiratory and Immunisation section
Communications	On an annual basis – or as circumstances determine - assess whether this plan remains fit for purpose or needs updating	HPS EPO with Influenza programme lead
“	Develop internal key message documents, Q&As, draft statements, press release templates in liaison with HPA for potential scenarios. These to be shared with Scottish Executive Health Department when finalised	HPS Communications Team
“	Provide input to SEHD on communications material as required	HPS Communications Team
“	Develop a communications strategy and media handling plan in liaison with SEHD Communication Team including handling protocol	HPS Communications Team in Liaison with SEHD Comms

“	Identify national/regional spokespeople	HPS Communications Team
“	Assist SEHD to develop and agree communications strategy and media handling plan in liaison with NHS Boards	HPS Communications Team in liaison with NHS Board Communications Managers
Learning Lessons	Conduct pandemic planning exercises in conjunction with other agencies	Emergency Planning Officer in Liaison with ERG & Respiratory and Immunisation section
“	Develop and implement programme to exercise the HPS Pandemic Influenza Contingency Plan internally	Emergency Planning Officer in Liaison with ERG & Respiratory and Immunisation section

## 1.2 NHS Board Health Protection Teams

Function	Action	Implementer
Coordination	Conduct formal annual review and generate a report of HPU influenza contingency plans and pandemic arrangements and ensure closeness of fit with local and regional resilience and NHS plans	Director of Public Health (or their designated Pandemic Flu Coordinator)
“	Support annual Community Health Partnerships (CHP's)/Primary Care Divisions (PSD's) arrangements to immunise elderly and high-risk groups against influenza and ongoing programme of vaccination against pneumococcal disease	Director of Public Health (or their designated Pandemic Flu Coordinator)
Surveillance	Work with local partners to ensure influenza outbreak detection are reported to HPS & SEHD with appropriate proportionate response in schools, nursing homes and other institutions	Director of Public Health (or their designated Pandemic Flu Coordinator)
Investigation	In outbreaks of unusual severity or public health importance report these to HPS & SEHD	NHS Board flu lead
Risk Assessment	Consider implication of threat to local population by influenza activity abroad	NHS Board flu lead
“	Establish local arrangements for reference virology services for influenza	NHS Board flu lead
Control	Provide local support and guidance for use of antivirals including any local decisions about thresholds and usage in outbreaks	Director of Public Health (or their designated Pandemic Flu Coordinator)
Communications	Consider the components of a communications plan to be locally adopted in the event of a pandemic of influenza	NHS Board Communication Team
Learning	Conduct pandemic planning exercises in	NHS Board flu lead

Lessons	conjunction with other agencies & feedback lessons learned to NHS Board	
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### 3\* . Actions during the WHO Phase 3: Pandemic Alert Period

#### WHO PHASE 3: PANDEMIC ALERT PERIOD

##### Definition

Human infection(s) with a new subtype, but no new human-to-human spread, or at most rare instances of spread to a close contact

##### Key issue

Review likely diagnostic capability  
 Ensure enhanced surveillance activities are in place to detect imported human cases of the new virus subtype  
 Ensure Cfl Influenza Laboratory has resources to diagnose new virus subtype

#### 3.1 Health Protection Scotland

Function	Action	Implementer
Coordination	Formalise work programme for pandemic influenza under a project management framework	Director HPS
“	Consider creating subgroup to HPS ERG (Pandemic Response Group) as the nucleus for achieving the work facilitated by the Influenza Programme Manager	HPS ERG
“	Consider the implication of the phase change upon HPS and ensure that all appropriate actions have been taken or are in hand	Director HPS
“	Develop strong working relationships with SE Pandemic Flu Team and Health Protection Teams from HPA & the devolved administrations. Assist stakeholders and partners in resilience planning and exercising	HPS Flu lead, HPS ERG. HPS Communications Team
“	Ensure avian influenza database is supported within HPS and externally	HPS ERG
“	Convene <u>Pandemic Influenza Primary care Reporting (PIPER)</u> steering group from agencies involved in the collection, use & communication of primary care data	Chair HPS Influenza Lead
“	Convene group to address reporting of pandemic influenza from Secondary Care and Death Data	Chair HPS Influenza Lead
“	Monitor and coordinate HPS responses to international requests for briefings and expertise on pandemic influenza in conjunction with HPA	Clinical Director HPS & Human Resources
“	Liaise with Head of Influenza Laboratory Cfl to coordinate network of novel influenza subtype (currently H5N1) Polymerase Chain Reaction (PCR) diagnostics across Scotland	Influenza lead HPS with Clinical Virology Network & HPS microbiologist
“	Develop a coordinated and standardised local response to avian and pandemic influenza across Scotland.	HPS Zoonosis & HPS ERG
“	Ensure front line HPU staff have access to and are trained in the use of the avian influenza database	Influenza lead HPS
“	Ensure appropriate contribution from HPS to the production of HPA algorithms-	Influenza Lead HPS
“	Review capacity of individual HPUs to respond to	Quality Assurance

\* The section numbering moves directly to 3 in order to match WHO Phases

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	an avian influenza incident in poultry and /or wild birds	exercise & SCG's.
Surveillance	In collaboration with HPA and influenza surveillance teams in Wales & N. Ireland develop and maintain systems and templates for daily reporting of UK surveillance data and rehearse output	Influenza lead HPS
“	Monitor and disseminate international reports on avian influenza and human cases	Influenza lead HPS & Travel Health lead
“	In collaboration with HPA Cfl & the devolved administrations establish and maintain an avian influenza database	Influenza lead HPS
“	Develop and maintain capability for routine surveillance of secondary bacterial pathogens associated with influenza	HPS Influenza Lead, HPS Microbiologist & SMF in liaison with HPA Cfl
“	Establish programme for delivery of outputs from enhanced surveillance of influenza from primary care data – PIPER and the mechanism for sharing this surveillance information across NHS Scotland	Chair PIPER & HPS ERG with HPS CMT in discussion with SEHD
Investigation	Liaise with Cfl re influenza laboratory diagnostics and new developments in diagnostics as required	Influenza lead HPS & Scottish Virology Network
“	Liaise with Cfl re roll out validated diagnostic tests for novel influenza subtype. Ensure competence of laboratories by facilitating their quality control evaluation	Influenza lead HPS & Scottish Virology Network
“	Liaise with Cfl re their role for the UK in the development and maintenance of antiviral susceptibility testing of potential pandemic viruses	Influenza lead HPS
“	Liaise with HPA Cfl and where appropriate contribute to discussions with NIBSC, CEPR and DH over vaccine development plans	Influenza lead HPS, Immunisation Lead HPS
“	Assist HPA Cfl where appropriate re the development of robust framework and protocols for the management of repeat population-based serological surveys to determine the prevalence of antibody to the novel influenza subtype at different stages in the pandemic	Influenza lead HPS, Immunisation Lead HPS, HPS Consultant Microbiologist
“	Work with HPA Cfl to develop a system for the collection, analysis, interpretation, and dissemination of data on co-pathogens (bacteria) associated with novel influenza infection	Influenza lead HPS & HPS Consultant Microbiologist
“	Work with SEHD to lead HPS modelling for avian and pandemic influenza and ensure findings are disseminated across the Scotland as appropriate to national policy & that findings shared with colleagues in the devolved administrations	Influenza lead HPS & SEHD & STAMS
“	Maintain capability for surge capacity for novel influenza subtype (currently H5N1) PCR diagnostics for Regional H5 labs. Liaise with Cfl re arrangements for surge capacity for Veterinary Laboratory Agency (Weybridge)	Influenza lead HPS & Scottish Virology Network
“	Support STAMS modellers	Influenza lead HPS &

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		ERG
“	Ensure that nominated Scottish Clinical Virology Network representatives practice and maintain competence / capability for novel influenza subtype (currently H5N1) PCR diagnostics across nominated laboratories	Influenza lead HPS with Clinical Virology Network & HPS microbiologist
Risk Assessment	Prepare and disseminate algorithms for the management of returning travellers, contacts and persons involved in avian influenza incidents in wild birds or poultry for phase 3 and in preparation for phases 4 & 5	Influenza lead HPS & Travel Health Lead
“	Work with SEHD and their colleagues in DH to provide other guidance documents for avian and pandemic influenza as agreed	Influenza lead HPS & HPS Communications Group
Control	Establish and maintain HPU access to the local stock of antivirals and seasonal flu vaccine issued by SEHD for use in response to an avian influenza incident	HPS Influenza Lead in conjunction with SEHD pharmacy & vaccine supply group
“	Rehearse response to an avian influenza incident in poultry and wild birds including mobilisation and deployment of oseltamivir stock and seasonal influenza vaccine accessed through HPS on call system	HPS ERG
“	Rehearse response to confirmed human case of avian influenza in a returning traveller (Post Exposure Prophylaxis (PEP) arrangements)	HPS ERG
“	Support NHS Board PCD's/CHP's pandemic influenza planning	HPS Quality Assurance
“	Manage local returning traveller and avian influenza incidents consistently across the UK	HPS Influenza Lead in liaison with HPA Cfl
“	Report all returning traveller and avian influenza incidents to HPA Cfl pandemic influenza office)	HPS Influenza Lead
“	Support NHS Board Health Protection Teams in development of a local distribution strategy for antiviral medication based upon national guidance	HPS Influenza Lead in association with SEHD and HPS and SE EPT
“	Support NHS Board Health Protection Teams in identification of secure antiviral distribution points	HPS Influenza Lead in association with SEHD and HPS and SE EPT
“	Support NHS Board Health Protection Teams in developing local vaccination action plan based on national guidance	HPS Influenza Lead in association with SEHD and HPS and SE EPT
“	Support NHS Board Health Protection Teams by contributing to local pandemic influenza exercises	HPS Influenza Lead in association with SEHD and HPS and SE EPT
“	Support NHS Board Health Protection Teams by reviewing and advising on updating local HPU and regional avian and pandemic influenza plans	HPS Influenza Lead in association with SEHD and HPS and SE EPT
“	Maintain and rehearse opening of HPS emergency room & test communications systems	HPS ERG

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“	Develop and maintain capability for 24 / 7 provision of novel influenza subtype (currently H5N1) PCR diagnostics across nominated laboratories	Influenza lead HPS with Clinical Virology Network & HPS microbiologist
“	Liaise with Director HPA Respiratory Systemic Infection Laboratory re development and maintenance of capability for routine surveillance of secondary bacterial pathogens associated with influenza	Influenza lead HPS with HPS microbiologist and SMF
“	Maintain proficiency testing of laboratories for programmes above	HPS Microbiologist
Communications	Liaise with SEHD Pandemic Influenza Communications Team to establish HPS role in support of the raft of communication issues for this phase and plan for the provision of service for further escalation of the WHO phases	HPS Communications Team supported by input from the HPS ERG
“	In collaboration with HPA CfI produce and disseminate regular updates and briefings to HPUs on international and domestic situations and operational preparedness across Scotland	Influenza lead HPS in liaison with SE Pandemic Influenza Team
“	In liaison with SEHD ensure that national spokespeople are well briefed and media trained.	SEHD Communications in liaison with HPS ERG/CMT
“	Ensure key messages and Q&As are kept up to date and that these are shared with local HPUs	Influenza Lead HPS in liaison with HPS Communications Team
“	Prepare a business continuity plan which specifies duties for HPS communications team members	HPS Communications Team & HPS ERG
“	Liaise with SEHD Communications re plans to provide Communications resilience in the regions	HPS Communications Team in liaison with SEHD Communications
“	Establish sharing arrangements for information provided across secondary care and from Registrar Generals Office (deaths data)	HPS Influenza Lead with these other agencies
“	Establish HPS website resilience & plan for additional support that will be required	HPS ERG in liaison with HPS DSG, IT & KM Network
Lesson Learned	Share learning lessons from Pandemic Influenza exercises with Health Protection Staff	HPS ERG

### 3.2 NHS Board Health Protection Teams

Function	Action	Implementer
Coordination	Ensure front line HPU staff have access to and are trained in the use of the avian influenza database	HPU influenza lead
“	Ensure appropriate contribution to HPS to allow the production of HPA algorithms-	HPU influenza lead
“	Support NHS Board Primary Care Divisions in development of a local distribution strategy for antiviral medication based upon national guidance	NHS Board HPU Influenza Lead in liaison with HPS Influenza Team & SEHD
“	Support NHS Board Primary Care Divisions in identification of secure antiviral distribution points	NHS Board HPU Influenza Lead in liaison with HPS Influenza Lead in association with SEHD and HPS and SE EPT
“	Support NHS Board Primary Care Divisions in developing local vaccination action plan based on national guidance	NHS Board HPU Influenza Lead in liaison with HPS Influenza Lead in association with SEHD and HPS and SE EPT
“	Support and contribute to local pandemic influenza exercises	NHS Board HPU Influenza Lead in liaison with HPS Influenza Lead in association with SEHD and HPS and SE EPT
“	Review local HPU and regional Health protection avian and pandemic influenza plans	NHS Board HPU Influenza Lead in liaison with HPS Influenza Lead in association with SEHD and HPS and SE EPT
Surveillance	Review capacity of individual HPUs to respond to an avian influenza incident in poultry and /or wild birds	Quality Assurance exercise & SCG’.
“	Report all returning traveller and avian influenza incidents to HPS (HPS will in turn share this in a reciprocal arrangement with the HPA Cfl pandemic influenza office)	HPS Influenza Lead
Investigation	Practice and maintain competence / capability for novel influenza subtype currently H5N1 including Devolved Administrations’ nominated laboratories	Scottish Clinical Virology Network
“	Practice and maintain competence / capability for novel influenza subtype currently H5N1 including Devolved Administrations’ nominated laboratories	Scottish Clinical Virology Network (in liaison with HPS Microbiologist in liaison)

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Control	Develop and maintain capability for routine surveillance of secondary bacterial pathogens associated with influenza	HPU Influenza Lead, HPS Microbiologist & SMF in liaison with HPA CfI
“	Establish and maintain HPU access to the local stock of antivirals and seasonal flu vaccine issued by SEHD for use in response to an avian influenza incident	HPU Influenza Lead in liaison with HPS Influenza Lead/SEHD pharmacy & vaccine supply group
“	Rehearse response to an avian influenza incident in poultry and wild birds including mobilisation and deployment of oseltamivir stock and seasonal influenza vaccine accessed through HPS on call system	HPU Influenza Lead
“	Rehearse response to confirmed human case of avian influenza in a returning traveller (Post Exposure Prophylaxis (PEP) arrangements)	HPU Influenza Lead
“	Support Primary Care Divisions pandemic influenza planning	HPU Influenza Lead in liaison with HPS Quality Assurance
“	Manage local returning traveller and avian influenza incidents consistently across the UK	HPU Influenza Lead
“	Develop and adopt a coordinated and standardised local response to avian and pandemic influenza across Scotland.	HPU influenza lead
Communications	In liaison with SEHD ensure that regional/local spokespeople are well briefed and media trained.	Local communications team in liaison with SEHD & HPS communications teams

#### 4. Actions during the WHO Phase 4: Pandemic Alert Period

##### WHO PHASE 4: PANDEMIC ALERT PERIOD

###### Definition

Small cluster(s) with limited human-to-human transmission but spread is highly localised, suggesting that the virus is not well adapted to humans

###### Key issues

Surveillance capacity to detect as early as possible importation of cases  
 Distributed diagnostic capacity to detect new strain subtype  
 Effective communication to public and professionals

#### 4.1 Health Protection Scotland

Function	Action	Implementer
Coordination	Consider the need to further resource the HPS ERG to establish Support Management Subgroup (SMG) to assess potential impact of heightened alert state on HPS business continuity and resource options to deliver plan	Director HPS
“	Ensure support for avian influenza database is maintained	HPS CMT
“	Identify mechanisms for re-deployment of staff from ‘non-influenza’ areas and prepare staff for imminent deployment	SMG to HPS ERG in liaison with Human Resources in discussion & Director HPS
“	Agree priority UK & international contacts for HPS in a pandemic and identify non-essential UK & international activities to be curtailed/postponed	Director HPS
“	Consider need to activate HPS Emergency Response Plan & the special circumstances surrounding the HP Response Framework for Pandemic Influenza	HPS ERG
“	Place relief staff on stand-by for re deployment within HPS	Director of HPS
“	If decision taken to activate HPS Emergency Response Plan, lead and coordinate	HPS ERG
“	Prepare to provide staff to assist the operation of the Core Strategic Group	Head of Emergency Response
“	Place relief staff on stand-by to provide support to HPS Influenza team & for potential deployment to NHS Board Health Protection Teams	Director of HPS
“	Confirm arrangements for transport to Cfl of any suspected novel subtype for antiviral susceptibility testing and culture/sequencing	HPS Influenza and Scottish Virology Network Lead
“	Confirm arrangements for transport to Cfl of any suspected novel subtype for serological tests	HPS Influenza and Scottish Virology Network Lead
“	Liaise with HPA Cfl re the development of guidelines for use of rapid tests	HPS Influenza and Scottish Virology Network Lead
Surveillance	Ensure antimicrobial susceptibility data on	HPS IMT &

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	bacterial pneumonia pathogens is being received from NHS Board microbiology laboratories and analysed	Microbiologist
“	Update surveillance definition, guidelines and case management algorithms	HPS Influenza Lead
Investigation	Share modelling results with UK pandemic influenza groups, SE & DH for contingency and intervention planning	STAMS
“	Report possible clusters or outbreaks of influenza-like illness to NHS Board HP Units	HPS Influenza Lead
“	Undertake novel influenza subtype diagnostics to support the management of cases and clusters	Scottish Virology Network
“	In communities with travel/family-related contact with countries affected by the novel virus, implement enhanced virological sampling of routine respiratory specimens, regardless of timing in relation to normal “influenza season”	NHS Boards & Scottish Virology Network
Communications	In conjunction with SEHD Communications activate Communications Plan	HPS Communications Team in liaison with SEHD comms
“	Ensure that all national and regional HP spokespeople are well briefed	HPS Communications Team in liaison with SEHD comms & NHS Board comms
“	Keep key messages and Q&As updated	HPS Communications Team in liaison with SEHD comms

### 4.3 NHS Boards

Function	Action	Implementer
Coordination	Brief SCG/PICT and activate regional communications plans	DPH/HP Lead
“	Review staff capacity within the NHS Board/across regions	DPH/Regional Directors PH
“	Ensure antimicrobial susceptibility data on bacterial pneumonia pathogens is being transmitted to HPS	DPH/Regional Directors PH
“	Support PC divisions in compiling registers of at-risk or high priority groups for vaccination	HPU Leads
Surveillance	Health Protection Units (HPUs) report possible clusters or outbreaks of influenza-like illness to HPS, NHS and Strategic Coordinating Groups	HPU Leads
“	Support PC divisions to continue aggregate reporting methods for primary care (PIPER) according to national template	DPH/Primary Care Directors
“	Ensure case data are collected (with at least the minimum agreed dataset) and entered into the avian influenza database	HPU Leads
Control	Advise port health authorities based on port health algorithms	HPU Leads
“	Support the management of cases and clusters or outbreaks of influenza-like illness	HPU Leads

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“	Ensure local HPU pandemic plans are up-to-date in line with national HPS Framework	HP Leads
“	Support Acute NHS and Primary Care Divisions to ensure local preparedness	DPH
“	Assist NHS colleagues in developing framework for delivery of mass vaccination to target groups	HPU Leads
Communications	Communicate the national infection control guidelines and case management algorithms to local partners and support local training needs	HPU Leads

## 5. Actions during the WHO Phase 5: Pandemic Alert Period

### WHO PHASE 5: PANDEMIC ALERT PERIOD

#### Definition

Large cluster(s) but human-to-human spread still localised, suggesting that the virus is becoming increasingly better adapted to humans, but may not yet be fully transmissible (substantial pandemic risk)

#### Key planning assumptions for the UK

- The pandemic has commenced elsewhere and sustained pandemic activity in the UK is still several weeks away

#### Key issues

Enhanced surveillance capacity to detect first importation of infected cases  
 Distributed diagnostic capacity to detect new strain subtype  
 Efforts to support production of a vaccine and strategy for vaccination

### 5.1 Health Protection Scotland

	Action	Implementer
Coordinate	If not previously done, activate HPS Major Incident plan	Director HPS
“	HPS Emergency Response Group now formally convened as HPS Emergency Response Team as listed in this plan	Director HPS
“	Open HPS Emergency Operations Centre	Director HPS
“	If not already done so at WHO Phase 4 establish HPS ERG Management Support Team (MST) to assess potential impact of pandemic on HPS business continuity and resource options	Director HPS
“	Further enhance HPS ERG Pandemic Response Group from within and outwith membership of the HPS ERG	Director HPS
“	Plan curtailment or postponement of non-essential UK national and international activities	Director/ HPS Manager / Head of Human Resources
“	Review arrangement for the deployment of relief staff to HPS from other divisions of NSS	Director of HPS in liaison with NSS Head of Personnel and Divisional Directors
“	Ensure arrangements for 24 Opening of HPS to allow functioning of the HPS Emergency Operations Centre	HPS Manager in Liaison with Site Manager
“	Establish daily 'battle rhythm'	Director HPS
“	Establish routine for compiling information for parallel submission to SEHD & DH Web Portal to allow briefing of SEHD, Scottish Executive Coordinating Committee - SECC (Flu) & Cabinet Office Briefing Room (COBR) and other government departments	HPS ERG
“	Plan HPS input into SE and Strategic Coordinating Group (SCG) and SECC (Flu) and allocate these roles	HPS ERG in liaison with SEHD
“	Set up a liaison cell within SEHD	Director HPS

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“	Provide scientific input as required to SEHD & DH support Head of Pandemic Influenza Office to inform development of national policies on vaccine policy, use of neuraminidase inhibitors, and other public health and social interventions	HPS Influenza Lead
“	Identify mechanisms for re-deployment of staff from ‘non-influenza’ areas and prepare staff for imminent deployment	Director/ HPS Manager / Head of Human Resources
“	Consider implication of and repercussions of cancellation of all annual leave	Director/ HPS Manager / Head of Human Resources
“	Identify mechanisms for supporting staff required to work extended hours during phase 5 and 6	Director/ HPS Manager / Head of Human Resources
“	Prepare to divert IT resources to ensure that all systems are prioritised to support pandemic influenza response	HPS IT in liaison with NSS Shared Services Lead
“	Ensure that diagnostic reagents reach regional laboratory network in Scotland	HPS Microbiology Lead/Scottish Clinical Virology Network
Surveillance	Through HPA, WHO, ECDC and EISS, gather epidemiological, clinical and virological information about cases occurring in countries where transmission is already taking place	HPS Influenza Lead
“	Participate as appropriate in WHO/ECDC/EISS-led discussions and activities	HPS Influenza Lead
“	With NHS 24 and NHS Boards ensure that protocols are in place for structured enhanced surveillance using agreed algorithms	HPS Influenza Lead in liaison with PIPER stakeholders
Investigation	Review arrangements with Scottish Virology Network re provision of surge capacity for novel influenza virus diagnostics	HPS Microbiologist
“	With SEERAD (& their contacts with DEEFRA)/Health and Safety Executive (HSE)/Advisory Committee for Dangerous Pathogens (ACDP) and clinical virology network review and establish guidelines for handling virus in phases 5 and 6	HPS Influenza Lead/HPS zoonoses Lead/HPS Microbiology Lead/Scottish Clinical Virology Network
“	Update models of pandemic influenza with new parameter values if available	STAMS
“	Review strategy for diagnostic investigations in non-reference laboratories in phase 5 and 6	HPS Microbiology Lead/Scottish Clinical Virology Network
“	In collaboration with HPA Cfl review existing occupational health guidelines for laboratory staff including guidelines and SOPs for safe-handling and identification of novel virus in non-reference laboratory setting and ensure dissemination and implementation across LaRS laboratory network	HPS Microbiology Lead/Scottish Clinical Virology Network
“	If required participate in pre-pandemic serological survey	HPS Microbiology Lead/Scottish Clinical Virology Network/SNBTS –
“	Ensure antimicrobial susceptibility data on	HPS Microbiology

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	bacterial pneumonia pathogens is being analysed and reported	Lead/Scottish Clinical Virology Network
Control	Ensure all key HPS staff are offered vaccination with avian influenza vaccine if stipulated in national policy and criteria for vaccination clearly explained	HPS Occupational Health services
“	Review and update national guidance on infection control measures	HPS Influenza Lead in liaison with HPS Infection Control Team
“	Rehearse daily parallel reporting to SEHD & DH Pandemic Influenza Web Portal in DH Major Incident Coordination Centre for collation and onward reporting to SE SCG & Cabinet Office Civil Contingencies Committee	HPS Influenza Lead supported by HPS IMT
Communications	Disseminate information to HP services re outcome of collaboration of DH, Industry and others to support rapid development of new vaccine(s)	HPS Communications Lead
“	Communicate with service re production of diagnostic reagents for new strain by Cfl	HPS Microbiology Lead/Scottish Clinical Virology Network
“	Communicate information on status of robust serological tests for assessment and susceptibility and immunity to new virus being developed by HPA Cfl	HPS Microbiology Lead/Scottish Clinical Virology Network
“	Set up hotline facility with SEHD	HPS Communications Team in liaison with SEHD comms
“	Media handling of requests for information/experts for interview	HPS Communications Team in liaison with SEHD Communications
“	Provide advice on release of data	HPS Communications Team in liaison with SEHD Communications
“	Ensure the appropriateness of the advice on the HPS internet in the light of the emerging epidemiology and virology	HPS Influenza Lead in liaison with HPS Infection Control Team & HPA Cfl
“	Ensure spokespeople and NHS Board HPU Leads are up to date on latest information and statistics	HPS Communications Team in liaison with SEHD Communications
“	Determine timing of announcements with regional & NHS Board partners	HPS Communications Team in liaison with SEHD Communications
“	Share daily updates in teleconference with regional & NHS Board partners and stakeholders	HPS Communications Team in liaison with SEHD Communications
“	Share daily updates with HPS staff internally	HPS Communications

		Team
“	Discuss and agree with SEHD whether any new/amended public information material is required and provide expert information to HPA CfI as required	HPS Communications Team in liaison with HPS Infection Control Team

### 5.3 NHS Boards

Function	Action	Implementer
Coordination	Support RDsPH in the Strategic Coordinating Group	NHS Board Directors/HP Leads
“	Local HPUs to support local Influenza Pandemic Control Teams/Committees (or equivalent bodies)	HPU Leads
“	Support PC Divisions and Acute Services to contact all primary care physicians, emergency departments, acute receiving and infectious diseases units to ensure surveillance and management guidance is in place	HPU Leads
“	Update all staff contact information to facilitate rapid communication and deployment	HPU Leads/Human Resources
“	Support PC Divisions in coordination of vaccination (if supplies are available)	DPH/HPU Leads
Surveillance	Ensure case data are entered into the avian influenza database	DPH/HPU Directors
“	Implement enhanced surveillance and case investigation procedures as agreed with HPS	DPH/HPU Directors
“	Manage and notify all local pre-pandemic influenza incidents to HPS as they occur	DPH/HPU Directors
Risk assessment	<i>Compile registers of at-risk or high priority groups for vaccination - support NHS Board Primary Care divisions</i>	DPH/HPU leads to support NHS Board Primary Care divisions
Control	<i>Develop local vaccination action plan based on national guidance - support NHS Board Primary Care divisions</i>	
“	<i>Identify vaccination teams and delivery points - support NHS Board Primary Care divisions</i>	
“	<i>Develop local distribution strategy for antiviral medication - Work with NHS Board Primary Care divisions</i>	
“	<i>Identify secure antiviral distribution points - Work with NHS Board Primary Care divisions</i>	
“	<i>Ensure local preparedness in healthcare and social care- Work with NHS Board secondary care divisions</i>	
“	<i>Ensure Port Health information on travel advice being displayed/distributed in appropriate locations as it becomes available – in liaison with Local Authority and Airport/Port staff</i>	

## 6.1<sup>†</sup>. Actions during the WHO Phase 6: Pandemic Period, UK Alert Level 1

### PHASE 6: PANDEMIC PERIOD, UK ALERT LEVEL 1

#### Definition

Pandemic phase: increased and sustained transmission in the general population

#### Alert Level 1

Virus/cases only outside the UK

#### Key planning assumption

During this phase the first wave of the pandemic takes its course in the UK from first detection of domestically acquired cases to maximum morbidity and mortality  
Vaccine may become available but initial lots may need to be rationed or prioritised

#### Key issues

- Prompt detection through intensive surveillance
- Prompt management of initial cases to slow spread
- Measures to reduce transmission (antivirals for prophylaxis and treatment)
- Protection of the population through vaccination
- Rapid detection of any changes in the virus
- Reducing and modifying surveillance activity as pandemic peaks

### 6.1.1 Health Protection Scotland

Function	Action	Implementer
Coordination	Deploy relief staff as required to HPS ERT	Director of HPS
“	Consider establishing a forward look group to identify potential future threats and risks	Director of HPS/HPS ER Lead
“	Ensure surge capacity arrangements are in place for novel influenza subtype (currently H5) diagnostics	Director of HPS/ HPS Microbiologist
“	Provide staff to support, and deploy relief staff to, HPS and NHS Boards	Director of HPS
“	Finalise and publish HPS pandemic response organogram including designation of key staff alternates	Director of HPS
“	Implement Pandemic Influenza Command and Control arrangements	Director of HPS
“	Finalise policy and issue prophylactic antiviral drugs via occupational health to selected HPS laboratory staff in line with COSHH other regulations	Director of HPS
“	Liaise with government and other agencies to assess response options	Director of HPS/HPS Influenza Lead
“	Review and update briefing requirements of SE SCG & COBR and other government departments	Director of HPS/HPS Influenza Lead
“	Coordinate HPS tactical responses through daily teleconference and Situation Reports from HPA and NHS Boards	Director of HPS/HPS Influenza Lead
“	If not already done so activate HPS Emergency Response Room	Director HPS
“	Establish a daily ‘battle rhythm’ for meetings and information flows to meet HPS, HPA and	Director of HPS/HPS Influenza Lead

<sup>†</sup> In WHO Phase 6 , the second digit of the section numbering denotes the UK Alert Level

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	government needs	
“	Support HPA and PFO in international liaison	Director of HPS/Human Resources Lead
Surveillance	Begin UK wide surveillance and daily reporting ‘battle rhythm’ as specified by Civil Contingencies Secretariat (CCS) Daily Situation Cell Report (copied to SEHD/SE SCG)	Director of HPS/HPS Influenza Lead
“	Rapidly disseminate information about emerging clinical and virological surveillance data.	Director of HPS/HPS Influenza Lead/HPS Microbiologist
“	Develop enhanced surveillance in special groups if required	Director of HPS/HPS Influenza Lead
Risk Assessment	If requested to do so: Support SEHD/DH/HPA in setting guidelines for the use of antiviral and vaccines	STAMS/ Director of HPS/HPS Influenza Lead/HPS Immunisation Lead
“	Ensure contingency arrangements in place for assisting NHS Boards in risk assessment, investigation and support of individual incidents	Director of HPS/HPS Influenza Lead
Investigation	Unless available locally in Scotland test send representative sample of all influenza specimens for new virus to HPA Cfl	Director of HPS/HPS Influenza Lead/HPS Microbiologist
“	Update models of pandemic influenza with new parameter values if available	STAMS
“	Ensure laboratories have appropriate tests and testing capability in place to deal with first UK cases	HPS Microbiologist in liaison with Scottish Clinical Virology Network
“	Provide rapid diagnostic service for first suspected UK cases	Scottish Clinical Virology Network
Communications	Horizon scan to prepare for new news angles	HPS Communications Team
“	Review regional media coverage daily and respond/rebut as necessary	SEHD Communications in Liaison with HPS Communications Team
“	Media handling of NHS Board, Strategic Coordinating Group requests for information/experts	SEHD Communications in Liaison with HPS Communications
“	Share daily updates in teleconference with regional partners and stakeholders	HPS Influenza Lead
“	Ensure national and regional spokespeople and HPUs are up to date on latest information and stats	SEHD Communications in Liaison with HPS Communications
“	Media handling of national requests for information/experts	SEHD Communications in Liaison with HPS Communications
“	Take part in daily national CMO briefings and provide experts spokespeople as required	HPS SE Liaison

“	Review national media coverage daily and respond/rebut as necessary (in liaison with Department of Health)	SEHD Communications in Liaison with HPS Communications
“	Share daily updates in teleconference with Regional Communications Managers	SEHD Communications in Liaison with HPS Communications

### 6.1.3 NHS Boards

	Action	Implementer
Coordination	Support local civil emergency response arrangements	DPH
“	<i>Co-ordinate distribution of antivirals to high-priority groups</i> - Support NHS Board Primary Care divisions (as supplies are allocated to Scotland by DH	
“	<i>Coordinate vaccination</i> - Support NHS Board Primary Care divisions (as supplies are allocated to Scotland by DH).	
Surveillance	Implement enhanced surveillance and case investigation procedures as per HPA/HPS guidance	DPH/HPU Leads
“	Ensure case data are entered into the avian influenza database/ First Few Hundreds Database (FF100's) for as long as reasonably possible	DPH/HPU Leads
“	If not already done so open NHS Board Emergency Operations Centres	DPH/HPU Leads
Risk Assessment	Participate in daily teleconference updates	DPH/HPU Leads
Control	<i>Co-ordinate distribution of antivirals to high-priority groups</i> - Support NHS Board Primary Care divisions (as supplies are allocated to Scotland by DH	DPH/HPU Leads
“	<i>Coordinate vaccination</i> - Support NHS Board Primary Care divisions (as supplies are allocated to Scotland by DH).	DPH/HPU Leads
Communications	In liaison with SE, HPS, and SCG communications teams coordinate local distribution of information for the NHS and for general public	DPH/HPU Leads

## 6.2 Actions during the WHO Phase 6: Pandemic Period, UK Alert Level 2

### PHASE 6: PANDEMIC PERIOD, UK ALERT LEVEL 2

#### Definition

Pandemic phase: increased and sustained transmission in the general population

Alert Level 2

Virus isolated in the UK

#### 6.2.1 Health Protection Scotland

Function	Action	Implementer
Coordination	Deploy relief staff as required	Director of HPS
“	Ensure surge capacity for novel influenza subtype (currently H5) diagnostics	HPS Microbiologist/Scottish Clinical Virology Network
“	Provide staff to support, and deploy relief staff, to HPS and NHS Boards as required	Director of HPS
“	Ensure administration and support arrangements are in place so that relief staff can be deployed seamlessly across HPS from NSS to support pandemic response functions in different HPS locations (currently Clifton and Cadogan House)	Director of HPS
“	Ensure logistical arrangements are in place for overnight housing of staff temporarily required to mount a 24/7 response	HPS Manager/Head of Human Resources
“	Support HPA & PFO in international liaison	Director of HPS
“	If not already done so Invoke major incident plan for site and consider staff redeployment	Director of HPS
Surveillance	Review information on copathogens in influenza cases (community and hospital) and report	HPS Influenza Lead in liaison with HPS Microbiologist
Investigation	Continue to provide clinical samples to allow detailed antigenic and genetic characterisation by HPA Cfl for all novel UK influenza viruses for preparation of candidate vaccine strains	HPS Microbiologist in liaison with Scottish Clinical Virology Network
“	Facilitate distribution of UK specific serological and diagnostic reagents when available	HPS Microbiologist in liaison with Scottish Clinical Virology Network
“	Continue to provide clinical samples to allow antiviral susceptibility of virus isolates, including any treatment failures	HPS Microbiologist in liaison with Scottish Clinical Virology Network
“	Assist modellers in the analyse of the First Few 100 database (derived from the AI database but now changing name to reflect that we now have a pandemic strain) to estimate key parameters	STAMS in liaison with HPA Head of Modelling and Economics Unit
Communications	Horizon scan to prepare for new news angles	HPS Communications Team
“	Media handling of requests for spokespeople	SEHD Communications Team in liaison with

		HPS Communications Team
“	Review regional media coverage daily and respond/rebut as necessary	SEHD Comms in liaison with HPS Comms
“	Share daily updates in teleconference with local and regional partners and stakeholders	HPS Influenza Lead
“	Ensure national, regional and local spokespeople are up to date on latest information and stats	SEHD Communications in liaison with HPS Communications Team
“	Media handling of UK national requests for information/experts	Cfl Press Office in liaison with SEHD Communications & HPS Communications Team
“	Take part in daily national CMO briefings and provide experts spokespeople as required	SEHD Communications in liaison with HPS Communications Team
“	Review national media coverage daily and respond/rebut as necessary (in liaison with Department of Health)	Cfl Press Office in liaison with SEHD Communications & HPS Communications Team
“	Share daily updates in teleconference with Regional Communications Managers	SEHD Communications in liaison with HPS Communications Team

## 6.2.2 NHS Boards

Function	Action	Implementer
Coordination	Support NHS local and regional response arrangements	DPH/HPU Leads
“	Provide specialist health protection advice to civil emergency responders at regional and local level through Strategic Response Groups and Local Pandemic Influenza control teams.	DPH/HPU Leads
“	Support PC divisions to coordinate antiviral distribution as supplies are allocated by SEHD/DH	DPH/HPU Leads
“	Collate local reports of aggregate influenza activity	HPU Leads
“	Ensure details of new cases are entered into avian influenza database	HPU Leads
“	<i>Ensure all key HP staff are vaccinated - if vaccine available and if stipulated in national policy and criteria for vaccination clearly explained</i>	HPU Leads
“	<i>Ensure all key HP staff are offered antiviral prophylaxis - if stipulated in national policy.</i>	HPU Leads
“	<i>Coordination of the collation and dissemination of results of investigation from suspect cases – HPS in cooperation with the NHS Boards</i>	HPU Leads

### 6.3. Actions during the WHO Phase 6: Pandemic Period, UK Alert Levels 3 & 4

#### PHASE 6: PANDEMIC PERIOD, UK ALERT LEVEL 3 and 4

**Definition**

Pandemic phase: increased and sustained transmission in the general population

**Alert Level 3**

Outbreak(s) in the UK

**Alert Level 4**

Widespread pandemic activity in the UK

**Key issues**

- Prompt management of initial cases to preserve life
- Protection of the population through vaccination
- Reducing and modifying surveillance activity as pandemic peaks (including possible change in emphasis to counting the dead)

#### 6.3.1 Health Protection Scotland

Function	Action	Implementer
Coordination	Continue to review and coordinate resilience measures e.g. staff deployment	Director of HPS
“	Work with Government to ensure that appropriate data and advice is supplied and to act as the conduit for downward tasking	Director of HPS
“	Through daily teleconference and Situation Reports <i>coordinate HPS tactical and operational responses</i>	
Surveillance	Shift in emphasis – concentration on death data rather than case recording and investigation. Because of scale of occurrence, reduce or cease investigation and documentation of individual outbreaks, including efficacy of any appropriate control measures and clinical and microbiological results.	GRO / ISD
“	Review information on co-pathogens in influenza cases (community and hospital)	HPS microbiology
“	In collaboration with NHS Boards consider closure of national avian influenza database and substitution of aggregate reporting	HPS Influenza Lead in liaison with NHS Boards & SEHD
“	Monitor systematically collected and anecdotal reports of influenza activity across the country and in the population	HPS Influenza Lead
“	Continue to collate and interpret information from established surveillance systems and ad hoc sources to provide daily Situation Cell Report to support the work of other agencies and the SE SCG & Civil Contingencies Committee (as convened)	HPS Influenza Lead
“	Continue surveillance of secondary bacterial infections to inform treatment guidelines	HPS Microbiologist in liaison with Scottish Clinical Virology Network
“	Continue to provide a representative number of samples to the HPA Cfl to allow detailed antigenic	HPS Microbiologist in liaison with Scottish

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	and genetic characterisation for all UK influenza novel viruses for preparation of candidate vaccine strains	Clinical Virology Network
“	Facilitate distribution of UK specific serological and diagnostic reagents as they become available	HPS Microbiologist in liaison with Scottish Clinical Virology Network
“	Monitor antiviral susceptibility of virus isolates, including treatment failures and compare data with other international sources	HPS Microbiologist in liaison with Scottish Clinical Virology Network
“	Reduce virological surveillance when pandemic reaches peak to avoid overwhelming laboratories.	HPS Microbiologist in liaison with Scottish Clinical Virology Network
Investigation	Because of scale of occurrence, reduce or cease investigation and documentation of individual outbreaks, including efficacy of any appropriate control measures and clinical and microbiological results. Development of UK specific serological and diagnostic reagents no longer applies: assume completed during Alert Level 3.	
“	Monitor antigenic drift in novel strain, antiviral resistance or emergence of other variants.	HPS Microbiologist in liaison with Scottish Clinical Virology Network
“	Produce estimates of epidemic progress and forecasts by fitting real-time models to available surveillance data.	STAMS in liaison with HPA Head of Modelling and Economics Unit
Risk assessment	<i>Concentration on deaths and factors affecting outcome</i>	GRO /ISD,
Control	Because of scale of occurrence, reduce or cease investigation and documentation of individual outbreaks, including efficacy of any appropriate control measures and clinical and microbiological results.	HPS Flu lead in liaison with NHS Board HP Teams
“	In collaboration with NHS Boards investigate and document outbreaks including efficacy of any appropriate control measures and clinical and microbiological results	HPS Influenza Lead in liaison with SEHD and STAMS
Communications	Horizon scan to prepare for new news angles	SEHD Communications, HPS Communications Team
“	Media handing of requests for local and regional spokespeople	SEHD Communications & HPS Communications Team
“	Review regional media coverage daily and respond/rebut as necessary	SEHD Communications & HPS Communications Team
“	Share daily updates in teleconference with	SEHD

	regional partners and stakeholders	Communications
“	Ensure local and regional spokespeople and HPUs are up to date on latest information and stats	SEHD Communications
“	Media handling of national requests for information/experts	SEHD Communications & HPS Communications Team
“	Take part in daily national CMO briefings and provide experts spokespeople as required	SEHD Communications & HPS Communications Team
“	Review national media coverage daily and respond/rebut as necessary (in liaison with Department of Health)	SEHD Communications & HPS Communications Team
“	Share daily updates in teleconference with Regional Communications Managers	SEHD Communications & HPS Communications Team

### 6.3.2 NHS Boards

Functions	Action	Implementer
Coordination	Support aggregate reporting arrangements	DPH/HPU Leads
Control	Support investigation and response to outbreaks and assess the efficacy of control measures	DPH/HPU Leads
“	Continue work through/with local Influenza Pandemic Control Committees / Regional Teams	DPH/HPU Leads
“	Support PC divisions in distribution of antivirals in accordance with national policy	DPH/HPU Leads
“	Ensure continuity of data-flows on antimicrobial susceptibility of bacterial pneumonia pathogens from diagnostic laboratories to HPS	HPS Microbiologist in liaison with SMF
“	Collate local aggregate reports of influenza cases in primary care	HPS Influenza Lead
Communications	Liaise closely with SE, HPS and SCG's re information for the NHS and general public	HPS Communications Lead

## 6.4 Actions during the WHO Phase 6: End of the First Pandemic Wave

### PHASE 6: END OF FIRST PANDEMIC WAVE

#### Definition

End of first pandemic wave; return to inter-pandemic period

#### Key planning assumption

Phase 6 end of first pandemic wave actions in UK begin when circulation of virus reduces to low levels in the UK. Larger quantities of vaccine are becoming available for the first time

#### Key issues

Evaluation and assessment  
Preparation for second wave including orderly vaccination of remaining susceptible groups

### 6.4.1 Health Protection Scotland

Function	Action	Implementer
Coordination	Maintain the forward look group to identify issues relating to the recovery phase	Director HPS
“	Consider deployment of HPS resources/expertise to support countries still affected	Director of HPS in liaison with HPA
“	Ensure adequate down time and recovery for affected HPS staff	HPS Human Resources
“	Ensure restocking of laboratories	HPS Microbiologist in liaison with Scottish Microbiology Forum & Clinical Virology Network
Surveillance	Monitor uptake of vaccine as supply meets demand and mass vaccination gets underway	HPS Influenza Lead
Investigation	If appropriate perform post-wave serological survey to determine age specific patterns of residual susceptibility and age-specific attack rates	HPS Influenza Lead / HPS Immunisation Lead in liaison with HPS CfI
“	Monitor progress of current R&D and the need for further activities	HPS Influenza Lead
“	Where possible consider how to foster international research collaborations on pandemic influenza	HPS Influenza Lead with HPA and devolved's HP Teams
Control	First tranche of pandemic flu vaccine may become available for NHS across UK - arrange for HPS occupational health service to vaccinate all staff in line with UK vaccination guidance	Director HPS
Communications	Review media coverage	HPS Communications Team in liaison with SEHD Communications
“	Work with SE Health Department to devise and refine any new messages required	HPS Communications Team in liaison with SEHD Communications with

“	Prepare any new public information/guidance based on latest information available from experts at HPS and HPA Cfl	HPA Cfl HPS Communications Team in liaison with SEHD Communications with HPA Cfl
Lessons learned	Evaluate and refine regional Communications strategy	HPS Communications Team in liaison with SEHD Communications with NHS Board Communications Managers
“	Review activities and outcomes with partners and stakeholders in the regions	HPS Communications Team in liaison with SEHD Communications with NHS Board Communications Managers
“	Evaluate and refine UK national Communications strategy	HPS Communications Team in liaison with SEHD Communications with HPA Cfl
“	Carry out internal debrief to contribute to the overall HPS & HPA debrief reports	Director HPS
“	Carry out internal debrief to contribute to the HPS/SEHD Pandemic Influenza debrief report	Director of HPS/HPS ERT in liaison with SEHD
“	SE SCG will likely conduct a debriefing of all agencies involved in the pandemic of their experiences and their interfaces with government. This will allow an external strategic overview of the effectiveness of the HPS plans, identify lessons to be learned and propose to the Director HPS revision of plans as appropriate for the possible second wave	Director HPS
“	Carry out internal debrief to contribute to the overall HPS debrief report	SMF
“	Assist NHS Boards by providing guidance on a uniform format for the review of their experience of the pandemic – adaptation of Quality Assurance tool currently being compiled by HPS	HPS Influenza Lead in liaison with SEHD
“	In joint conference with HPA and Health Protection Teams from devolved administrations evaluate national experience in comparison with other countries through international liaison	HPS Influenza Lead with HPA and devolved’s HP Teams

### 6.4.3 NHS Boards

Function	Action	Implementer
Control	First tranche of pandemic flu vaccine may become available for NHS across UK - arrange for	DPH

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	Occupational Health Service to vaccinate all staff in line with UK vaccination guidance	
“	Support PC divisions in implementing SEHD/DH vaccination policy	DPH
Lesson Learned	Carry out internal debrief to contribute to the overall Health Protection debrief report	DPH
“	Review actions taken and adapt existing plans in the light of lessons learned	DPH in liaison with HP Lead & Strategic Coordinating Group Lead

## PHASE 4: SECOND OR SUBSEQUENT WAVES

### Definition

Based on past experience, a second wave of outbreaks caused by the new virus may be expected to occur in many countries

### 6.5 Actions during the WHO Phase 6: Second or Subsequent Waves

#### PHASE 6: SECOND OR SUBSEQUENT WAVES

##### Definition

Based on past experience, a second wave of outbreaks caused by the new virus may be expected to occur in many countries

##### Key planning assumptions

The second wave occurs within 3 to 9 months of the initial epidemic in the winter following the first wave

Majority of population are, by now, vaccinated

The virus may have evolved

Impact may be equal or worse than first phase

##### Key issues

Early detection of second wave

**Reactivate activity to that of WHO Phase 6 of HPS Health Protection Framework at all levels as needed**

### 6.5.1 Health Protection Scotland

Function	Action	Implementer
Coordination	Reconvene the HPS PWG, HPS Strategic Core Group & reopen the Emergency Room as needed	Director of HPS
“	Reactivate HPS actions at UK Alert Levels 2-4 as appropriate across all centres and LaRS	Director of HPS
Surveillance	Maintain national surveillance mechanisms for evidence of resurgence in activity	HPS Influenza Lead
“	Continue monitoring global impact and spread of virus	HPS Influenza Lead
“	Monitor any antigenic drift in the virus and assess potential significance	HPS Influenza Lead in liaison with HPS microbiologist & Scottish Clinical Virology Network & HPA CfI
Investigation	Forecast epidemic by fitting real-time models to available surveillance data	STAMS in liaison with other UK modelling groups
Communications	Evaluate media coverage and Communications strategies	HPS Communications Team in liaison with SEHD Communications with HPA CfI
“	Identify lessons learned and share with stakeholders and partner organisations	HPS Communications Team in liaison with SEHD

		Communications with HPA CfI
“	Make any required adjustments to Communications strategies in light of experience and evaluation	HPS Communications Team in liaison with SEHD Communications with HPA CfI
“	Review actions taken and adapt existing plans in the light of lessons learned	Director of HPS
“	Review actions taken and adapt existing plans in the light of lessons learned	Director of HPS
“	Review international liaison and identify lessons learned	HPS Influenza Lead

### 6.5.3 NHS Boards

Function	Action	Implementer
Surveillance	Maintain local surveillance mechanisms for evidence of resurgence in activity	HPU Leads
Lessons Learned	Review actions taken and adapt existing plans in the light of lessons learned	HPU Leads

## 7. Actions during the Post-Pandemic Period

### POST-PANDEMIC PERIOD

#### Definition

WHO will announce when the pandemic period is over. In the UK the pandemic will be deemed to have ceased when the epidemiological indices have returned to background levels

#### Key planning assumptions

- This or a similar virus is likely to remain in circulation
- It may take months or even several years for some national services to recover

#### Key issues

Assessment and evaluation

### 7.1 Health Protection Scotland

Function	Action	Implementer
Coordination	Ensure adequate down time and recovery for all HPS staff	Director HPS in liaison with Human Resource
“	Support re-activation of HPS UK National and International activities which had been affected by the pandemic	Director of HPS
Communications	Evaluate the impact of the pandemic in terms of public reception of risk, infection control and public health issues	In liaison with HPA and SEHD & HPS Communications Team
Lessons learned	Stocktake with DPHs and partners and stakeholders on lessons identified, any revisions to regional Communications strategy and agree way forward	HPS Communications Team in Liaison with SEHD comms and coordinated UK communication review
“	Stocktake with SE Health Department on lessons identified, any revisions to Communications strategies and agree way forward	HPS Communications Team in Liaison with SEHD Comms to coordinate UK comms review
“	Conduct a National HP evaluation of lessons learned	Director of HPS
“	Assess the effectiveness of the UK Pandemic Emergency Response Framework and HP Framework for a Pandemic of Influenza	Director of HPS in liaison with SEHD
“	Evaluate the impact of the pandemic. Identify lessons learned and disseminate new scientific learning through appropriate channels	Director of HPS
“	Take stock of the pandemic's impact on the HPS and implement actions to return HPS to business as usual	Director of HPS
“	Assessment of overall health impact of pandemic	Director of HPS in liaison with SEHD

### 7.3 NHS Boards

	Action	Implementer
Lessons Learned	Evaluate the impact of the pandemic. Identify lessons learned and disseminate new scientific learning through appropriate channels	DPH's with HP Leads