WHO guidelines for global surveillance of influenza A/H5

Rationale

There is currently a widespread epidemic in Asia of highly pathogenic avian influenza (HPAI), caused by influenza A (H5N1) in animal populations, particularly chickens, that poses a considerable human public health risk. Not only can these viruses infect humans, causing severe disease with high mortality, but there is also potential for them to adapt, or recombine with other influenza viruses, and give rise to a pandemic viral strain.

For close global monitoring of the situation and coordination of the global response, the World Health Organization (WHO) is recommending enhanced surveillance for influenza A/H5 until further notice. As the epidemiological situation evolves, WHO will review these surveillance guidelines and update them as necessary.

Objectives

General objectives

- To monitor the spread of influenza A/H5 viruses in human and animal populations in order to assess the global trend of the disease, the public health risk it poses, and its pandemic potential, and to trigger public health actions for pandemic preparedness as specified in the *Influenza pandemic preparedness plan* (document WHO/CDS/CSR/EDC/99.1, available at http://www.who.int/csr/resources/publications/influenza/en/whocdscsredc991.pdf)

Specific objectives (see sections 1–5 below)

1. To monitor the global occurrence of influenza A/H5 viral infection in humans.
2. To identify and characterize any emergent influenza strain so as to inform control strategies.
3. To monitor changes in transmission patterns of influenza A/H5 viruses and to detect potential human-to-human transmission of influenza A/H5 viruses;
4. To monitor unusual morbidity and mortality due to acute respiratory illness.
5. To contribute to the monitoring of outbreaks of HPAI in animal populations.

Tools to assist in the implementation of surveillance of influenza A/H5 viral infection

For clinical management and reporting within a country or territory, case definitions with a hierarchy of case categories will need to be developed according to the epidemiological situation. Annex 1 provides the case definitions implemented in Viet Nam, where influenza A/H5 viruses have been identified as a cause of illness in human and animal populations. In general, countries or territories with reported HPAI outbreaks in animal populations need to adopt more sensitive case definitions to initiate laboratory testing than countries and territories without reported HPAI outbreaks. Depending on the scope of HPAI outbreaks in animal populations and the physical size of the country, the case definitions for local clinical and public health management may vary. However, the definition of a confirmed case of influenza A/H5 should be standard at all levels (see *Confirmed case definition* below).

The case classification scheme included in these tools is based on that implemented in Viet Nam. Member States will need to adapt these tools to make them compatible with their own case classification scheme.

Tools provided in the annexes listed below are designed to assist Member States in the collection and consolidation of data at all levels and in reporting to WHO.

Annex 1: *Case definitions used in Viet Nam*
Annex 2: *Template for daily country summary*
Annex 3: *Template for line-listing*
Annex 4: *Data dictionary for line-listing*
Annex 5: *Template for case report form*
Annex 6: WHO reference laboratories for diagnosis of influenza A/H5 infection
Annex 7: Contact details for reporting to WHO

The electronic version of the annexes may be obtained from the relevant WHO regional office (see Annex 7).

Please see ***Interim WHO guidelines on clinical management of humans infected by influenza A (H5N1)*** for further information regarding case management.
(Available at http://www.who.int/csr/disease/avian_influenza/guidelines/en/)

1. Monitoring the global occurrence of influenza A/H5 viral infection in humans

Rationale

The implementation of surveillance of influenza A/H5 viral infection in humans is crucial to:

- provide health authorities with up-to-date information on the occurrence of human influenza A/H5 viral infections;
- identify areas with influenza A/H5 activity in order to target further surveillance and control activities;
- facilitate the coordination of international research efforts in order to prepare recommendations on the development of pandemic influenza vaccines.

Events under surveillance

For the purposes of global surveillance, Member States are requested to report to WHO all laboratory-confirmed cases of influenza A/H5 fulfilling the case definition below, according to the procedures detailed in the section *Reporting and dissemination of information* below. Member States are also requested to report to WHO information about cases in all cases categories as detailed below in Section 3, *Monitoring changes in transmission patterns and detecting potential human-to-human transmission of influenza A/H5 viruses*.

A. For countries and territories where influenza A/H5 viruses **have** been identified as a cause of illness in human or animal populations since 1 October 2003, the decision on whether to test for influenza A/H5 viruses should be the result of a case-based risk assessment that considers the following factors:
   - clinical presentation, including death due to unexplained acute respiratory illness;
   - scope of reported HPAI outbreaks in the local animal populations;
   - during the 7 days before the onset of symptoms, contact (within touching or speaking distance) with a confirmed human case of influenza A/H5 infection;
   - during the 7 days before the onset of symptoms, contact (within touching or speaking distance) with a person with an unexplained acute respiratory illness that later resulted in death;
   - positive laboratory result for influenza A.

   Note: Laboratory investigations for influenza A/H5 may also be undertaken in the context of targeted epidemiological studies. Laboratory-confirmed cases identified in these circumstances should also be reported, regardless of the clinical presentation.

B. For countries and territories where influenza A/H5 viruses **have not** been identified as a cause of illness in human or animal populations since 1 October 2003, the decision on whether to test for influenza A/H5 viruses should be the result of a risk assessment that considers both geographical proximity to countries or territories where HPAI outbreaks are reported in animal populations and the following case-based factors:
   - clinical presentation, including death due to unexplained acute respiratory illness ;
   - occupational exposure;[1]
   - living in an area in which there are rumours of deaths of domestic fowl;[2]
   - history of travel, during the 7 days before the onset of symptoms, to a country or territory with reported HPAI outbreaks due to influenza A (H5N1) in the animal populations **AND** one or more of the following:
     - contact (within 1 metre) with live or dead domestic fowl, wild birds, or swine in any setting;
     - exposure to settings in which domestic fowl or swine were or had been confined in the previous 6 weeks;
     - contact (within touching or speaking distance) with a confirmed human case of influenza A/H5 infection;
     - contact (within touching or speaking distance) with a person with an unexplained acute respiratory illness that later resulted in death;
     - positive laboratory result for influenza A.

Confirmed case definition

A confirmed case of influenza A/H5 infection is an individual, alive or deceased, in whom laboratory testing demonstrates **one or more** of the following:
- positive viral culture for influenza A/H5;
- positive polymerase chain reaction (PCR) for influenza A/H5;
- positive immunofluorescence antibody (IFA) test for H5 antigen using H5 monoclonal antibodies;
- 4-fold rise in H5-specific antibody titre in paired serum samples.

The laboratory tests for the diagnosis of influenza A/H5 infection included in the case definition are considered the standard for the identification of these viruses.

WHO recommends that laboratory results for influenza A/H5 are corroborated by a national influenza centre or other national reference laboratory. Any sample or isolate that is a non-typable influenza A (i.e. non-H3 or non-H1 subtype) should be sent immediately to a WHO collaborating centre on influenza or other WHO-recommended reference laboratory (see Annex 6*: WHO reference laboratories for diagnosis of influenza A/H5 infection*).

WHO also recommends that the first positive laboratory identification of influenza A/H5 virus in humans in any country or territory be confirmed by one of the WHO reference laboratories for diagnosis of influenza A/H5 infection (see Annex 6).

In addition, and until further notice, WHO requests that all human influenza A/H5 virus isolates or samples be sent to one of the WHO reference laboratories for diagnosis of influenza A/H5 infection (see Annex 6).

[1] At-risk occupations such as a domestic fowl or swine farm worker, domestic fowl processing plant worker, domestic fowl culler (catching, bagging, or transporting birds, disposing of dead birds), worker in live animal market, chef working with live or recently killed domestic fowl, dealer or trader in pet birds, worker in a laboratory where specimens are tested for influenza A/H5 viruses, health care worker.

[2] Domestic fowl are birds that are commonly reared for their flesh, eggs, or feathers and are kept in a yard or similar enclosure, including chickens, ducks, geese, turkeys, guinea-fowl.

Countries or territories that lack the capacity to perform laboratory investigations of influenza-like illness (ILI) or acute respiratory illness are requested to consult the relevant WHO country office, or WHO regional office, for advice and technical assistance, and to inform the WHO country office, or WHO regional office, if specimens are being sent internationally for identification or further characterization.

Reporting and dissemination of information

WHO requests that Member States immediately report the first identified individual fulfilling the confirmed case definition to the relevant WHO country office, WHO regional office, and WHO headquarters by e-mail or fax (see Annex 7: *Contact details for reporting to WHO).*

Once the first case has been identified, WHO requests that an aggregate report of confirmed cases is sent daily to the relevant WHO country office, WHO regional office, and WHO headquarters (see Annex 2: *Template for daily country summary).* Members States are requested to report summary case data daily by e-mail or fax or through the secure password-protected WHO Global Atlas web site. Any Member State wishing to report daily summary data via the WHO Global Atlas web site should contact outbreak@who.int to obtain the url address and their own specific password.

WHO requests that case-based information is sent weekly in a line-listing format (see Annex 3: *Template for line-listing* and Annex 4: *Data dictionary for line-listing*). The line-listing should include confirmed cases, all persons for whom the diagnosis of influenza A/H5 is being considered, and any discarded cases. A form to assist in data collection is also provided (see Annex 5: *Template for case report form*) and includes all variables requested in the line-listing.

WHO additionally requests Member States to send documentation of their case definitions, and any subsequent revisions of these definitions, to the relevant WHO country office, WHO regional office, and WHO headquarters, by e-mail or fax.

Only information regarding confirmed cases will be made available in the public domain.

2. Identifying and characterizing any emergent influenza strain so as to inform control strategies

Laboratory testing to define a confirmed case relates only to H5 and not to the N glycoprotein. In the event of a confirmed influenza A (H5N1) outbreak in animal populations, it is likely that human influenza cases are due to infection with the same viruses. Although laboratory testing to determine the N subtype should be completed, this should not delay reporting. Member States without laboratory capacity to complete N subtyping analyses are requested to forward specimens to one of the WHO reference laboratories for diagnosis of influenza A/H5 infection (see Annex 6).

Following the confirmation of a case of influenza A/H5 infection, genetic and antigenic characterization of virus strains should be performed. WHO requests that Member States forward aliquots of original specimens and the viral isolates to one of the WHO reference laboratories for diagnosis of influenza A/H5 infection (see Annex 6) to complete these genetic and antigenic analyses.

Reporting and dissemination of information

WHO requests that results of influenza A/H5 subtyping are included and updated in the line-listing (see Annex 3: *Template for line-listing* and Annex 4: *Data dictionary for line-listing*) as they become available.

WHO requests that results of genetic and antigenic characterization of virus strains are shared with the WHO Global Influenza Programme by e-mail or fax (see Annex 7: *Contact details for reporting to WHO*).

For further information regarding laboratory management, see:

- ***WHO guidelines for the collection of human specimens for laboratory diagnosis of Influenza A/H5 infection*;**
- ***WHO guidelines for the storage and transport of human and animal specimens for laboratory diagnosis of influenza A/H5 infection;*** *and,*
- ***WHO biosafety guidelines for handling specimens suspected of containing novel human subtypes of influenza.***

These documents are available at http://www.who.int/csr/disease/avian_influenza/guidelines/en/.

3. Monitoring changes in transmission patterns and detecting potential human-to-human transmission of influenza A/H5 viruses

Rationale

Changes in transmission patterns of influenza A/H5 in particular the development of human-to-human transmission, may be an indicator of antigenic drift, signalling an improved adaptability of the virus to cause human disease and an increased risk of genetic reassortment of the virus in the human population. Timely detection of these events combined with appropriate laboratory surveillance will facilitate the development of pandemic influenza vaccines and guide the implementation of any specific measures to slow down the spread of the virus in human populations.

Events under surveillance

A case report form should be completed for every individual for whom a diagnosis of influenza A/H5 viral infection is being considered (see Annex 5: *Template for case report form*). This will provide preliminary information about exposure history to help target further in-depth investigations. All individuals should be assigned a case classification according to the locally implemented case definitions.

A. WHO recommends a thorough field investigation of the first confirmed case of influenza A/H5 viral infection occurring in a public health district in any country or territory, to assess the exposures and the likelihood of human-to-human transmission.

   Subsequent confirmed cases should also be similarly investigated with priority being given to:
   - cases with most recent dates of onset;
   - cases resident in an area without reported HPAI outbreaks in the animal populations;
   - cases in health care workers;
   - cases with reported contact with a confirmed case and with no other reported risk or exposure;
   - cases that are part of a cluster[3];
   - sporadic cases with no reported risk or exposure.

   WHO will give priority to the deployment of technical teams to collaborate in these investigations.

B. WHO requests that Member States maintain daily records of the number of new hospital admissions of individuals for whom a diagnosis of influenza A/H5 is being considered. This is an indicator of

[3] A "cluster" is defined as two or more persons for whom the diagnosis of influenza A/H5 is being considered (including those persons who have died of an unexplained acute respiratory illness) with onset of symptoms within the same two-week period and who are associated with a specific setting such as a household, extended family, hospital, other residential institution, military barracks, or recreational camp.

potential disease activity in the population and is included in the *Template for daily country summary* (see Annex 2).

C. WHO requests that Member States maintain a daily tally of the number of confirmed cases for which there is no reported at-risk animal exposure[4] **and** no laboratory occupational exposure. In addition, WHO requests that Member States maintain a daily tally of the number of confirmed cases for which exposure history is unknown or undetermined. These indicators are included in the *Template for daily country summary* (see Annex 2). WHO will use these indicators to monitor the potential occurrence of human-to-human transmission.

D. Finally, WHO requests that Member States maintain a detailed daily profile of the current number of individuals by case category for whom the diagnosis of influenza A/H5 is being considered. This detailed profile is included in the *Template for daily country summary* (see Annex 2). Changes in trends in the number of individuals for whom the diagnosis of influenza A/H5 is being considered may be one of the first indicators of changes in transmission patterns.

Reporting and dissemination of information

WHO requests that Member States immediately send a brief descriptive account of any evidence suggesting human-to-human transmission to the relevant WHO country office, WHO regional office and WHO headquarters by e-mail or fax (see Annex 7: *Contact details for reporting to WHO*). The account should include information about the number of cases and the likely chains of transmission.

WHO requests that Member States adapt the *Template for daily country summary* (see Annex 2) to their case classification scheme and report daily the required summary data by e-mail or fax or through the secure password-protected WHO Global Atlas web site. Any Member State wishing to report daily summary data via the WHO Global Atlas web site should contact outbreak@who.int to obtain the url address and their own specific password.

WHO also requests that case-based information is sent weekly in a line-listing format (see Annex 3: *Template for line-listing* and Annex 4: *Data dictionary for line-listing*). The line-listing should include confirmed cases, all persons for whom the diagnosis of influenza A/H5 is being considered, and any discarded cases.

Only information regarding confirmed cases will be made available in the public domain.

4. Monitoring of unusual morbidity and mortality due to acute respiratory illness

Rationale

Prompt detection of unusual increases in morbidity and mortality due to acute respiratory illness should be triggers to timely laboratory investigations and appropriate public health measures.

Events under surveillance

WHO recommends that Member States continue with their existing surveillance for ILI and acute respiratory illness.

[4] "No reported history of at-risk animal exposure" is defined as no contact with live or dead domestic fowl, wild birds, or swine in any setting, **and** no exposure to settings in which domestic fowl or swine were or had been confined in the previous 6 weeks, **and** no at-risk animal-related occupational exposure.

WHO recommends that Member States with an existing early warning system for communicable disease or a surveillance system for severe or emerging acute respiratory illnesses, such as severe acute respiratory syndrome (SARS), actively investigate any unusual event and ensure that laboratory investigations for influenza are undertaken as appropriate.

In the absence of an existing communicable disease early warning system or a surveillance system for severe or emerging acute respiratory illnesses, Member States should consider the implementation of surveillance designed to detect unusual or unexplained events of acute respiratory illnesses in order to trigger appropriate public health and laboratory investigations. The surveillance activities should be determined by both risk assessment and consideration of the available capacities and infrastructure.

One or more of the following activities may be implemented:

- comprehensive or sentinel hospital-based surveillance for individuals with, and clusters of, acute respiratory illness on or during admission;
- surveillance of unexplained deaths due to acute respiratory illness in the community;
- surveillance of unexplained deaths due to acute respiratory illness in health care facilities;
- monitoring sales of antiviral drugs for influenza A viral infection, antimicrobials commonly used for the treatment of acute respiratory infections, decongestant drugs, or antitussive drugs.

In countries and territories where influenza A/H5 viruses have been identified as a cause of illness in human or animal populations since 1 October 2003, and their bordering countries and territories where **no** influenza A/H5 activity has been reported, consideration should be given to active surveillance of febrile illness in at-risk occupational groups defined in Section 1, *Monitoring the global occurrence of influenza A/H5 viral infections in humans*.

To increase the ability to detect unusual or unexplained events of acute respiratory illness, all institutions and organizations with responsibility for providing hospital-based care in any given country or territory should be encouraged to participate in surveillance activities and to share information in promptly with public health authorities.

Where ever possible, surveillance activities implemented for SARS and for influenza A/H5 should be integrated.

Through its well established mechanisms, WHO will continue to investigate rumours of international public health concern, including rumours of unusual events of acute respiratory illness, and seek further information about these rumours from Member States.

Reporting and dissemination of information

WHO requests that Member States immediately report any unusual or unexplained events under investigation for influenza A/H5 to the relevant WHO country office, WHO regional office, and WHO headquarters by e-mail or fax (see Annex 7). This will enable WHO to provide timely technical advice or assistance with the investigation of these events and facilitate timely and accurate dissemination of information to other Member States, the media, and the public, as appropriate.

5. Monitoring the global activity of influenza A/H5 viruses in animal populations

Rationale

Global surveillance for HPAI outbreaks in animals is critical for monitoring the circulation of influenza A virus subtypes with the potential to cause a new human influenza pandemic. With the current widespread animal epidemic in Asia of HPAI caused by influenza A (H5N1), up-to-date information on

HPAI outbreaks in animals that pose a human public health risk is needed for continuing risk assessment, risk management, and risk communication by WHO and public health authorities around the world.

Events under surveillance, reporting, and information dissemination

Members states of the World Organisation for Animal Health (OIE) are already obliged to urgently (within 24 hours) report suspected or confirmed HPAI outbreaks in animals to the OIE. OIE publishes on its web site information about any event for which it has received a report, through formal channels, from the Chief Veterinary Officer or Director General of the Livestock Department. Even in the absence of formal reports, OIE has also responded to the current widespread influenza A (H5N1) epidemic in animals by issuing press releases about countries or territories with established HPAI outbreaks due to influenza A/H5. A summary of the current HPAI outbreaks in animals is available on the OIE web site (see *Update on avian influenza in animals in Asia* at: http://www.oie.int/eng/en_index.htm).

WHO is collaborating with OIE as well as with the Food and Agriculture Organization of the United Nations (FAO). Through its well established mechanisms, WHO will investigate rumours of international public health concern, including rumours about deaths of at-risk animals or HPAI outbreaks in animals, and seek further information about these rumours from its Member States. Any information that WHO receives that substantiates these rumours of HPAI outbreaks in animals will be shared with OIE and FAO.

WHO therefore encourages Member States to engage all relevant government sectors in order to coordinate surveillance initiatives and to share information that will facilitate the timely laboratory confirmation of suspected HPAI outbreaks in animals, the timely reporting of these events to OIE, and timely implementation of appropriate prevention and control measures in the animal populations that will in turn reduce the human public health risk.

Annex 1: Case definitions used in Viet Nam

Viet Nam

Case definitions for influenza A/H5

Patient under investigation

Any individual presenting with fever (temperature ≥38°C)
AND one or more of the following symptoms:
- cough;
- sore throat;
- shortness of breath;

who is under clinical observation and laboratory investigations are under way.

Possible influenza A/H5 case

i. Any individual presenting with fever (temperature ≥38°C)
AND one or more of the following symptoms:
- cough;
- sore throat;
- shortness of breath;

AND one or more of the following:
- a. laboratory evidence for influenza A by a test that does not sub-type the virus**;**
- b. having been in contact during the 7 days prior to the onset of symptoms with a confirmed case of Influenza A/H5 while this case was infectious*;
- c. having been in contact during the 7 days prior to the onset of symptoms with birds, including chickens, that have died of an illness;
- d. having worked in a laboratory during the 7 days prior to the onset of symptoms where there is processing of samples from persons or animals that are suspected of having highly pathogenic avian influenza (HPAI) infection.

OR

ii. Death from an unexplained acute respiratory illness
AND one or more of the following
- a. residing in area where HPAI is suspected or confirmed;
- b. having been in contact during the 7 days prior to the onset of symptoms with a confirmed case of Influenza A/H5 while this case was infectious*.

Probable influenza A/H5 case

Any individual presenting with fever (temperature ≥38°C)
AND one or more of the following symptoms:
- cough;
- sore throat;
- shortness of breath;

AND limited laboratory evidence for Influenza A/H5 (H5 specific antibodies detected in a single serum specimen).

Confirmed influenza A/H5 case

An individual[§] for whom laboratory testing demonstrates one or more of the following
- a. positive viral culture for Influenza A/H5;
- b. positive PCR for Influenza A/H5;
- c. immunofluorescence antibody (IFA) test positive using Influenza A/H5 monoclonal antibodies;
- d. 4-fold rise in Influenza A/H5 specific antibody titre in paired serum samples.

[*] Individuals infected with Influenza A/H5 virus are considered to be infectious starting from one day before the onset of symptoms up to 7 days after onset of symptoms.

[§] Laboratory investigations for Influenza A/H5 may also be undertaken on deceased individuals and in the context of targeted epidemiological studies. Laboratory confirmed cases identified under these circumstances should also be reported.

Annex 2: Template for daily country summary

Reporting Country or Territory _____

Name of reporting Institution/Organization _____

Contact details of reporting person

Name _____
Telephone _____
Fax _____
E-mail _____
web page _____

Date of current report (dd/mm/yyyy) _____ **Date of last report (dd/mm/yyyy)** _____

Table 1: Laboratory confirmed cases

Name of reporting second administrative level[1,2]	Number of new confirmed cases since last update[3]	Cumulative number of confirmed cases since 1 October 2003	Number of new deaths among confirmed cases since last update[4]	Cumulative number of deaths among confirmed cases since 1 October 2003	Number of health care workers among confirmed cases	Number of confirmed cases with no at-risk animal exposure and no laboratory exposure[5]	Number of confirmed cases for which exposure history is unknown[6]
Total							

Table 2: New admissions and persons for whom diagnosis of influenza A/H5 viral infection is being considered Include all case categories that are not confirmed

		Probable cases[8,9]			**Possible cases[8,9]**			**Cases under investigation[8,9]**		
Name of reporting second administrative level[1,2]	**Number of new admissions[7]**	Current number of cases	Current number of deaths	Current number of health care workers affected	Current number of cases	Current number of deaths	Current number of health care workers affected	Current number of cases	Current number of deaths	Current number of health care workers affected
Total										

Notes

[1] Second administrative level is defined as second public health jurisdictional level below the national level.

[2] Add as many lines as needed to accommodate all reporting second administrative levels.

[3] Also includes cases reclassified as confirmed cases.

[4] Also includes deaths occurred among cases reclassified as confirmed cases.

[5] Includes confirmed cases with no reported at-risk animal exposure and no laboratory occupational exposure.
At-risk animal-related occupations include occupations such as domestic fowl or swine farm worker, domestic fowl processing plant worker, domestic fowl culler (catching birds, bagging birds, transporting birds, disposing of dead birds), worker in live animal market, chef working with live or recently killed domestic fowls, dealer or trader of pet birds.
Domestic fowl are birds that are commonly reared for their flesh, eggs, or feathers, and kept in a yard or similar enclosure, including chickens, ducks, geese, turkeys, guinea-fowls.

[6] Includes confirmed cases for which exposure history is unknown or undetermined.

[7] Includes cases in all case categories.

[8] Case categories need to be adapted to make them compatible with the case classification scheme implemented in the reporting country or territory.

[9] Add or remove as many case categories as needed to reflect the case classification scheme implemented in the reporting country or territory. Information regarding "Current number of cases," "Current number of deaths" and "Current number of health care workers affected" should be presented for each case category reported.

Full name of reporting Country	Class of case identifier	First Administrative Level	Second Administrative Level	City/Town/Village from where case was reported	Date case identified	Sex	Date of birth	Age	Age unit	Date of onset of symptoms	Admitted to hospital	Date of admission to hospital	Termination date of hospital stay	Isolated or cohorted	Date of isolation in trial hospital	Ventilated	Travel abroad	At risk animal-related occupation	Laboratory worker	Health care worker	Contact with domestic fowl	Contact with domestic fowl trading	Country where contact with domestic fowl	Contact with wild bird	Contact with domestic wild bird	Country where contact with wild bird	Contact with swine	Contact with domestic swine	Country
01_country	02_id	03_geo01	03_geo02	03_geo03	04_d_rep	05_sex	06_dob	06_age	06_unit	07_d_ons	08_adm01	08_d_adm01	08_d_dis	08_iso	08_d_iso	08_vent	09_abroad	10_occ_an	10_occ_lab	10_occ_hcw	11a_fowl	11b_fowl	11c_fowl01	11a_wild	11b_wild	11c_wild01	11a_swine	11b_swine	11c_swine01	

12_cont_c	12_cont_id	12_cont_dth	12_cont_x	13_clus	13_clus_id	13_clus_sett	14_no_an	14_ukn	15_cultH5	15_pcrH5	15_ifaH5	15_seroH5	15_subtype	15_reflab	16_disp	16_d_disp	17_d_dead	18_i_class	19_fin_class	19_d_fin_class

Annex 4: Data dictionary for line-listing

Variable name	Information	Format	Specifications	Comments
01_country	Full name of reporting Country	Text		Full name of reporting country or territory
02_id	Case unique identifier	Any format		Provide case unique identifier being used in the Country
03_geo01	First Administrative Level	Text		Name of first administrative level from where person was reported, defined as first public health jurisdictional level below the national level
03_geo02	Second Administrative Level	Text		Name of second administrative level from where person was reported, defined as second public health jurisdictional level below the national level
03_geo03	City/Town/Village from where case was reported	Text		Name of city/town/village from where person was reported
04_d_rep	Date case identified	Date format	dd-mm-yyyy	Date that the person first came to the attention of local public health authorities
05_sex	Sex	Text	M=Male F=Female U=Unknown	Sex
06_dob	Date of birth	Date format	dd-mm-yyyy	Date of birth
06_age	Age	Numerical		Age either in years or in months using 06_unit to indicate the relevant time unit
06_unit	Age unit	Text	Y=Years M=Months	Indicate time unit used to indicate age in 06_age
07_d_ons	Date of onset of symptoms	Date format	dd-mm-yyyy	Date of onset of symptoms
08_adm01	Admitted to hospital	Text	Y=Yes N=No U=Unknown	Admitted to hospital
08_d_adm01	Date of admission to hospital01	Date format	dd-mm-yyyy	If Yes to 08_adm01, date of admission. If the person became ill while in hospital the date of admission should precede the date of onset of symptoms.
08_d_dis	Termination date of hospital stay	Date format	dd-mm-yyyy	If Yes to 08_adm01, date of discharge from final hospital where person was admitted or date of death. To be completed ONLY once
08_iso	Isolated or cohorted	Text	Y=Yes N=No U=Unknown	If Yes to 08_adm01, person isolated or cohorted during any of hospital admission
08_d_iso	Date of isolation in final hospital	Date format	dd-mm-yyyy	If Yes to 08_iso, date of isolation or cohorted in final hospital. To be completed ONLY once
08_vent	Ventilated	Text	Y=Yes N=No U=Unknown	Ventilated during any hospital admission
09_abroad	Travel abroad	Text	Y=Yes N=No U=Unknown	During the 7 days prior to the onset of symptoms, travel to or reside outside reporting country/territory. Detailed travel history should be made available on request
10_occ_an	At-risk animal-related occupation	Text	Y=Yes N=No U=Unknown	Person involved in at-risk animal-related occupation during the 7 days prior to the onset of symptoms. At-risk animal-related occupations include occupations such as: domestic fowl or swine farm worker, domestic fowl processing plant worker, domestic fowl culler (catching birds, bagging birds, transporting birds, disposing of dead birds), worker in live animal market, chef working with live or recently killed domestic fowls, dealer or trader of pet birds
10_occ_lab	Laboratory worker	Text	Y=Yes N=No U=Unknown	Worker in laboratory where samples are tested for influenza A/H5 viruses
10_occ_hcw	Health care worker	Text	Y=Yes N=No U=Unknown	Health care worker
11a_fowl	Contact with domestic fowl	Text	Y=Yes N=No U=Unknown	During the 7 days prior to the onset of symptoms contact (within 1 metre) with any live or dead domestic fowl. Domestic fowl are birds that are commonly reared for their flesh, eggs, or feathers, and kept in a yard or similar enclosure, including chickens, ducks, geese, turkeys, guinea-fowls
11b_fowl	Contact with domestic fowl setting	Text	Y=Yes N=No U=Unknown	During the 7 days prior to the onset of symptoms, entered settings where domestic fowls were confined or had been confined in the previous six weeks
11c_fowl01	Country where contact with domestic fowl	Text		If Yes to 11a_fowl or 11b_fowl, list countries/territories, excluding reporting country/territory, where exposure occurred. Create as many fields as needed to accommodate the names of all countries/territories
11a_wild	Contact with wild bird	Text	Y=Yes N=No U=Unknown	During the 7 days prior to the onset of symptoms contact (within 1 metre) with any live or dead wild bird
11b_wild	Contact with domestic wild bird	Text	Y=Yes N=No U=Unknown	During the 7 days prior to the onset of symptoms, entered settings where wild bird were confined or had been confined in the previous six weeks
11c_wild01	Country where contact with wild bird			If Yes to 11a_wild or 11b_wild, list countries/territories, excluding reporting country/territory, where exposure occurred. Create as many fields as needed to accommodate the names of all countries/territories
11a_swine	Contact with swine	Text	Y=Yes N=No U=Unknown	During the 7 days prior to the onset of symptoms contact (within 1 metre) with any live or dead swine
11b_swine	Contact with domestic swine	Text	Y=Yes N=No U=Unknown	During the 7 days prior to the onset of symptoms, entered settings where swine were confined or had been confined in the previous six weeks
11c_swine01	Country where contact with swine	Text		If Yes to 11a_swine or 11b_swine, list countries/territories, excluding reporting country/territory, where exposure occurred. Create as many fields as needed to accommodate the names of all countries/territories
12_cont_c	Contact with confirmed case	Text	Y=Yes N=No U=Unknown	During the 7 days prior to onset of symptoms contact (within touching or speaking distance) with a laboratory confirmed case of influenza A/H5
12_cont_id	Unique identifier of confirmed case identified in 12_cont_c			Unique identifier of confirmed case identified in 12_cont_c
12_cont_dth	Contact with unexplained deaths	Text	Y=Yes N=No U=Unknown	During the 7 days prior to onset of symptoms contact (within touching or speaking distance) with a person with an acute unexplained respiratory illness which then resulted in death
12_cont_x	Contact with any other person for whom diagnosis of influenza A/H5 is being considered	Text	Y=Yes N=No U=Unknown	During the 7 days prior to onset of symptoms contact (within touching or speaking distance) with a person for whom diagnosis of influenza A/H5 viral infection is being considered. Include all case categories that are not confirmed and excludes unexplained deaths. To be updated if the classification of the case with whom the case has been in contact changes
13_clus	Person part of cluster	Text	A=Applicable NA=Not applicable	If Yes to 12_cont_c or 12_cont_dth or 12_cont_x, then person is part of a cluster, 13_clus=Applicable. Cluster is defined as two or more persons for whom the diagnosis of influenza A/H5 is being considered (including those persons who have died of an unexplained acute respiratory illness) with onset of symptoms within the same two-week period and who are associated with a specific setting such as a household, extended family, hospital, other residential institution, military barracks, or recreational camp ,either already identified or newly assigned

13_clus_id	Cluster identifier	Any format		If Applicable to 13_clus, indicate cluster unique identifier, either already identified or newly assigned. Suggest to use the unique identifier of the first identified case in the cluster as cluster identifier
13_clus_sett	Cluster setting	Text	HH=Household F=extended family H=Hospital I=other residential institution M=Military barracks R=Recreational camp O=Other	Defined setting in which cluster is occurring/occurred
14_no_an	No animal and no lab exposure	Text	A=Applicable NA=Not applicable	If No to (10_occ_an, and 10_occ_lab, and 11a_fowl, and 11b_fowl, and 11a_wild, and 11b_wild, and 11a_swine, and 11b_swine) then 14_no_an=Applicable; else then 14_no_an=Not applicable. This variable should be used to provide daily the number of confirmed cases with no reported at-risk animal exposure and no laboratory occupational exposure
14_ukn	Exposure history unknown or undetermined	Text	A=Applicable NA=Not applicable	If Unknown or blank to (10_occ_an, and 10_occ_lab, and 10_occ_HCW, and 11a_fowl, and 11b_fowl, and 11a_wild, and 11b_wild, and 11a_swine, and 11b_swine, and 12_cont_c, and 12_cont_dth, and 12_cont_x) then 14_ukn=Applicable; else then 14_ukn=Not applicable. This variable should be used to provide daily the number of confirmed cases for which exposure history is unknown or undetermined
15_cultH5	Positive viral culture for influenza A/H5	Text	Y=Yes N=No U=Unknown P=Pending	Positive viral culture for influenza A/H5
15_pcrH5	Positive PCR for influenza A/H5	Text	Y=Yes N=No U=Unknown P=Pending	Positive PCR for influenza A/H5
15_ifaH5	Positive IFA for influenza A/H5 monoclonal antibodies	Text	Y=Yes N=No U=Unknown P=Pending	Positive IFA for influenza A/H5 monoclonal antibodies
15_seroH5	4-fold rise in H5-specific antibody titre in paired serum samples	Text	Y=Yes N=No U=Unknown P=Pending	4-fold rise in H5-specific antibody titre in paired serum samples
15_subtype	Influenza H5 subtype	Text		Influenza H5 subtype
15_reflab	Samples sent for confirmation to WHO reference laboratory	Text	Y=Yes N=No U=Unknown	Samples sent for confirmation to WHO reference laboratories for diagnosis of influenza A/H5 infection
16_disp	Final disposition	Text	R=Recovered D=Deceased F=Lost to follow-up	R (=Recovered) includes persons discharged from hospital; L (=Lost to follow-up) includes persons lost to follow-up whilst still infectious. To be completed ONLY once
16_d_disp	Date of final disposition determined	Date format	dd-mm-yyyy	Date of final disposition determined
17_d_dead	If deceased, date of death	Date format	dd-mm-yyyy	If deceased, date of death
18_i_class	Interim case classification	Text	Confirmed Probable Possible Investigated Discarded	If 18_I_class=Confirmed then 19_fin_class=Confirmed. If 18_I_class=Discarded then 19_fin_class=Discarded. Case classification to be updated as appropriate. This variable provides the daily profile of current cases
19_fin_class	Final case classification	Text	Confirmed Probable Possible Investigated Discarded	To be completed ONLY once. Discarded cases should remain in the data set
19_d_fin_class	Date final case classfication assigned	Date format	dd-mm-yyyy	Date final case classfication assigned

Annex 5: Template for case report form

Case report form - Influenza A/H5

Case unique identifier **(02_id)** _____

1. Reporting details

Name of reporting Country or Territory **(01_country)** _____
Date of report to National Health Authorities (dd/mm/yyyy) ____/____/____

Contact details of person submitting the report
Name _____
Institution/Organization _____
_____
Address _____
_____
Telephone _____ Fax _____
E-mail _____

First administrative level from where person was reported **(03_geo01)** _____
(defined as first public health jurisdictional level below the national level)
Second administrative level from where person was reported **(03_geo02)** _____
(defined as second public health jurisdictional level below the national level)
City/town/village from where person was reported **(03_geo03)** _____
Date that person first came to the attention of local public health authorities
(dd/mm/yyyy) **(04_d_rep)** ____/____/____

2. Demographic details

Sex **(05_sex)** Male Female Unknown
Date of birth (dd/mm/yyyy) **(06_dob)** ____/____/____
Age **(06_age)** _____ expressed in **(06_unit)** Years
Months

Current contact details Full address _____
_____
Country _____
Telephone _____ Fax _____
Nationality _____ Ethnicity_____

3. Signs and symptoms

Date of onset of illness (dd/mm/yyyy) **(07_d_ons)** ____/____/____
Body temperature higher than 38°C Yes No Unknown
Cough Yes No Unknown
Sore throat Yes No Unknown
Shortness of breath Yes No Unknown

4. History of admission to hospital

Has the person been admitted to hospital **(08_adm01)** Yes No Unknown

If Yes, complete table [1] below

Note: If the person became ill while in hospital, include these details of this hospital stay under Hospital 01 in the table. Under these circumstances the date of admission should precede the date of onset of symptoms.

	Name of the hospital or hospital identifier	Second administrative level where hospital is located	Date of admission to hospital (dd/mm/yyyy)	Has the person been isolated or cohorted	Date of isolation or cohorted (dd/mm/yyyy)	Date person discharged from hospital[2] (dd/mm/yyyy)
Hospital 01			**(08_d_adm01)**	Yes No Unknown		
Hospital 02				Yes No Unknown		
Hospital 03				Yes No Unknown		
Hospital 04				Yes No Unknown		
Hospital 05				Yes No Unknown		

To be completed ONLY once

Termination date of hospital stay (correspond to date of discharge from **final** hospital, or date of death) (dd/mm/yyyy) **(08_d_dis)** ____/____/____

During any of the hospital admissions was the person:

Isolated or cohorted **(08_iso)** Yes No Unknown If Yes, date of isolation in **final** hospital (dd/mm/yyyy) **(08_d_iso)** ____/____/____

Mechanically ventilated **(08_vent)** Yes No Unknown

Admitted to an intensive care unit Yes No Unknown

[1] Add as many lines as needed to accommodate all hospitals in which the case was admitted

[2] Date case discharged from hospital: this corresponds to the date of discharge OR date of transfer OR date of death

5. Travel history

During the 7 days prior to the onset of symptoms, did the person travel to or reside **outside** the reporting country or territory **(09_abroad)** Yes No Unknown

If Yes, complete itinerary in table [3] below

Place of departure	Country/territory of departure	HPAI outbreak reported in the animal populations of country/territory of departure	Date of departure (dd/mm/yyyy)	Primary means of transport 1. Plane 2. Boat 3. Train 4. Bus 5. Other	Place of arrival	Country/territory of arrival	HPAI outbreak reported in the animal populations of country/territory of arrival	Date of arrival (dd/mm/yyyy)
		Yes No Unknown					Yes No Unknown	
		Yes No Unknown					Yes No Unknown	
		Yes No Unknown					Yes No Unknown	
		Yes No Unknown					Yes No Unknown	
		Yes No Unknown					Yes No Unknown	
		Yes No Unknown					Yes No Unknown	

Note: Although detailed information contained in this table is not included in the line listing, WHO may request for it to be made readily available should it be needed for international outbreak control purposes.

[3] Add as many lines as needed to accommodate all places visited

During the 7 days prior to the onset of symptoms, did the person travel to or reside in areas **within** the reporting country or territory? Yes No Unknown

If Yes, complete itinerary in table[4] below

Area of departure (Second administrative level)	HPAI outbreak reported in the animal populations of area of departure	Date of departure (dd/mm/yyyy)	Primary mean of transport 1. Plane, 2. Boat, 3. Train, 4. Bus, 5. Other	Area of arrival (Second administrative level)	HPAI outbreak reported in the animal populations of area of arrival	Date of arrival (dd/mm/yyyy)
	Yes No Unknown				Yes No Unknown	
	Yes No Unknown				Yes No Unknown	
	Yes No Unknown				Yes No Unknown	
	Yes No Unknown				Yes No Unknown	
	Yes No Unknown				Yes No Unknown	
	Yes No Unknown				Yes No Unknown	

[4] Add as many lines as needed to accommodate all places visited

6. Occupational exposure

During the 7 days prior to the onset of symptoms, has the person been working:

6a In an at-risk animal-related occupation[5] **(10_occ_an)** Yes No Unknown

6b Aa s worker in laboratory where samples are tested for influenza A/H5 viruses **(10_occ_lab)** Yes No Unknown

6c As a health care worker **(10_occ_hcw)** Yes No Unknown

7. History of exposure to animal populations

During the 7 days prior to the onset of symptoms, has the person:

	7a	***7b***	***7c***
	Contact (within 1 metre) with any live or dead animal of species listed	Entered settings where animal species were confined or had been confined in the previous six weeks	If Yes to 7*a* or 7*b*, and exposure occurred outside the reporting country/territory, list all countries/territories where these exposures occurred
Domestic fowl[6]	Yes No Unknown **(11a_fowl)**	Yes No Unknown **(11b_fowl)**	**(11c_fowl)** _____ _____ _____
Wild birds	Yes No Unknown **(11a_wild)**	Yes No Unknown **(11b_wild)**	**(11c_wild)** _____ _____ _____
Swine	Yes No Unknown **(11a_swine)**	Yes No Unknown **(11b_swine)**	**(11c_swine)** _____ _____ _____

[5] At-risk animal-related occupations include occupations such as: domestic fowl or swine farm worker, domestic fowl processing plant worker, domestic fowl culler (catching birds, bagging birds, transporting birds, disposing of dead birds), worker in live animal market, chef working with live or recently killed domestic fowls, dealer or trader of pet birds.

[6] Domestic fowl are birds that are commonly reared for their flesh, eggs, or feathers, and kept in a yard or similar enclosure, including chickens, ducks, geese, turkeys, guinea-fowls.

8. History of exposure to human cases

During the 7 days prior to the onset of symptoms, has the person been in contact (within touching or speaking distance) with:

8a A confirmed human case of influenza A/H5 infection **(12_cont_c)** Yes No Unknown

If Yes, indicate unique identifier of confirmed case identified in 8.a. **(12_cont_id)** _____

8b A person with an unexplained acute respiratory illness that later resulted in death **(12_cont_dth)** Yes No Unknown

8c Any other person for whom diagnosis of influenza A/H5 is being considered[7] **(12_cont_x)** Yes No Unknown

8d If Yes to 8a or 8b or 8c, the person is part of a cluster[8], tick "Applicable" **(13_clus)** Applicable Not applicable

8e If Applicable, is the cluster: Already known , indicate cluster identifier[9] in 8f
Newly identified , assign and indicate cluster[9] identifier in 8f

8f Indicate cluster identifier[9] **(13_clus_id)** _____

What is the setting of this cluster **(13_clus_sett)**

Household
Extended family
Hospital
Other residential institution
Military barracks
Recreational camps
Other , specify _____

Summary of exposure history

No reported at-risk animal exposure and no laboratory occupational exposure **(14_no_an)**:
tick "Applicable" if "**No**" to **6.a.**, and **6.b.**, and **all 7.a.**, and **all 7.b.**
Applicable Not applicable

Exposure history is unknown or undetermined **(14_ukn)**:
Tick "Applicable" if **"Unknown"** or **blank** to all the following items: **6.a.**, and **6.b.**, and **6.c.**, and **all 7.a.**, and **all 7.b.**, and **8.a.**, and **8.b.**, and **8.c.** Applicable Not applicable

[7] a person for whom diagnosis of influenza A/H5 viral infection is being considered: include all case categories that are not confirmed.
[8] A "cluster" is defined as two or more persons for whom the diagnosis of influenza A/H5 is being considered (including those persons who have died of an unexplained acute respiratory illness) with onset of symptoms within the same two-week period and who are associated with a specific setting such as a household, extended family, hospital, other residential institution, military barracks, or recreational camp.
[9] Cluster identifier: Suggest to use unique identifier of the first identified case in the cluster as cluster identifier.

9. Laboratory investigation results

Positive influenza A by rapid test	Yes	No	Unknown
High influenza A/H5 specific antibodies detected in a single serum specimen	Yes	No	Unknown
If Yes, indicate titre _____			
Positive viral culture for influenza A/H5 **(15_cultH5)**	Yes	No	Unknown
Positive polymerase chain reaction (PCR) for influenza A/H5 **(15_pcrH5)**	Yes	No	Unknown
Positive immunofluorescence antibody (IFA) test for H5 antigen using H5 monoclonal antibodies **(15_ifaH5)**	Yes	No	Unknown
4-fold rise in H5-specific antibody titre in paired serum samples **(15_seroH5)**	Yes	No	Unknown
Has influenza A/H5 virus subtype been identified	Yes	No	Unknown
If Yes, specify **(15_subtype)** _____			
Were samples or isolates sent for further confirmation to a WHO reference laboratories for diagnosis of influenza A/H5 infection [10] **(15_reflab)**	Yes	No	Unknown
If Yes, indicate laboratory:			
National Institute of Infectious Diseases, Japan	Yes	No	Unknown
Centers for Disease Control and Prevention, US	Yes	No	Unknown
National Institute for Medical Research, UK	Yes	No	Unknown
St. Jude Children's Research Hospital, US	Yes	No	Unknown
National Influenza Center - Government Virus Unit Hong Kong - SAR China	Yes	No	Unknown
The University of Hong Kong, Queen Mary Hospital Hong Kong - SAR China	Yes	No	Unknown
Institut Pasteur, France	Yes	No	Unknown
Other	Yes	No	Unknown
If Yes , specify _____			

[10] See Annex 6: *WHO reference laboratories for diagnosis of influenza A^/H5 infection*

10. Prophylaxis against influenza

Was the person vaccinated against influenza in the 6 months prior to the onset of symptoms

Yes No Unknown

If Yes, in which country _____

During the 7 days prior to the onset of symptoms has the person been taking any of the following medications

	Medication			If Yes,	Was the medication taken every day during this 7 day period		
Oseltamivir phosphate (Tamiflu®)	Yes	No	Unknown		Yes	No	Unknown
Zanimivir (Relenza ®)	Yes	No	Unknown		Yes	No	Unknown
Amantadine (Symadine ®, Symmetrel ®)	Yes	No	Unknown		Yes	No	Unknown
Rimantadine (Flumadine ®)	Yes	No	Unknown		Yes	No	Unknown

11. Final disposition (16_disp) **To be completed ONLY once**

Recovered (Recovered includes persons discharged from hospital)
Deceased
Lost to follow-up (Lost to follow-up includes persons lost to follow-up whilst still infectious)

Date final status was determined (dd/mm/yyyy) **(16_d_disp)** ____/____/____

For deceased persons ONLY
If person deceased, date of death (dd/mm/yyyy) **(17_d_dead)** ____/____/____

12. Case classification

Initial case classification Date initial case classification (dd/mm/yyyy) ____/____/____
Confirmed
Probable
Possible
Under investigation

Interim Case Classification **(18_i_class)**

	Date case classification assigned (dd/mm/yyyy)
Confirmed	____/____/____
Probable	____/____/____
Possible	____/____/____
Under investigation	____/____/____
Discarded	____/____/____

Final case classification **(19_fin_class)**
Confirmed
Probable
Possible
Under investigation
Discarded (Discarded cases should remain in the data set)
Date final case classification (dd/mm/yyyy) **(19_fin_class)** ____/____/____

Annex 6: WHO reference laboratories for diagnosis of influenza A/H5 infection

WHO Collaborating Centre for Reference and Research on Influenza
National Institute of Infectious Diseases
Gakuen 4-7-1, Musashi-Murayama
Tokyo 208-0011
Japan
Fax: +81 42 5610812 or +81 42 5652498

WHO Collaborating Center for Surveillance, Epidemiology and Control of Influenza
Centers for Disease Control and Prevention
1600 Clifton Road, Mail Stop G16
Atlanta, GA 30333
United States of America
Fax: +1 404 639 23 34

WHO Collaborating Centre for Reference and Research on Influenza
National Institute for Medical Research
The Ridgeway
Mill Hill
London NW7 1AA
United Kingdom
Fax: +44 208 906.4477

WHO Collaborating Centre for Studies on the Ecology of Influenza in Animals
Virology Division
Department of Infectious Disease
St. Jude Children's Research Hospital
332 North Lauderdale St.
Memphis, TN 38105-2794
United States of America
Fax: +1 901 523 2622

National Influenza Centre
Government Virus Unit
382 Nam Cheong Street
Shek Kip Mei
Kowloon
Hong Kong Special Administrative Region of China
Fax: +852 2319 5989

Department of Microbiology
Faculty of Medicine
University of Hong Kong
University Pathology Building
Queen Mary Hospital
Hong Kong Special Administrative Region of China
Fax: + 852 2855 1241

Unité de Génétique Moléculaire des Virus Respiratoires
Institut Pasteur
25 rue du Docteur Roux
75724 Paris Cedex 15
France
Fax: +33 1 40 61 32 41

Annex 7: Contact details for reporting to WHO

WHO Headquarters, Geneva

Global Alert and Response Team
Mobile: +41 79 500 6540
Fax: +41 22 791 1397
E-mail: outbreak@who.int

Global Influenza Programme
Tel: +41 22 791 3004
Fax: + 41 22 791 4878
E-mail: influenza@who.int

Regional Offices

WHO Regional Office for Africa-**AFRO**
Dr Paul Lusamba-Dikassa
Regional Adviser, Communicable Disease Surveillance and Response
Tel: +263 4 746 000/011/070
Fax +263 4 746 867/127
E-mail: lusambap@whoafr.org

Regional Office for the Americas/Pan American Health Organization-**AMRO/PAHO**
Dr Marlo Libel
Regional Adviser in Communicable Diseases, Disease Prevention and Control
Tel: +1 202 974 3129
Fax: +1 202 974 3259
E-mail: libelmar@paho.org

Regional Office for the Eastern Mediterranean-**EMRO**
Dr H. El Mahdi El Bushra
Regional Adviser, Communicable Disease Surveillance and Response
Tel: +20 2 276 52 91
Fax: +20 2 276 54 14
E-mail: elbushrah@emro.who.int

Regional Office for Europe-**EURO**
Dr Bernardus Ganter
Regional Adviser, Communicable Diseases
Tel: +45 39 17 13 98
Fax: +45 3917 18 51
E-mail: bga@who.dk

Regional Office for South-East Asia-**SEARO**
Dr M.V.H. Gunaratne
Regional Adviser on Communicable Disease Surveillance and Response
Tel: +91 11 337 0804
Fax: +91 11 337 8438
E-mail: gunaratnem@whosea.org

Regional Office for the Western Pacific-**WPRO**
Dr Hitoshi Oshitani
Regional Adviser in Communicable Disease Surveillance and Response
Tel: +632 528 9730/9964
Fax: +632 521 1036
E-mail: oshitanih@wpro.who.int and outbreak@wpro.who.int