

Report on the

**First consultation of the team of experts on  
avian and pandemic influenza**

Cairo, Egypt  
3–7 June 2007

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Regional Office for the Eastern Mediterranean

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## 1. INTRODUCTION

The World Health Organization (WHO) Regional Office for the Eastern Mediterranean (EMRO) organized the first regional consultation of a team of experts on avian and pandemic influenza in Cairo, Egypt, from 3 to 7 June 2007. The meeting was attended by representatives of ministries of health, the US Centers for Disease Control and Prevention (CDC), the Naval Medical Research Unit Three (NAMRU-3, a WHO collaborating centre), and UN sister agencies, such as the Food and Agriculture Organization of the United Nations (FAO), UNICEF, the World Food Programme (WFP) and the UN Office for the Commission of Humanitarian Affairs (OCHA). The objectives of the meeting were to:

- identify key health issues in public health emergencies;
- share the latest standards, guidelines and other technical documents on best practices in public health emergencies, with special emphasis on avian influenza and human pandemic influenza;
- share the strengths and weaknesses of responses undertaken by different countries so far afflicted by avian influenza and subsequent lessons learned and evidence-based recommendations thus derived;
- provide participants with the latest information regarding avian influenza diagnosis, surveillance and control;
- strengthen participants' basic epidemiological and laboratory surveillance skills, including the latest tools and methodologies used for reporting, investigation and control of avian influenza outbreaks;
- discuss potential health systems, economic and societal, challenges faced during public health emergencies, especially related to avian influenza and human pandemic influenza, and coping strategies and mechanisms required for preparedness and response; and
- share the latest risk communication strategies for effective crisis management in Member States of the Region.

The opening remarks of Dr Gezairy, WHO Regional Director for the Eastern Mediterranean, were read by Dr Jaouad Mahjour, WHO Director of Communicable Diseases, WHO Regional Office for the Eastern Mediterranean. He said that the frequency of natural disasters and their impact in human and economic terms had increased alarmingly at global level in the past two decades, with a disproportionately higher share for developing countries. The Eastern Mediterranean Region had seen its own share of both natural and manmade disasters with large numbers of people increasingly vulnerable. The three most challenging current humanitarian emergencies in the world (in oPt, Somalia and Sudan) were in the Region. However, through a timely humanitarian public health response and interventions, the adverse health impact of these crises could be significantly curtailed.

The Regional Office increasingly recognizes the importance of emergency preparedness and response and disaster management as a stand alone discipline, and the need for emergency responders to expand their knowledge base and utilize the scientific methods that this discipline offered. Both the World Health Assembly and the Regional Committee for the Eastern Mediterranean have passed resolutions asking WHO to support surge capacities

and assist Member States in emergency preparedness and response by developing a cadre of emergency experts readily deployable to respond to any crisis.

Dr Gezairy noted that 11 countries in the Region were affected by the avian influenza virus. Human cases have been reported from Djibouti, Egypt and Iraq. Egypt had witnessed the largest cluster of human cases outside South-East Asia and reported the highest number of confirmed human cases of avian influenza globally during the first quarter of 2007 (16 cases). The occurrence of outbreaks of avian influenza in the Region clearly indicated that it could be hit severely by pandemic influenza. Countries in the Region had invested time, funds and effort to increase their level of preparedness for response to avian influenza and pandemic outbreaks. Cases had been detected early and plans for appropriate interventions were ready. However, it is clear that implementation of national preparedness plans was not an easy undertaking and needed a lot of coordination.

The global commitment to prevent an influenza pandemic was reflected in World Health Assembly Resolution WHA58.5, endorsed in 2005, which articulated the need for global action and strengthening of national capacity to respond to the threat of a pandemic. The regional strategy was to complement the national efforts and enhance the capacity of countries to respond rapidly and effectively, to pre-empt the influenza pandemic as well as to mitigate the misery that a full blown pandemic was likely to inflict on humanity. The strategy underscored the importance of transparency and information sharing. The strategy focused on strengthening the capacities of the Regional Office and Member States to respond in a timely manner to outbreaks of H5N1 infection among humans.

The Chair was shared on a rotating basis. The programme and list of participants are included as Annex 1 and 2. Annex 3 contains the outcomes of group work.

## **2. UN HUMANITARIAN REFORMS**

*Mr J-L. Tonglet, WFP*

According to the UN/General Assembly (GA) resolution 46/182, the Emergency Relief Coordinator (ERC), Inter-Agency Standing Committee (IASC), Consolidated Appeal Process (CAP) and the Central Emergency Revolving Fund (CERF) have been reformed. During emergencies, all international assistance is in support of national authorities. The GA has mandated the ERC to coordinate the international response and the IASC to facilitate interagency decision-making to ensure a coordinated and effective humanitarian response on the ground. The Resident Coordinator (RC) who plays a critical role in coordinating UN policies, programmes and actions and facilitating the international humanitarian response to the crisis has to report to the ERC during disaster response.

Well-known, long-standing gaps, limited linkages between UN and non-UN actors, erratic coordination, insufficient accountability, proliferation of humanitarian actors, competitive funding environment, in addition to other problems were found from a 2005 humanitarian response review. Therefore, the humanitarian response needs to undergo reform based on the following four pillars.

- Partnership building: A stronger partnership between UN and non-UN actors is necessary as no single humanitarian agency can cover all humanitarian needs that should be organized by the government.
- Cluster approach: adequate capacity and predictable leadership in all sectors, in order to guarantee high standards of predictability, accountability, more partnership in all sectors or areas of activity, more strategic responses and better prioritization of available resources. Each cluster/sector lead should include key humanitarian partners; select the appropriate coordination mechanisms; coordinate with national/local authorities; local/civil society, have participatory and community-based approaches; pay attention to priority cross-cutting issues; and conduct needs assessment analysis of the situation.
- Humanitarian coordinators should ensure effective leadership and coordination in humanitarian emergencies. IASC has developed an action plan to strengthen the health coordination system that includes the establishment of broad-based humanitarian country teams; appointment of humanitarian coordinators with greater inclusiveness, transparency and ownership; provision of training and induction briefs; and the provision of support during emergencies and in transitional periods.
- Humanitarian financing should be adequate, timely and flexible. The GA decided to upgrade the CERF to US\$ 500 million. The CERF fund that has been created to ensure timely, adequate and flexible funding represents 4% of global humanitarian funding.

### **3. DISASTER AND HUMANITARIAN EMERGENCIES**

#### **3.1 Disasters and complex humanitarian emergencies: global and regional perspectives**

*Mr A. Musani, WHO/EMRO*

The increasing frequency of natural and manmade disasters and subsequent economic and societal costs, underscore the need for the adoption of disaster preparedness and mitigation as a discipline by stakeholders. Just in the past 20 years natural disasters have affected over 800 million people, killed over 3 million people with 96% of resulting impact borne by developing countries. Increasingly, crippled health systems' capacities, as a result of destruction or mortality or injuries, highlight the need for better preparedness and institutional readiness. Post-disaster, it is the coordination mechanisms between concerned agencies, line ministries and other stakeholders and community involvement—first responders in most of the cases—that will determine the adequacy of the response.

#### **3.2 WHO's role in humanitarian health action/cluster coordination**

*Mr A. Musani, WHO/EMRO*

WHO's role in health crises encompasses: assessing priority health needs; ensuring effective health sector coordination; making sure that critical gaps in health are filled; and strengthening local capacity and systems. In accordance with UN humanitarian reforms instituted as a result of a humanitarian response review conducted in 2005, major sectors/areas of humanitarian response have been assigned to specific agencies. Accordingly, with the consensus of all stakeholders, WHO has been identified as the cluster lead for the health sector.



The role is to provide health leadership in emergency and crisis preparedness; to provide response and recovery; to prevent and reduce emergency-related morbidity and mortality; to ensure evidence-based actions, gap filling and sound coordination; and to enhance the accountability, predictability and effectiveness of humanitarian health actions.

### *Discussions*

It is a challenge to synthesize the local system, especially in the presence of different competing players; however, it is important to engage the local system in the planning for, and management of, emergencies, so there will be awareness of the capacity of functioning in normal and emergency conditions. In the case of Pakistan, there were some areas within the health sector that were not functioning well, such as cholera notification as a part of the communicable diseases surveillance system, while other areas were fully functioning, such as maternal health. The range of functionality of the different services was discovered only during the crises.

Competency among the different organizations is likely to occur when applying the cluster approach during emergencies. Therefore, WHO should take the lead from the beginning in planning and organizing the international response. In the health field WHO is taking the lead in the different aspects of preparedness and emergency response. As a step forward WHO started a programme to build the capacities of the local systems in the Region by providing training to local people working in the different areas within the health sector on emergency preparedness and response. Unfortunately, the programme has been brought to a halt and is currently under review because of the lack of coordination among the different trained people.

One of the major challenges in emergency response is the availability of trained professional health workers. Health authorities need to invest in education and training of health professionals, so they are available as needed. The determinants of any disaster should be defined in order to be fully addressed and covered. Focusing on the medical field is important but not sufficient to overcome any disaster. Addressing the media during disasters is part of the response plan and qualified and skilled professionals are needed to talk to people and disseminate information.

Social mobilization is a key competent to deal with disasters as any community has its natural resources that absorb disasters. Building the capacity of any community and making it prepared to respond to disasters is an added value to the community. Therefore, communities should understand their role in disaster preparedness, how to carry out basic vulnerability analysis, how to identify threats and to develop preparedness plan based on local available resources.

Coordination and collaboration with the local governments/systems in different programmes is a requirement to achieve the best results. Certain tools are available to work with but they need to be updated frequently. However, the sustainability of this work is an issue of concern as financial resources are always needed.

Decentralization of local resources should be addressed with the local government in order to be able to easily respond to any disaster on the peripheral level. A detailed preparedness and response plan should be made available to the peripheral levels that include the different sectors of response with a focus on special programmes, such as women and child health. A task force group should be created in each country that includes different specialties from different areas, so as to be ready to be mobilized to the needed area for response.

The United States has a true desire to lessen the impact of the infectious diseases and to keep them out of their borders. As a result the Centers for Disease Control (CDC) has a new global disease detection programme that has been launched in five countries; Kenya, Thailand, Peru, Egypt and Indonesia. The one in Egypt will be housed within NAMRU-3 in Cairo. The global disease detection programme has three main components: an influenza detection unit that aims to detect the different types of influenza; a national emergency infection unit that aims to help countries to identify these diseases and to decide where to put their resources; and a field epidemiology training unit where a young epidemiologist can obtain training. A refugee health unit is also included in this programme.

### **3.3 Humanitarian information management**

*Dr I. Shaikh, WHO/EMRO*

Humanitarian information management is critical to the efficiency and effectiveness of response operations. It helps to assess needs, assets and capacities and identifies critical gaps. The goal is to get the relevant information to the right person/s at the right time to guide prioritization processes, decision-making and resource allocation. The need to coordinate and share information between partners during any crises is further underscored by the fact that during crisis, pre-existing information systems deteriorate or collapse, coverage gets reduced or totally eroded, and insecurity and population movements lead to unstable estimations. Furthermore, proliferation and fragmentation of information systems often increase the "background noise", thus good data may be hidden by bad data.

However, whereas accuracy is a required attribute, 100% accuracy may not be a desired quality of information in a crisis for obvious reasons as it may entail loss of valuable time and resources and cause significant opportunity costs. Use of available data, its triangulation, coupled with only a collection of essential pieces of missing information, albeit with reasonable accuracy and reliability, should be the guiding principle in such situations.

#### *Discussions*

Sharing and exchanging information on health needs and monitoring the health situation during both chronic and acute crisis period is important in order to identify the priorities, to be prepared and effectively respond to emergency crisis, to propose solutions to emerging problems and to monitor and evaluate the effectiveness of interventions.

During emergencies, only information that will be used has to be collected. The dissemination of this collected information will be used as a tool for conducting health needs assessment and identifying the gaps in the health situation that need to be filled in through the international community's responses. However, developing countries are notorious for their lack of accurate information, and the lack of interest of some countries in publishing some relevant information is a considerable problem, too, where they tend to blow up other irrelevant information during crises in order to gain funds.

It is essential that an effective and reliable health sector information, coordination and management system is available and sustainable with a priority on public health aspects of the crisis, particularly health service provision related to primary health care, as well as secondary and tertiary care levels, to facilitate a rapid and coordinated response and to avoid duplication and overlapping of responses. An agreed mechanism should be in place among the different stakeholders, including the private sector to ensure regular information collection, analyses and interpretation of the health sector situation. Sustainability and maintenance of such a mechanism is important in mobilizing resources quickly during any kind of health emergency, thus improving preparedness strategies and contingency plans.

Involving the private sector in the information system is an issue that should be seriously considered. In the case of Lebanon during the conflict the Government did not have enough information to build on and respond, as most of the health care services had been taken over by the private sector who were unwilling to share information with the Government.

Efforts should be made to encourage the ministries of health to have an archiving information system where continuous access to valid and reliable information could be ensured and used in the best practices.

### **3.4 Rapid health assessment**

*Dr I. Shaikh, WHO/EMRO*

Rapid health assessment provides a crude but speedy method for generating information on critical life-saving needs and gaps and allows the determination of the magnitude of an emergency and the urgency for required remedial measures. At the minimum, critical areas that merit assessment and need to be included in the rapid health assessment include health, water, sanitation, nutrition, shelter and other essential non-food items.

#### *Discussions*

Humanitarian information is part of the routine collected information system which provides the basics that can be built on during emergencies; the quality of this information is of concern. Usually, different programmes with different providers are available in each country; therefore, coordination among the different players is highly needed, which will improve quality rather than having different information. Different types of data are usually

available in the form of surveillance, surveys, registries, etc. however, during crises surveillance data that can be used to take action or respond to crises should be given priority.

In case information is not available for the denominator for some indicators, a continuous collection of information could be used for rapid health assessment and many scientific ways are available in order to derive the required estimates.

Some institutions have started to train health professionals on conducting rapid health assessment in their community under normal conditions, so they will have the experience to do it efficiently during emergencies. Efforts should be made to conduct this activity in different countries.

### **3.5 Emergency response operations**

*Dr I. Shaikh, WHO/EMRO*

An emergency operational plan is a critical tool that post-event allows for the setting of overall goals and objectives, a course of action and assigns clear roles and responsibilities for optimal and coordination response operations.

#### *Discussions*

Any emergency operational plan should include the different sectors and tasks and responsibilities for each sector. It should be the road map for each sector on the way to respond to emergencies. Many tools are available in the UN system on the design and structure of the operational plans that can be applied in different scenarios of emergencies.

### **3.6 GPS and map reading**

*MS E. Abdelghaffar, WHO/EMRO*

A map is a graphical representation of a portion of the earth's surface and features drawn to scale. It provides information on the existence, the location of, and the distance between ground features, such as populated places and routes of travel. It also indicates variations in terrain, heights of natural features and the extent of vegetation cover. In addition, it provides information needed to resolve humanitarian logistical planning. Hence, an appropriate map of the area is a handy basic tool during missions.

There are different types of maps. Reading maps should start from the legend and marginal information, including the north arrow and the map scale. Maps have a uniform system of referencing, one of which, that is most widely used, is the geographic coordinates system. Geographic coordinates are expressed in angular measurement, i.e. each circle is divided into 360 degrees, each degree into 60 minutes, and each minute into 60 seconds.

In order to identify the geographic coordinates of a location, field officers must not only be able to identify their location/coordinates from the map, but also must practise using the global positioning system (GPS) before going on missions, as learning its use is done by

practice. The GPS is a satellite-based navigational system that consists of active satellites. Each satellite transmits data that enable the GPS receiver to provide a precise position to the user. The more unobstructed the view of the sky, the better the GPS performs. It is important that field officers understand maps, always know where they are, can estimate distances to main roads and/or services, and are prepared to transmit their location at any time using the GPS.

## **4. SURVEILLANCE AND EARLY WARNING DURING CRISIS**

### **4.1 Surveillance in crisis**

*Dr I. Shaikh, WHO/EMRO*

Surveillance post acute crises should be started as soon as possible and should address only priority, epidemic prone, health issues with highest morbidity and mortality risks and those that could be acted upon with respect to mitigation and remedial measures. The system should also have adequate early warning and outbreak investigation capacities to be able to respond to/investigate rumour(s) within 24 hours.

Disease surveillance under such circumstances may not serve to produce a complete accounting of disease incidence but rather flexible and robust enough to rapidly detect epidemics. Software and data analysis should be kept as simple and field friendly. Where available, crisis specific surveillance systems should complement or augment pre-existing surveillance systems.

#### *Discussions*

A sensitive early warning system is highly needed to detect the first signs of changes in viruses and clear case definitions for different case categories—for certain viruses—should be used. Notification for seasonal influenza has been included in the notifiable disease surveillance system and strongly monitored in order to detect unusual clusters of cases. Coordination among the different health providers is required to ensure their involvement in the surveillance system.

It is important to have a multi-surveillance system, where information is complemented from the different areas, including: sentinel hospital-based surveillance for individuals with acute respiratory illness on or during admission to hospital, surveillance of unexplained deaths caused by acute respiratory illness, or of clusters of severe acute respiratory illness in the community, surveillance of unexplained deaths caused by acute respiratory illness in primary health care facilities or unusual mortality in commercial bird flocks or animal herds; veterinary surveillance in addition to laboratory surveillance. Monitoring of incoming travellers from infected regions, countries or localities to the country arriving by all means of transportation, people involved in culling birds or animals infected with influenza and other people exposed to birds or animals infected with influenza, for example farmers and veterinarians, health care workers caring for patients with suspected or confirmed pandemic strain influenza infection.

## 4.2 Team composition and selection

*Dr N. El Tantawy, WHO/EMRO*

One of the most important functions of surveillance is to detect outbreaks as they evolve. The response to this outbreak situation should be aggressive and timely in order to decrease and prevent more mortalities and morbidities.

Rapid response teams are those who carry out outbreak investigations and institute preventive and control measures; therefore team members should be carefully selected from different disciplines to coordinate their efforts within well-defined roles and responsibilities to deal with different aspects of an outbreak.

Once information on an outbreak occurrence is verified, rapid response teams are deployed to the field as early as possible. In the course of investigating an outbreak, rapid response teams should provide health care facilities and health care workers with whatever technical support they might need, particularly in the areas of infection control practices and standardized case management protocols.

The composition of rapid response teams depends on the availability of health professionals and the investigation circumstances; furthermore, it should be ensured that team members have the knowledge and skills to fulfil their roles.

A team leader has a lot of relevant responsibilities; s/he should be responsible for managing the team and make sure that work is done. Epidemiologists—as team leaders—are responsible for monitoring health status and conditions, including the eruption of any disease outbreak during emergencies, identifying determinants of the outcomes and required measures to control it. Data collection, analyses and interpretation are under their responsibility, as well. Clinicians, laboratory specialists, veterinarians and communication officers perform other functions as related to their specialties. Logisticians are essential members of the team in most instances of outbreak investigations.

Finally, rapid response teams at national level are joined with regional and sometimes international teams in outbreaks of international concern. All team members should act as team players and coordinate with each other and with national authorities and avoid work sensitivities.

### *Discussions*

A trained team should be created from different specialties so as to rapidly respond to any crises. The tasks and responsibilities of each member of the team have to be clear and understood by the other members of the team. Coordination of the activities of the team with the local authorities, bearing in mind that the team should technically support them not replace them, has to be carefully considered.

The team leader is a senior public health officer who is usually not doing the daily work but delegates the work to the different members of the team and coordinates the activities among them, shares information, identifies gaps and challenges and shares recommendations with the members of the team.

It is important to understand the existing behaviours for different groups that need to be tackled during emergencies and to ensure that technical agencies have consensus on the key behaviours that will control an outbreak, therefore, integrating of social mobilization officers within the team is to be highlighted as they tend to tell people of the exact behaviour that should be adopted during emergency. Many of the regional response teams have started to include new members in the team, including: a medicine distributor who distributes medicines during emergencies; ecologist, as veterinarians or public health officers will not be able to cover this part; and a psychologist who conducts stress management sessions either for the community or for team members during emergencies, since psychological well-being of emergency response personnel dealing with emergency situations can greatly affect the overall outcome of such situations, including the prognosis of the primary victims of the event. It is important to include a logistics officer in the team, as well, who will be responsible for all the work related to shipping specimens and heavy supplies.

#### **4.3 Outbreak detection and investigation/coordination of outbreak response**

*Dr L. Opoka, WHO/EMRO*

The WHO phases of international outbreak alert and response operations starts when an outbreak alert is received through formal or various informal sources. WHO then verifies the rumour through the WHO country offices and the ministry of health of the affected country. Once the outbreak is verified and based upon a request by the country for assistance, WHO activates an international response to the crisis. Through the global outbreak alert and response network (GOARN), WHO can assemble an outbreak response team that can be sent to the field within 48 hours. The team will conduct outbreak investigation, establish control measures to contain the outbreak and at the end of the mission compile a preliminary report and share it with the WHO Representative and the MOH before leaving the country.

The new International Health Regulations (IHR 2005) require that all outbreaks of international importance must be assessed. Moreover, WHO has in place the events monitoring system that acts as disease intelligence or a tracking system. WHO verifies all rumours of disease outbreak that are reported, gathers more information on the outbreak to share with partners and provides affected countries with technical support, such as conducting laboratory investigations and producing guidelines.

It is important to understand the purpose for investigating avian influenza outbreaks in humans and to understand the key steps of the investigation. This includes, the importance of pre-investigation planning, determining who, when, where, why and how the people are affected, drawing conclusions and identifying challenges. The goal of an avian influenza outbreak investigation is to: assess precisely an outbreak situation; detect potential additional cases; prevent further human cases by initiating control measures; eliminate source(s) of

infection; detect human-to-human spread. It must be understood that avian influenza investigations are multidisciplinary and efficient communication with stakeholders (e.g. authorities and public) is critical.

Before initiating an avian influenza investigation in humans there must be a signal for the investigation. This usually would include when there is a suspected case of human H5 infection, patients' deaths with moderate to severe respiratory illness of unknown aetiology and H5-positive laboratory results, usually in a context of unexplained animals/poultry death or in an H5 confirmed area. This will be followed by pre-investigation preparations; the team goes to the field, confirms the outbreak and establishes control measures, describes the outbreak, draw conclusions, write reports and communicates their conclusions and recommendations to all stakeholders.

### *Discussions*

Several participants confirmed that avian influenza outbreak investigations are intended to allow for understanding the source and mode of human infection, quantifying risk for further infection and implementing adequate response and prevention measures, however, having authority is a prerequisite in order to be able to implement it.

Each suspected H5 patient must be subject to thorough and immediate investigation (patient and field investigation) to understand the circumstances of infection, to detect additional suspected patients and to determine whether human-to-human transmission occurred and with what level of efficiency. In case of the occurrence of an H5 cluster—where a group of suspected, probable and/or confirmed human cases of influenza H5 who experienced disease onset within a defined period of time in a same defined geographical area and which can be epidemiologically linked to each other—many indicators should be investigated, such as timeline of pertinent exposure events and dates of illness, potential exposure history and onset of illness for each case, whether the cases occurred within the same incubation period and whether the cases include members from the same family. Each animal avian influenza outbreak should lead to immediate investigation and further enhanced surveillance in both human and animal populations to assess the threat to humans and to detect further cases.

So far, there is no evidence to suggest airborne transmission of the disease. Nevertheless, because of the high mortality of the disease and the possibility of the virus mutating to cause efficient human-to-human transmission, it is recommended that strong precautionary measures are followed. Although, reporting on human-to-human transmission was confirmed during the avian influenza outbreak in Indonesia, the term “easily transmissible” included in the case definition was not confirmed in the mode of transmission.



## 5. RAPID RESPONSE AND CONTAINMENT MEASURES

### 5.1 Avian influenza: global and regional update

*Dr J. Jabbour, WHO/EMRO*

#### *Avian influenza*

There are different types of influenza disease—seasonal, avian and pandemic influenza—which require different strategies to address. Avian influenza is a disease that attacks birds and is of two patterns: low and high pathogenic. The current virus causing the avian influenza outbreaks is H5N1, which is highly pathogenic.

Exposure of human beings to the highly pathogenic avian influenza virus is increasing. As of 4 June, 2007, 309 confirmed human cases of avian influenza were reported to WHO, including 188 deaths (case–fatality rate of 61%). Egypt has reported the highest number of human cases since the beginning of 2007. Thirty-four cases have been reported to WHO in Egypt with 14 deaths since March 2006, out of which, 16 cases were reported in 2007, including three deaths. Since the beginning of the outbreak the Egyptian national authorities tested 2996 avian influenza suspected human cases and 34 cases were positively confirmed as having H5N1.

Reassortment of the circulating H5N1 with the seasonal influenza virus or adaptive mutation of the animal strain, which will produce a new human pandemic strain causing the human pandemic influenza, is of global concern.

#### *Human pandemic influenza*

There are three prerequisites for the human pandemic influenza to occur: (1) a new influenza virus emerges in a general population with little/no immunity; (2) the new virus must be able to replicate in human beings and cause disease; and (3) the new virus must be efficiently transmitted from one human to another. The first two prerequisites have been achieved but until this moment there is no human-to-human transmission of the virus. WHO is still declaring phase three of the pandemic and it is only WHO that declares the change from one phase to another. If the pandemic starts, one third of the population of the Region will fall ill. Two thirds of the burden of the pandemic will be in four countries in our Region: Afghanistan, Egypt, Islamic Republic of Iran and Pakistan. The pandemic will disrupt every single aspect of life.

The WHO global influenza preparedness plan depends on reducing the risk of transmission through avoiding the emergence of a new virus, eliminating the animal reservoir and protecting risky groups, strengthening animal and human surveillance and improving human pandemic influenza preparedness through vaccine development, access to antiviral medicines, implementation of non-pharmaceutical interventions and developing national and international plans.

In conclusion, WHO will be working on building capacities for surveillance and response and for laboratories, improving access to antiviral medicines and vaccines, strengthening coordinated leadership, providing Member States with updated technical guidelines and standard operating procedures and improving resource mobilization, including funding.

### *Discussions*

Behaviour/perception are the key elements of controlling avian influenza. WHO should support the launch of community health education campaigns, especially in rural areas that are considered risky areas, so as to enhance hygiene practices; to change behaviour/attitude; to self-monitor the onset of disease symptoms; and to rapidly report the onset of symptoms. These campaigns included: a sensitization programme that focuses on the sensitization of people to the disease; pre-pandemic programme that delivers messages on what should be done to prevent transmission of the disease; and a post-pandemic programme that delivers messages on how to deal with the disease and how to protect oneself.

The issue of compensation mechanisms should be addressed thoroughly with local government so as to encourage the early reporting of an outbreak, especially in rural areas. WHO should technically and financially support the production and the implementation of this mechanism.

## **5.2 Steps of rapid response and containment**

*Dr H. El Bushra, WHO/EMRO*

The present situation of avian influenza is categorized as phase three, where human infections with a novel virus subtype (H5) are occurring, but there is no evidence that the virus is spreading efficiently and sustainably among humans and human cases at present are isolated and rare. Rapid containment of the virus is crucial to ensure rapid detection and investigation of clusters of cases, closely related in time and place, which is considered an epidemiological signal of improved transmissibility among humans, but is not yet spreading efficiently and sustainably, with virology evidence. During phases 4 and 5, and depending on the operational circumstances of the spreading of the virus, some measures should be put into operation by the national authorities with strong collaboration at all levels of government officials, policy-makers, health care and public health professionals, community leaders and the public with full support from WHO regional offices and headquarters to reduce transmission and prevent, or at least delay, further spread of the virus.

There are two major public health interventions for prevention control and to contain influenza: pharmaceutical interventions that include vaccination, treatment and prophylaxis with antiviral and non-pharmaceutical interventions including isolation of ill persons, voluntary quarantine of exposed persons, social distancing measures, including school closures and cancellation of mass gatherings, in addition to other measures to minimize people density, such as staggered work and market hours.

The implementation of the containment measures depends on the identification of the containment zone, where the initial cluster of infected cases is located, the hot zone, where the initial cluster is small and tightly clustered and the immediate surrounding area that is the borders around the containment zone.

In the containment zone, hot zone and immediate surrounding area, the control of all non-essential movement in and out of the zones and the transit of goods and services and the screening of international airports, should be put into practice. The implementation of all non-pharmaceutical interventions measures is a must in the containment zone and in the hot zone, whilst isolation of ill persons and voluntary quarantine of household and other close contacts would be enough non-pharmaceutical intervention measures to be implemented in the immediate surrounding area.

The number of infected cases and contacts is the key to whether to administer the pharmaceutical interventions to the hot zone only or to the entire population in the containment zone and the success of the administration of the pharmaceutical intervention is tied to the size of target population, time of delivery and compliance. Treatment of ill persons and prophylaxis of contacts should be administered in the immediate surrounding area as pharmaceutical interventions. If the containment zone and the immediate surrounding area cross national borders, the implementation of the same pharmaceutical intervention and non-pharmaceutical intervention measures should be agreed upon between national authorities.

In both areas, enhancing surveillance at national and international levels, especially in the immediate surrounding area to rapidly detect transmission outside of the containment zone and to guide revision of containment zone boundaries if “leakage” from containment zone occurred; tracing contacts; and encouraging research to study the transmission patterns, risk factors, case fatality rates and effectiveness of administered antiviral for treatment and prophylaxis are important ongoing measures to guide the continuation of measures and monitor their impact during containment.

Communication with the community is very important during each step of the outbreak. Social mobilization which is focused on individuals, households and communities is important, as well, to encourage support and compliance with containment measures, reduce panic and to prepare affected and non-affected populations for the possibility of failure and pandemic mitigation.

At the start of a pandemic and for many months thereafter, all countries will face inadequate supplies of vaccines, since the subtype of the influenza virus is not known to produce vaccines ahead of time and after the production of the vaccine slow immune response and the uncertainty of the efficacy/effectiveness are of concern. Inadequate supply of antiviral medicines will be a problem as well during the containment phase as the goal is to reach 90% coverage of the target population within a short period of time and with high compliance. Therefore, the implementation of non-pharmaceutical interventions will be effective measures in reducing transmission and delaying the spread of the virus.

### *Discussions*

During human pandemic influenza, the early administration of mass treatment, together with other interventions in a short period of time, could probably kill the virus. The Virology-based evidence is needed on a new strain of the virus in order to start with. The emergence of such a new virus will be localized in a very small area and early detection of the virus and mobilizing resources to the infected area will be the first step in containing it. A containment zone that goes beyond the hot zone will be defined, and then the immediate surrounding area will be put under quarantine measures in order to prevent transmission of the disease. The containment zone and the area surrounding it will be in the same country or it could cross the borders of the national country that might generate some delay in containing the problem.

Oseltamivir is the best medicine currently available that reduces morbidity and mortality and there are different theories for the distribution of the medicine to cover each single zone. However, the current available medicines are not considered as treatment. During the human pandemic influenza, administration of the vaccine will take a very long time. Therefore, non-pharmaceutical treatment or early containment is the best way to control it. In this regard, local governments should seriously consider the production of national pre-pandemic contingency plans that focus on preparedness, response and containment of pandemic influenza. Social mobilization and mass communication is important to be addressed in the plan in order to deliver the right messages at the right time. Coordination among the different providers in each country to produce one national contingency plan is crucial, too. Preparedness should be enhanced in communities by providing them with the different expected scenarios and ways to deal with each one.

Within the outbreak zone, detection and reporting of individual cases and clusters of human-to-human transmission by strengthening the surveillance system at different national levels with different case definitions is very crucial in order to manage the outbreak, to monitor its evolution and any further geographical spread and to evaluate containment measures and the need to modify the containment strategy. Active case finding; tracing of contacts of cases and following them up for evidence of respiratory illness is another important step in containing the disease; administration of antiviral medicines to cases of moderate-to-severe respiratory illness and to their contacts; and quarantine are very important steps to contain the disease. The introduction of social distancing and discouraging non-essential travel are important measures as well in later stages of the augmentation of the pandemic.

## **6. LOGISTIC SUPPORT**

### **6.1 Introduction to logistic support systems**

*Mr V. Martinez, Private consultant*

A number of countries, nongovernmental organizations and six UN agencies (WHO, WFP, OCHA, UNICEF, United Nations High Commissioner for Refugees (UNHCR), and

Pan-American Health Organization (PAHO) have contributed their experience and expertise to develop logistics support systems (LSS).

Financial support was provided by the Swedish International Development Agency (SIDA), the UK Department For International Development (DFID), the Office of Foreign Disaster Assistance of the United States Of America (USAID/OFDA), the Canadian International Development Agency (CIDA), the European Union Directorate General for Humanitarian Aid (ECHO) and the Ministry of Foreign Affairs of the Dutch Government to develop the LSS.

Setting up the LSS system in emergency situations improves transparency in the management of humanitarian supplies and enables reports to be prepared that can be shared with donors, authorities in disaster-stricken countries, humanitarian agencies and the media.

Many large humanitarian agencies already have proprietary commodity-tracking systems. LSS is not a tracking system; however, it complements these agency-specific systems. Also, it provides national authorities, UN agencies and other coordinating bodies with an overall picture of what has been pledged and what has arrived for a specific emergency. In addition, it has the ability to compile and report on data that are directly entered in its databases, as well as on information that is collected from other tracking systems.

## **7. RISK COMMUNICATION AND SOCIAL MOBILIZATION**

### **7.1 Crisis communication in human emergencies**

*MS S. Bootsma, WHO/EMRO*

Communication and information are important tools to improve the health of disaster-affected populations. Improving exchanges of information in order to facilitate coordination, to improve the effectiveness of work and to increase impact, would improve the transparency of the information and assist in attracting donors' funds.

Information used to come from only one source and was poorly disseminated, although these days it comes from many sources. The source, timeliness, reliability/validity, completeness and contents, which permit an appropriate decision-making process, are all important factors that should be considered during the preparation and dissemination of information.

Sharing information through different reports, updates, publications and bulletins is a prerequisite for emergency preparedness that improves the response for emergencies through conducting rapid needs assessment, coordinating international aid and updating the donor community and the other stakeholders.

## **7.2 Importance of advocacy and social mobilization activities in controlling avian influenza**

*Dr I. Kerdany, WHO/EMRO*

The importance of communication during any outbreak cannot be emphasized enough and this is particularly the case with regard to avian influenza. The effect of the disease on society and the economy, the continuous rise in human cases worldwide and the unsettling fear that the virus may mutate gives further incentive for pandemic preparedness.

When the disease was first detected in birds in February 2006 the media scrambled to gather information and promote public awareness to counter the spread of the disease. Over 15 000 articles were written in the Arab press in that year alone. By the end of March 2006 a total of three human cases had been detected in Egypt with one death. When the summer came and the risk of the disease significantly decreased, the public's attitude to the crisis relaxed to a large extent. As a result, they were not prepared for the new cases that began to emerge in September. This also resulted in a dramatic waning of interest on the part of the media. Just over 6000 articles were published in 2007, despite the fact that the number of human cases and deaths had rocketed to 34 and 14, respectively.

On a positive note, however, much was done to inform the public about what to do if any cases were detected in either birds or humans. A 24-hour hotline was established through which all cases could be reported and the numbers were published in all local newspapers and broadcast on both local and satellite channels. 120 physicians were on call 24-hours a day to answer any questions about the disease and its hazards. These are all contributions that have helped develop outbreak communication and many lessons have been learnt from this experience. This also enables us to identify the key factors that ensure successful outbreak communication, namely: building and maintaining trust, transparency, honesty, competence, early reporting and message-making.

### *Discussions*

Human behaviour plays a key role in avian influenza transmission, therefore; developing national contingency plans, including risk communication plans that address the different target groups (e.g. press, general public, health care workers, parliament, and specific risk groups) is important. Possible materials that are needed and distribution mechanisms to reach the target groups in all outbreak response planning can build and maintain the trust of the public, which aims at inducing behavioural change and reducing risk. Developing good relations with professional specialists is also important to help with the development of accurate and timely messages, before and during a pandemic. These messages can be tailored in a way that creates value without affecting the economic situation, especially in countries that depend on the poultry sector as a source of national income. National consistency of the distributed information in each country is crucial. Different messages could be used in the different countries depending on the situation.

Health communicators have a different role than journalists, where the latter tend to convey significant information that has an interest to the public but does not aim to induce change or build trust between the public and the authorities. The public depends on the media, as well as the health communicators for information in a crisis. However, the media does not understand the scientific complexities of avian influenza and pandemic influenza and need to be empowered to understand these complexities.

Weak surveillance, real or perceived competing interests or uncomfortable spokespersons or public health officials delivering bad news, are all factors that affect the transparency of communication between the public and the decision-makers. Therefore, by keeping detailed records of decision-making meetings, delivering regular proper briefings/messages that include the possibility of the infection and eliminates the reassurance of not getting the infection by trained communicators, in order not to lose credibility and listening to the public about their concerns and needs would improve this transparency.

Collection and dissemination of information related to the pandemic in all its phases and levels should be coordinated among the different units involved in the avian influenza response and the need for certain mechanisms to guarantee information-sharing among national authorities, WHO and other UN agencies and timely and consistent information distribution between different bodies at the local and the regional level has to be addressed.

Different sources of information are available in different countries; therefore, it is important to select a suitable source to convey the required messages to the community through it. In the Eastern Mediterranean Region television is the main source of information, so by selecting the most popular programmes/channels and conveying messages through it, this method could be used as a successful tool. Revision and updating of the information has to be guaranteed during the different phases of the pandemic. Medical doctors can be used to convey the right messages to the community as they are trusted among different communities.

It is very important to appoint nominated pandemic spokespersons at national and regional levels to be responsible for all media presentations to the broader community. It is preferable that those spokespersons be assigned from the Government. WHO can support Member States by providing adequate technical support at the national and regional levels for these spokespersons.

## **8. LABORATORY SURVEILLANCE**

### **8.1 Laboratory surveillance and biosafety: human**

*Dr H. Esmat, MoHP*

A definition of laboratory surveillance is important in allowing accurate identification of viruses; ensuring successful isolation of the virus in order to determine its type and subtype; detecting and identifying newly-emerging epidemic variants in a timely manner; and in the selection of appropriate vaccine strains.

As respiratory samples, oro-pharyngeal, should be collected from suspected cases with influenza symptoms as soon as symptoms begin and before the administration of medications. Multiple samples should be collected on different days if possible. Also, serological specimens should be collected, too. In this case paired serum samples are more useful than serum samples. If the results show that the concentration of avian influenza antibodies increases over time, two should be collected; acute one within seven days after the onset of the symptoms and convalescent samples after 21 days of the onset of the symptoms. No samples should be collected from contacts unless they develop influenza symptoms.

Samples collected from the field should be placed in a viral transport medium and sent to the laboratory with a form containing all relevant information; demography, clinical, etc. in addition to the method of collecting the samples. All samples should be labelled by name and identification number. Specimens should be stored at 4 °c before and during transportation within 48 hours and at -70 °c after 48 hours, the same temperature should be used to store sera specimens except after 48 hours, at which time it should be stored at -20 °c.

Methods to test for avian influenza respiratory samples include: PCR, virus isolation, rapid detection test and immunofluorescence, while blood sera is used to measure specific antibodies. PCR and cell culture are the most commonly used method.

It is important to follow up on all WHO regulations and guidelines regarding biosafety measures during collection, storing, transporting and disposal of samples. Biosecurity level 2 laboratory with biosecurity level 3 practices should be used when diluting specimens, nucleic acid extractions and diagnostic testing that does not involve culturing of avian influenza virus, while biosecurity level 3 laboratory and biosecurity level 3 practices should be used when culturing avian influenza virus.

A specimen tracking system should be in place, where all the relevant information should be saved in with the results of the tests. The data can be used to produce reports to be shared with local health officials and with the WHO global influenza programme.

### *Discussions*

Laboratory identification of human influenza virus is commonly performed using rapid antigen detection, virus isolation in cell culture, immunofluorescence assay, or reverse transcriptase-polymerase chain reaction (RT-PCR). The use of rapid tests for the detection of human infections of avian influenza is in general not recommended. The clinical accuracy of rapid tests for the detection of avian influenza infections in humans is unknown, and if the test result is positive, differentiation between influenza A subtypes is not possible and confirmatory tests must be done by RT-PCR or viral culture. A negative rapid test result does not exclude human infection with avian influenza viruses. However, there are certain conditions (outbreaks/pandemic) starting with the rapid test it is possible to detect influenza A since it can provide the results in a clinically relevant time frame to complement the use for the antiviral medication for treatment and chemoprophylaxis of influenza. Positive results must be confirmed by IFA, viral culture or RT-PCR.



In general, the sensitivity of rapid tests is 70%–75% and it is lower than that of cell culture, while their specificity is high 90%–95%. Because of the low sensitivity, false negative results are a major concern with these tests.

RT-PCR is the recommended test to be conducted and IFA is recommended, too as it can be used for the detection of the virus in either clinical specimens or cell cultures. Clinical specimens, obtained as soon as possible after the onset of symptoms, are preferable as the number of infected cells present decreases during the course of infection. Performing IFA on inoculated cell cultures is preferable as it allows for the amplification of any virus present.

Serological tests available for the measurement of influenza A-specific antibody include the haemagglutination inhibition test, the enzyme immunoassay and the virus neutralization tests. The microneutralization assay is the recommended test for the measurement of highly pathogenic avian influenza A-specific antibody. As this test requires the use of live virus, its use for the detection of highly pathogenic avian influenza A-specific antibody is restricted to those laboratories with biosafety level 3 containment facilities.

According to case definition there is a difference between people under investigation with a positive or negative history of exposure, suspected and confirmed cases. Medicines should be administered to suspected and confirmed cases; however, surveillance should be strengthened for exposed cases.

Biosafety precautions are vital for laboratory work. The maximum precautions should be taken into consideration by the use of full personal protective equipment (PPE) even when collecting samples. All such efforts must be established and maintained through regular risk and threat assessments of the virus being in use, facilities, equipment and procedures used, with clear instructions on roles, responsibilities and remedial actions and regular review and updating of laboratory precautions, in order to enhance laboratory biosafety.

During the human pandemic influenza, a collection of five specimens from every new site is enough to declare the occurrence of the outbreak in such areas and to impose the containment and control measures. Testing more than five people is not recommended as resources should be saved. Coordination with the whole team including laboratory technicians is important to ensure the timely sharing of influenza viruses/specimens so monitoring and understanding the evolution of the virus will be guaranteed.

The case–fatality rate for avian influenza is very low compared to other fatal viruses. However, the treatment is usually effective when administered in the first 24 hours after the onset of the disease. However, it was not effective for some cases in Egypt because people denied having been involved in slaughtering. All the individuals except one who died from avian influenza in Egypt were female and were brought to hospitals at a late stage in their conditions, at a point at which medicines were not effective. The gender issue should be taken into consideration while addressing the community.

In order to understand the nature of the virus, it might be necessary to conduct an analysis of specimens for patients with low grade and high grade symptoms in two different laboratories and to compare the results.

Identification of each country's capacity of shipping of critical specimens from the source location to WHO reference laboratories was brought up during the meeting as a crucial issue. An agreement should be formulated on the shipping of hazardous material within and outside the countries.

## **8.2 Laboratory surveillance and biosafety: animal**

*Dr M. Mehrez, MoA*

There are different types of surveillance system that can be used for different purposes: passive surveillance for clinical suspected cases or flocks; low pathogenic avian influenza; and highly pathogenic avian influenza, active surveillance for statistically randomized sampling polices; pre-movement testing; and pre- and post-vaccination monitoring and targeted surveillance for surveillance of all poultry species at risk; and for confirmed positive cases with epidemiological links.

Biohazardous material and its impact on human and animal health and the environment focuses on the importance of implementing biosafety measurements by conducting a risk management process that includes identifying hazards; assessing hazards; developing controls and making risk decisions; implementing controls; and supervising and evaluating the whole process with some recommended precautions in dealing with the virus in different phases, in order to protect personnel from exposure to infectious agents; to prevent environmental contamination; and to maintain safe work places. The recommended precautions required to implement, in order to prevent the spread of the avian influenza virus, are the use of biosecurity level 2 practices and facilities when receiving and inoculating routine laboratory diagnostic specimens, dealing with necropsy material and during the production of large amount or vaccines activities; and the full use of PPE.

Standard laboratory and operation procedures are crucial for virus diagnosis, in addition to the implementation of a comprehensive quality assurance and control programmes. Various tests are available to test for avian influenza in poultry which are virus isolation, Rt-PCR and rRT-PCR and antigen culture ELISA for virus detection; agar gel immunodiffusion (AGID) test; and enzyme-linked immunosorbent assay (ELISA) for antibody detection in all subtypes; and hemagglutination-inhibition (HI) test; and neuraminidase-inhibition (NI) tests for antibody detection in H and N subtypes.

The avian influenza surveillance system in poultry started in Egypt in 2003, efforts to include the migratory birds' flyways; random and condensed poultry farms; backyard and rooftops; and live bird markets, in addition to the implementation of required biosecurity measures are ongoing. From its implementation until February 2006, 32 830 birds, including 16 205 wild birds, were tested. The results show that avian influenza isolated from the wild

birds was H7, H7N7 and H6N2 and the results were confirmed in the (OIE) reference laboratory.

### *Discussions*

The majority of avian influenza poultry infected cases reported during 2006 and 2007 were from backyards, while the number decreased in farms because of the compliance with the vaccination programme. Vaccine failures have been reported in some cases, however, factors other than the efficiency of the administered vaccines need to be studied. No exact figure is available on vaccine failure. False negative avian influenza cases have not been reported among poultry.

The major limitation on the use of the rapid detection test is the low sensitivity of the test. In some exceptions, rapid detection can be used to detect influenza virus type A and B in clinical specimens collected from tracheal, nasal swabs or throat swabs but not from faecal samples. This test is useful to confirm the presence of influenza A.

National plans should consider the strengthening of research, especially in the area of molecular biology so myths concerning the difference between ducks and chickens will be resolved. Also, the effect of the vaccine on birds with low and high grade of symptoms should be studied, in addition to the conduction of some field experiments in order to define the best time of vaccination, especially for broilers as a programme for vaccination and monitoring of breeders is already available for the different types of the virus. Studies to improve the efficiency of human vaccines should always be addressed. In the case of Pakistan, human vaccines are not being revised and updated; therefore, a significant proportion of vaccine failure resulted from the administration of these viruses.

The national strategy to contain the disease has to seriously take into consideration the strengthening of veterinary surveillance to test for poultry with no symptoms before slaughtering and to monitor imported and wild birds and vaccination of the backyards in order to reduce the possibility of the spread of the virus to human infection. In the case of Jordan backyard flocks are being vaccinated and monitored by the Ministry of Agriculture.

### **8.3 IATA regulations of specimen packaging and shipment**

*Dr H. Esmat, MoHP*

Packing instruction 602 is specific for a category A specimen, which is an infectious substance and any exposure to it is capable of causing permanent disability, life-threatening or fatal disease to humans or animals; packing instruction 650 is specific for diagnostic specimens, category B, which is an infectious substance and does not meet the inclusion criteria of category A specimen; and patient specimens, that has a minimal likelihood of the presence of pathogens, are not subject to these regulations, as long as the specimen is transported in a certain packaging that prevents any leakage and the specimen is marked with "Exempt human or exempt animal specimen".

A triple packing system should be used in packing any specimen of the three categories for transportation. Also, rigid outer packaging should be used for category A and B specimens. In addition, a drop test should be carried out from a height of 9 metres for a category A specimen and from a height of 1.5 metres for a category B specimen.

An itemized list of contents in a sealed plastic bag should be placed between the secondary container and the outer packaging. All specimen data forms, letters and other types of information that identify or describe the specimen and identify the shipper and receiver, and any other documentation required must also be provided during the transportation of specimens.

A new law that came into effect in February 2006 increases civil hazardous materials penalties to a maximum amount of US\$ 50 000 and a minimum amount of US\$ 250 unless the penalty is training related. In that case the minimum amount would be US\$ 450 per violation per day. If the violation results in death, serious illness or severe injury to any person or substantial property damage then the penalty can be increased to a maximum amount of US\$ 100 000 per violation.

### *Discussions*

Shipments take place not only between countries but also within countries. Triple packaging is the standard procedure whether within or between countries. Countries face real difficulties in shipping hazardous material. Therefore, countries have to be prepared ahead of time and to form agreements with different transportation companies and airlines in charge of shipping specimens within and between countries. WHO should intervene to ease the formulation of such agreements.

## **8.4 Waste disposal of biologically hazardous material: challenges**

*Dr A. Abdulzaher, MoA*

Biohazards are infectious agents that present a direct or indirect potential risk to the health of humans, animals or the environment. Many biohazard material related to avian influenza can be available either in the field, such as birds, manures, infected food, poultry products and infected primacies, or in the laboratory such as cloacal and tracheal swaps, tissue, blood, laboratory test products and contaminated PPE. Many effective methods are available to dispose of wastes, such as burial, disposal in a pit, incineration, rendering, composting and on-farm freezing.

Manure and infected food can be disposed of by using burial on the farm or incineration or composting methods after disinfection. Eggs can be disposed of by using burial on the farm or burning methods after being disinfected. Contaminated PPE can be either autoclaved or incinerated. Each five swaps have to be pooled in sterile screw-capped vials under a laminar flow cabinet and then autoclaved. Pathology tissue samples are taken under laminar cabinet with all biosafety measures, while the remaining tissue needs to be autoclaved or burned. Syringes disposed of in sharp containers, serum disposed in screw-capped tubes

under a laminar flow cabinet and the remaining blood should be collected and autoclaved. All the autoclaved materials are then collected by a certain company for burial.

Birds should be disinfected before dealing with them. In the case of live birds, cervical dislocation is supposed to be used for depopulation of birds. Disinfected birds are then collected in an autoclave bag to be autoclaved and buried. The infected primacies should be washed with water and soap then disinfected with suitable disinfectant and the contaminated areas fumigated.

## **9. INFECTION CONTROL: GUIDELINES AND PRACTICES**

### **9.1 Principles of infection control**

*Dr Z. Memish, GLL, King Abdulaziz Medical City*

The updated WHO interim infection control guideline (May 2007) for health care facilities on avian influenza, including avian influenza H5N1, May 2007, differ from the guideline of April 2006, in the application of droplet precautions instead of airborne precautions when providing routine patient care while the use of airborne precautions whenever performing aerosol generating procedure. In addition to information on WHO interim infection prevention and control guidelines for acute respiratory diseases in health care, including epidemic- and pandemic-prone respiratory diseases, in which the main recommendations stated that standard precautions should be applied routinely in all health care settings when providing care for all patients; standard and droplet. Precautions should be practised when caring for patients with acute severe febrile respiratory diseases; contact precautions may be needed and should be implemented as soon as possible in paediatric patients with acute respiratory diseases, when clinical symptoms and signs indicate a specific diagnosis (e.g., croup for para-influenza, acute bronchitis for RSV); and airborne and contact precautions should be added if the patient has a history suggestive of acquiring an acute respiratory disease caused by a novel pathogen with epidemic/pandemic potential.

The route of transmission of avian influenza from human to human is probable by droplet while it is unknown whether it can be occurred by airborne. Transmission of avian influenza from birds to human can occur by direct and indirect contacts.

The main precautions to be implemented when dealing with suspected or confirmed cases of avian influenza are: placing the patient in a negative air pressure room; creating a negative air pressure room; opening windows in isolation areas and keeping doors closed as an alternative if air conditioning is not available; placing patients in rooms alone; limiting the number of health care workers, family members and visitors; designating experienced staff to provide care; and limiting designated staff to provide avian influenza patient care. The proper use and components of PPE with normal and limited resources, methods of wearing and removing them, the duration of their usage and the specific items to be used when dealing with suspected or confirmed avian influenza cases.

### *Discussions*

Health workers tend not to follow infection control precautions. The compliance with these basic precautions should be emphasized in all health care facilities at all times and not only during the handling of avian influenza case as they are the keystone to prevent transmission of communicable diseases.

The use of the PPE should take place in all phases of infection; facial protection and hand hygiene are the most critical elements to be used when providing care for patients with acute respiratory illness, while full barrier precautions should be used when working in direct contact with suspected or confirmed avian influenza-infected patients, even during taking, collecting or transporting clinical specimens in order to minimize the possibility of exposure.

Reuse of disposable PPE items should be avoided as it may increase the potential for contamination; however, if a sufficient supply of PPE items is not available, health care facilities may consider reuse of some disposable items only as an urgent, temporary solution and only if the item has not been noticeably soiled or damaged.

There is not enough knowledge/information on all the routes of transmission, including the role of the eye as a route of transmission.

Infection control infrastructure is not available in resource-poor countries and considerable time is needed to train health care workers on infection control precautions. It is important to be prepared ahead of time on this issue and accordingly the response will be appropriate at the different levels. Including an infection control in health settings course in all the medical schools should be taken into consideration as a step forward.

## **10. VETERINARY ACTIVITIES**

### **10.1 Global and regional epidemiological situation of avian influenza**

*Dr D. Tabbaa, Faculty of Veterinary Medicine*

Table 1 shows data compiled by the Food and Agriculture Organization of the United Nations (FAO) from different sources on the occurrence of H5 and H5N1 bird cases that were reported from 26 September 2006 to 26 March 2007. H5 cases reported during the same period are represented for countries where N subtype characterization is not being performed for secondary cases or if laboratory results are still pending.

**Table 1. Total number of H5 and H5N1 bird cases reported from 26 September 2006 to 26 March 2007 per country per month**

	September 2006	October 2006	November 2006	December 2006	January 2007	February 2007	March 2007	Total
United Kingdom	0	0	0	0	1	0	0	1
Cote'd Ivoire	0	0	1	0	0	0	0	1
Nigeria	0	1	1	2	3	22	0	29
Hungary	0	0	0	0	1	0	0	1
Russian Federation	0	0	0	0	2	7	1	10
Turkey	0	0	0	0	0	4	0	4
Egypt	1	0	0	0	1	12	0	14
Kuwait	0	0	0	0	0	1	2	3
Afghanistan	0	0	0	0	0	0	3	3
Pakistan	0	0	0	0	0	1	2	3
Bangladesh	0	0	0	0	0	0	2	2
Myanmar	0	0	0	0	0	0	1	1
Thailand	0	0	0	0	3	2	1	6
Viet Nam	0	0	0	0	1	5	2	8
Lao PDR	0	0	0	0	0	1	1	2
China	1	0	0	0	0	0	3	4
Republic of Korea	0	0	0	1	0	0	1	2
Japan	0	0	0	0	3	0	0	3
Total	2	1	2	3	15	55	19	97

## 10.2 Use of multiple measures for detection and control of HPAI in poultry

*Dr D. Tabbaa, Faculty of Veterinary Medicine*

The outbreak of highly pathogenic avian influenza (HPAI) occurred in developing countries because of the available inefficient veterinary infrastructure and diagnostic system that resulted in the culling of millions of infected poultry. In order to control HPAI a comprehensive programme should be implemented that includes the administration of a vaccination component of commercial and backyards' flocks; implementation and follow-up of biosecurity measures; monitoring the evolution of the infection through the strengthening of the surveillance system that should keep track on live birds in markets; commercial flocks and backyard flocks. In addition, imported, wild and pet birds should be monitored; and using AGID, ELISA, RT-PCR or serology tests to confirm the presence of the virus.

The detection of field exposure in vaccinated flocks can be achieved by using conventional inactivated vaccines and recombinant vector vaccines through the vaccination programme. Also, the differentiating infected from vaccinated animals (DIVA) system that

was developed to support the eradication programmes in the presence of several introductions of low pathogenic avian influenza (LPAI) viruses of the H7 subtype enables the detection of antibodies to the neuraminidase antigen of the field virus.

Inadequate vaccination practices can lead to the transmission of the infection between flocks and would affect human health as vaccinated birds shed less active virus and tend not to show any clinical signs of disease and could therefore act as silent carriers. Biosecurity measures should be followed strictly in order to prevent the spread of the disease. In addition, eliminating insects and mice; depopulating flock and destroying carcasses; removing manure down to bare concrete; and using high pressure spray to clean equipment and surfaces are other good measures to be implemented.

### *Discussions*

The possibility of other viruses, such as H9 transferring to high pathogenic virus is very weak as H9 virus is distributed worldwide and has existed for more than 10 years. H9N2 is also prevalent in different parts of the Region. Poultry owners are legally importing the vaccine and the virus has no mean to infect humans. Scientifically, there is good evidence that one strain at one time could mutate and transfer to highly pathogenic virus but not more than one strain. Any influenza virus that crosses the suspicion barrier is potentially a serious threat and at this point of time the H5N1 is the only candidate virus to become highly pathogenic.

The primary goal of having animal and bird surveillance is to detect and identify newly-emerging epidemic variants in a timely manner and to contribute to the selection of appropriate vaccine strains. It also complements human surveillance. Diagnostic laboratories form the basis for the successful surveillance of respiratory viruses and other infectious diseases. The clinical specimens taken from animals are an important source of data for surveillance. Every laboratory receiving clinical specimens for the diagnosis of virus infections should maintain well-established laboratory methods which allow for the accurate identification of viruses expected to be in these specimens. The methods should be based on standardized reagents. Local production of these reagents must be addressed in each country. Having a good surveillance system and diagnostic network enables sharing of information needed to characterize risk, prevent disease spread and enhance subregional and regional control efforts.

The etiology of avian influenza virus stated that a low pathogenic strain can evolve to a high pathogenic strain, therefore this has to be addressed and the subtypes of the influenza virus have to be monitored out. Strengthening the capacity of the laboratory is one crucial issue to be addressed in the Region in order to be able to monitor the new emerging viruses.

Although effective surveillance and diagnosis are critical to the control of HPAI, the control and elimination of the virus is highly dependent on rapid and effective response activities, that would result in a fewer number of birds have to be culled. These activities include rapid destruction of infected poultry and poultry at high risk of infection; disposal of



carcasses and potentially infected material in a biosecure method; enhanced biosecurity at poultry farms and associated properties, including movement of personnel; control of movement of birds and products that may contain the virus; introduction of changes to the industry practices to reduce risk and enforce the use of vaccination. In the case of the Syrian Arab Republic, the poultry market was closed completely, and the movement of poultry from town to town was restricted. The decision was made after that for the poultry owners to conduct technical slaughtering and then the market was restructured becoming a modern market with high technology, located out of town and slaughtering is performed in these markets.

Each country must have a defined vaccination policy that is implemented under the control of official veterinary services and meets relevant international guidelines. An evaluation of the use of this policy must be carried out regularly based on key elements including the type, quality and source of vaccines permitted for use; vaccination protocols including species vaccinated, frequency of vaccination and biosecurity measures used to separate vaccinated and unvaccinated populations; operational systems to identify vaccinated flocks; system for monitoring the implementation of the vaccine policy, including efficacy of vaccination, the need for the continuing use of vaccination and detection of a field virus in vaccinated flocks. Coordination among veterinarians, laboratory technicians and epidemiologists should be ensured.

Appropriate vaccination to prevent an outbreak avian influenza is approximately 80%. The currently available vaccine is H5N2. This vaccine is very expensive and prevents the outbreak of avian influenza by 60%–80% depending on many factors other than the administration of the vaccine. The recommended vaccine is H2N1, which is not a live virus and does not contaminate the environment.

## **11. THE JOHARI WINDOWS EXERCISE**

*Dr L. Opoka, WHO/EMRO*

The Johari window is an excellent model to understand the role of self-disclosure and feedback in developing more open behaviour. The objective of the Johari exercise is to map out the kind of problems and misunderstandings that may arise among specialists; identify the determinants of these problems and misunderstandings; and propose solutions to improve collaboration between the two groups.

The Johari exercise consists of four windows, where the first row is the free activity area that includes things that are known to each specialist and the second row is the blind area in which things that each specialist holds about the other specialist have to be filled in. The two rows are broken down into two columns, where the left column is the avoided or hidden area, in which each specialty's thoughts about the other specialty and finds it difficult to say openly have to be filled in and the right column is the unknown activity area that includes questions that each specialty have and possibly none of them know the answers to.

## **12. INTRODUCTION TO THE INTERNATIONAL HEALTH REGULATIONS (IHR) 2005**

*Dr H. El Bushra, WHO/EMRO*

The International Health Regulations (IHR) are an international legal instrument which is legally binding on all WHO Member States which have not rejected them and on all non-Member States of WHO that have agreed to be bound by them. The purpose of the IHR, adopted in 1969, is to ensure maximum security against the international spread of diseases.

The IHR 1969 have many limitations, in that they are limited to the notification and response to cases of cholera, plague and yellow fever only; lack mechanisms for collaboration between WHO and countries to prevent disease spread; and depend on each country's notification, where some unwarranted and damaging travel and trade restrictions have led to reluctance by some countries to promptly report disease outbreaks and other events.

In the early 1990s, the resurgence of some well-known epidemics, such as cholera in parts of South America, plague in India and the emergence of new infectious agents such as Ebola haemorrhagic fever, resulted in a resolution at the 48th World Health Assembly (WHA) in 1995 calling for the revision of the Regulations. In May 2001, the WHA adopted the global health security resolution, stated that epidemic alert and response, in which WHO was called upon to support its Member States in identifying, verifying and responding to public health emergencies of international concern. In May 2003, resolution revision of the IHR established an intergovernmental working group open to all Member States to review and recommend a draft revision of the IHR for consideration by the WHA. The WHA adopted the IHR (2005) on 23 May 2005.

The IHR (2005) are the world's first legally binding agreement in the fight against public health emergencies of international concern such as those caused by new and re-emerging diseases with epidemic potential, as well as those associated with acute chemical or radio-nuclear events.

The IHR (2005) broaden the scope of notification from cases of cholera, plague and yellow fever to all events which may constitute public health emergencies of international concern and the reporting of other serious international health risks, irrespective of origin or source. Also, it require States to notify WHO of all events that may constitute a public health emergency of international concern and to respond to requests for verification of information regarding such events. This will enable WHO to ensure appropriate technical collaboration for effective protection of such emergencies and, under certain defined circumstances, inform other States of the public health risks that merit action on their part.

### *Discussions*

The Regulations include some articles related to shipping of hazardous materials. Some countries propose that a new rule to enforce some transportation companies and international

airlines to ease the shipping of hazardous materials should be in place and WHO should involve and provide health assistance in implementing the Regulations related to shipping. Human rights are part of these regulations where human passengers should be respected and not be forced to fly on airlines that carry hazardous specimens.

Some countries have raised concern over whether governments are aware of the IHR, how keen are they to impose them in their own respective countries and if there is any need to evaluate the implementation of IHR and the problems related to them. WHO has been working on the Regulations since 1999 and the new Regulations (2005) that will be enforced on 15 June, have been agreed and approved among countries in the Region. However, the implementation of these Regulations might be hindered because of the political concerns of some countries.

IHR 2005 is related to health problems of international, not local, concern. For example, if patients with malaria have resistance to chemoprophylaxis in certain countries then it is a national problem, however, if the medicines are administered to refugee patients who move from place to another, then it is a health problem with international concern as these people will be able to transmit the disease across countries.

### **13. STRESS MANAGEMENT DURING CRISIS**

*Dr I. Shaikh, WHO/EMRO*

Stress is any demand or change that the human system is required to meet and respond to, which is part of our normal life. There are different types of stress: day-to-day stress, cumulative stress, traumatic stress and vicarious trauma.

Day-to-day stress becomes distress or cumulative stress when it lasts for long period of time and occurs frequently. Traumatic stress occurs when exposed to an unexpected/sudden critical incident that is out of the range of normal experience that can deprive people of physical and mental health, and at times even of life itself. Talking, writing and counselling support can be good coping mechanisms to combat traumatic stress. Vicarious stress is the negative effects of caring about and caring for others who have been hurt.

During emergency deployment, many sources of stress exist such as, health problems; separation from family and friends, climate, food and cultural changes, workload, and security. Therefore, pre-deployment briefing, self-care during deployment by practising suitable coping mechanisms, preparation of return to work and to family after deployment and debriefing at the end of the mission could be good practices to wipe out deployment stress.

#### *Discussions*

The repeated exposure of emergency response personnel to critical incident stress does have a potentially detrimental effect on their well-being. It has also been found that the psychological well-being of emergency response personnel dealing with emergency situations

can greatly affect the overall outcome of such situations, including the prognosis of the primary victims of the event.

Any abnormal event in society should be taken into consideration and addressed by alerting the population and public health authorities. Instruments and tools to address the different personalities are available to be used, in order to develop different coping mechanisms for different personalities as a preparatory step for any crisis, while taking the different cultures into consideration. Spiritual or religious concepts can be helpful for dealing with stress for some societies.

#### **14. COMBI APPROACH**

WHO developed the Communication for Behavioural Impact (COMBI) approach to have individuals adopt and maintain healthy behaviour. COMBI is social mobilization directed at mobilizing all societal and personal influences on an individual and family, in order to prompt individual and family action since it as health education, information, education, communication, community mobilization, consumer communication techniques and market research, to have specific and precise behavioural outcomes desired in health.

This approach consists of five integrated communication action areas, which are:

- administrative mobilization and public relations to highlight healthy behaviour through the mass media;
- community mobilization, including community group meetings, partnership meetings, traditional media, distribution of leaflets, posters, pamphlets and home visits;
- advertising and promotion via radio, television, newspapers and other available media and incentives, such as free samples and small gifts, to motivate people to consider the suggested behaviour;
- personal selling and interpersonal communication at the community level, in schools and involving school children and in homes with appropriate informational literature and allowing for careful listening to people's concerns and addressing them; and
- point-of-service promotion, which emphasizing easily accessible and readily available solutions to health problems.

This approach should be used and a proper plan should be implemented at each stage of facing the risk of avian influenza.

#### **15. RECOMMENDATIONS**

##### *To Member States*

1. Map out resources at country and regional level.
2. Nominate a resource person to deal with disaster preparedness and response.
3. Establish a sensitive early warning system to detect the first signs of changes of a virus. Strengthen existing systems.

4. Establish a clear case definition for the different case categories in the surveillance system.
5. Include seasonal influenza in the system (list of notifiable diseases) and monitor strongly in order to detect unusual clusters of cases.
6. Establish a multisurveillance system for the different areas, including sentinel hospital-based surveillance for individuals with acute respiratory illness on or during admission to hospital, surveillance of unexplained deaths caused by acute respiratory illness, or of clusters of severe acute respiratory illness in the community, surveillance of unexplained deaths caused by acute respiratory illness in health care facilities or unusual mortality in commercial bird flocks or animal herds, in addition to laboratory surveillance.
7. Strengthen coordination among different health providers so as to be part of the surveillance system.
8. Allocate resources for the conducting of research in different areas, especially molecular biology.
9. Develop a communication plan that addresses different target groups. Ensure unified key messages will be conveyed to communities, materials will be distributed and the selection of suitable distribution mechanisms will reach the different target groups.
10. Nominate pandemic spokespersons at the national and regional levels, who will be responsible for all media presentations to the broader community. Adequate technical support for these spokespersons has to be ensured.
11. Provide training on avian influenza preparedness and response to medical doctors in order to be used as a tool to convey the required messages to communities since they are considered as an accredited source.
12. Address compensation mechanisms thoroughly with the local government so as to encourage the early reporting of an outbreak, especially in rural areas.
13. Impose penalties on farmers if they do not participate with the mass vaccination programmes. The presence of a strong and effective vet surveillance system can follow up these farms.

#### *Laboratories*

14. Encourage national laboratories to implement quality control measures.
15. Ensure that local laboratories should not use all available resources during outbreaks.
16. Identify a reference laboratory that should be fully equipped. It is preferable that the laboratory is managed by the government or supervised by the government. The availability of more than one reference laboratory is possible and depends on each country.

#### *Infection control*

17. Ensure the availability of the PPE in most or all PHC facilities, specimen collection sites, laboratories and reference hospitals to deal with specimens and patients.

#### *To WHO*

18. Conduct training sessions for health personnel on the surveillance system.
19. Take the lead in bringing regional coordinators, the private sector and the League of Arab States together to discuss the relevant issues.
20. Promote the preparation of national contingency preparedness plans that include guidelines on the containment and control of the pandemic at different stages.
21. Ensure that Member States are aware of the COMBI approach and technically assist them in implementing it.
22. Support countries in identifying each country's capacity of shipping of critical specimens from the source location to WHO reference laboratories. An agreement should be formulated on the shipping of hazardous material within and outside the country.
23. Recommend the use of the real time PCR that can be taken to the field for the purpose of testing and overcome the limitation of the rapid detection test.
24. Conduct a specific workshop for human and animal laboratory technicians across countries to share experiences and information on the sensitivity and specificity of certain tests for certain species and diseases and accordingly adopt a common protocol.
25. Support countries to establish regional laboratories (level 3) in order to start the local production of certain vaccines.
26. Support countries in putting infection control mechanisms in place and strictly following them.

**Annex 1****PROGRAMME****Sunday, 3 June 2007**

08:30–09:00	Registration
09:00–09:45	Opening Sessions by <ul style="list-style-type: none"> <li>• Opening Remarks Dr J. Mahjour, Director of Communicable Disease Control, WHO/EMRO</li> <li>• Introduction of the participants</li> <li>• Adoption of the programme</li> <li>• Election of officers</li> </ul>
09:45–10:00	Concept and objectives of the workshop, Dr H. El Bushra, WHO/EMRO
10:00–10:15	UN humanitarian reforms, Mr J-L. Tonglet, WFP
10:15–10:30	Disaster and humanitarian emergencies
10:30–10:45	Disasters and complex humanitarian emergencies: Global and regional perspectives, Mr A. Musani, WHO/EMRO
11:00–11:30	Plenary discussions
11:30–12:00	WHO's role in humanitarian health action/Cluster coordination, Mr A. Musani, WHO/EMRO
12:00–12:30	Plenary discussions
12:30–13:00	Humanitarian information management, Dr I. Shaikh, WHO/EMRO
13:00–13:30	Rapid health assessment, Dr I. Shaikh, WHO/EMRO
13:30–14:00	Emergency response operations, Dr I. Shaikh, WHO/EMRO
14:00–14:30	plenary discussions, presentations of the group working and discussion
14:30–16:15	GPS and MAP reading, Ms E. Abdelghaffar, WHO/EMRO
16:30–17:00	
17:00–17:30	Discussions

**Monday, 4 June 2007****Surveillance and early warning during crisis**

09:00–09:15	Surveillance in crisis, Dr I. Shaikh, WHO/EMRO
09:15–09:30	Team composition and selection, Dr N. El Tantawy, WHO/EMRO
09:30–10:00	Outbreak detection and investigation/Coordination of outbreak response, Dr L. Opoka, WHO/EMRO
10:00–10:30	Discussions
10:30–10:45	Rapid response and containment measures (AI/PI)
10:45–11:00	Avian influenza – global and regional update, Dr J. Jabbour, WHO/EMRO
11:00–11:30	Steps of rapid response and containment, Dr H. El Bushra, WHO/EMRO
11:30–12:15	Discussions

	Logistic support
12:15–12:45	Introduction to logistic support systems (LSS) Mr V. Martinez, WHO/EMRO
12:45–13:00	Discussions
	Risk communication and social mobilization
14:00–14:30	Crisis communication in human emergencies, Ms S. Bootsma
14:30–15:00	Importance of advocacy and social mobilization activities in controlling avian influenza, Dr I. Kerdany, WHO/EMRO
15:00–16:00	Discussions

**Tuesday, 5 June 2007**

	Laboratory surveillance
09:00–10:00	Laboratory surveillance and bio safety (human), Dr H. Esmat, MoH-Egypt
10:00–11:00	Laboratory surveillance and bio safety (animal), Dr M. Mehrez, MoA-Egypt
11:00–11:15	Discussions
11:30–12:00	IATA regulations of specimen packaging and shipment, Dr H. Esmat, MoH-Egypt
12:00–13:00	Waste disposal of biologically hazardous material (challenges), Dr A. Abdulzaher, MoA-Egypt
13:00–13:15	Discussions
14:15–16:15	Plenary discussion: presentations of group work and discussion

**Wednesday, 6 June 2007**

	Infection control - guidelines and practices
09:00–09:30	Principles of Infection Control, Dr Z. Memish, King Abdulaziz Medical City- Saudi Arabia
09:30–10:30	Plenary discussion
	Veterinary activities
10:45–11:15	Global and regional epidemiological situation of avian influenza, Dr D. Tabbaa, Faculty of Veterinary Medicine, Syrian Arab Republic
11:15–11:45	Use of multiple measures for detection and control of HPAI in poultry, Dr D. Tabbaa, Faculty of Veterinary Medicine, Syrian Arab Republic
13:00–15:00	Plenary discussions: presentations of group work and discussion
15:00–16:00	The Johari Windows exercise, Dr L. Opoka, WHO/EMRO
16:15–17:00	Discussions

**Thursday, 7 June 2007**

09:00–09:20	Introduction to the IHR 2005, Dr H. El Bushra, WHO/EMRO
09:20–09:40	Stress management during crises, Dr I. Shaikh, WHO/EMRO
10:00–10:30	Plenary discussion
10:30–12:00	Conclusions and recommendations: The way forward, Dr H. El Bushra, WHO/EMRO



12:00–12:30

Closing session, Dr H. El Bushra and Mr A. Musani, *WHO/EMRO*

13:30–15:30

Visit to SHOC Room/EMRO

**Annex 2**

**LIST OF PARTICIPANTS**

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Mr Altaf Musani, Regional Adviser, Emergency and Humanitarian Action, WHO/EMRO  
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## Annex 3

## OUTCOME OF WORKING GROUPS

## 1. Table 1. Preparation for an earthquake (Group 2)

Sector	Information to be collected during an earthquake	Sources of information	Reasons for collecting this information
Health	Population size Affected group and available resources in the area Functionality of health infrastructure Presence or absence of fire Standing buildings Power water, and telecom and roads and cars etc Personnel Drugs Availability of resources, electricity, syringes, OR equipment etc. the health care needs Types of injuries Types and number of injuries (short term) Timing of the health assessment Availability of the health care personnel	Site Inspections; Remote Sensing; Fly over RHA'S; Existent MOH data; and Media (with filtering)	In order to plan for the different components needed to respond; and In order to mobilize appropriate resources to help in funding and volunteer work
Shelter	What is the climate How many people are displaced What is the state of the remaining buildings Campsite availability and appropriateness Availability of other services such as short-term housing materials Security of the shelter site	Map; Google earth; Military maps; and Local community	To identify sources of temporary shelters locations
Water	Population need Storage capacity Sources of water How to keep water clean and safe Assessment of pre-existing water systems	Ministry of water and Water Authority	To draw an estimation of the needs according to international standards; and To provide the needed amount of water and to sustain availability
Food	Number of surviving population Age group Road access Temperature so as to plan for storage of food Utensils and containers Waste management Population distribution in the region of disaster	Local authorities; and MoA	To provide sufficient food; and to guarantee safe food storage

**Table 2. Preparation for an earthquake (Group 3)**

<b>Sector</b>	<b>Information to be collected during an earthquake</b>	<b>Sources of information</b>	<b>Reasons for collecting this information</b>
Health	Demographic characteristics of the population affected - Age group - No. of displaced people - No. of survivors - Main occupation Health facilities - No. of functioning hospitals and clinics Human resources - No. of functioning and needed doctors/nurses Mortality and morbidity - Number of deaths - No. of injuries (fractures, burns) - History of cholera outbreaks - History of animal or plant-associated diseases	Government offices-district level;  Department of statistics;  MoH;  NGOs functioning in the area; and  MoA	To gain an understanding of the size and magnitude of the crises;  To draw an estimation of the affected population's needs;  To provide the required health services; To put in place some preventive measures; and  To decide on the burring places.
Shelter	Season/ climate Available suitable places for accommodation such as schools, mosques, community centres Tents, covers, mattresses Topography of the area Storage and cooking facilities Security	Local authorities;  Local leaders;  Personal observations; and  Personal communication	To guarantee safe places for the displaced people
Water	Availability of drinking-water Garbage collection sites Sewage disposal treatment plant Rodent and insect control	Local authorities; Personal observations;  Personal communication	To provide the needed clean drinking-water; and To install latrines
Food	Availability of food stocks Type and habits of food related to the affected population Food storage	Agricultural department; and  Local leaders	To provide sufficient food;  To guarantee safe food storage; and  To control the incidence of foodborne diseases

## 2. Group work 2

### Preparation and strengthening laboratory surveillance (Group 1)

#### *Specimens*

Oro-pharyngeal specimens and serological specimens should be collected from living individuals. Collection kits should be used to collect the specimens. The preparation of the kit and the provision of the services should be done by the MOH. However, in countries that lack the structure of health departments; the preparation of the kits should be guaranteed by international organizations, such as WHO, and the provision of the services should be done by them, as well.

Trained health personnel will obtain the specimens. These health personnel should be trained on regular intervals. In case that the available personnel are not sufficient, other categories of population should be trained on specimens' collection. Specimens' collection should take place in pre-assigned and prepared sentinel sites that have to be addressed in each country's national plan. These sites must be safe and have enough PPE.

The disposal of waste should be handled in the waste bag that is available within the collection kit. The proper technology will be applied thereafter such as autoclave, incinerator, disinfection and burial.

In the pre-pandemic phase physicians only who will decide on specimens to be taken from suspected cases in order to catch early cases, however, in the pandemic phase the decision should be made according to the country capability and availability of services, checking of viral resistance and emergence of new strains. Five samples should be collected from each new site.

#### *Laboratories*

PCR test should be carried out for the collected specimens in the laboratories. Viral isolation for some cases at regular intervals can be done, too.

Subnational laboratory is needed for further testing. Isolation and sequencing tests can be done only in the central laboratory that should be BSL 3. Specimens should be sent to the reference laboratories at the regional and world level in order to compare results of the local laboratories.

Quality control can be assured by providing continuous training of laboratory personnel.

#### *Transportation*

Ice boxes should be used to transport the specimens. Transportation of specimens could be done by the MoH cars or by contracting out some private companies.

### *Reporting*

The director of the central laboratory should report to the Minister of Health. The results should be reported by phone and fax. The report should be prepared by doing line listing and epidemiological curve and should be submitted on a daily basis during a pandemic phase.

## **Group 2**

### *Specimens*

Oro-pharyngeal specimens (throat) specimens should be collected from living individuals, which is easier than nasopharyngeal swap. Serum specimens should be collected and tested from 5-10 cases from each new site. Collection kits should be used to collect the specimens. Money for the kits is an issue to be addressed.

Doctors and nurses will be busy during the crises. Therefore, volunteers from the different categories should be trained on the collection of specimens as it does not require high skills. Training programmes should to be designed and repeated in different place for different categories include the following: ICRC; retired medical staff; medical students; and army. Primary health care (PHC) facilities will be the place for the collection of specimens. PPE should be available in selected PHC facilities that could be managed by the different providers. The PPE should be used completely.

Training will be provided to all personnel working in this area on managing wastes and one safety officer should be hired in each collection site in order to follow up this issue.

Physicians only will decide on the collection of the specimens. Five specimens should be collected from each new site. The new site, with the first new case can be defined as a circle with a certain diameter around the place with first new case. The diameter could be of 1-3 km depending on the country.

### *Laboratory*

PCR tests should be carried out for the collected specimens.

Sub-national laboratories should be available and fully equipped and the personnel should be trained. The availability of more than one subnational laboratory is a matter that depends on some factors such as the geographical distribution of each country. The subnational laboratories could be managed by the different health providers but they should be supervised by the government.

Quality control can be assured by doing proficiency testing and the implementation of quality control measures by send all the positive specimens and a sample of the negative specimens to the reference laboratory to confirm the results. The frequency of sending specimens to the reference laboratory depends on the results.

#### *Transportation*

Ice boxes should be used to transport the specimens from the collection site to the laboratories. Ice boxes are included in the collection kits. Transportation of specimens could be done by contracting out some private companies; allocating some money for personnel transportation; using the military cars; and using the cars of the local nongovernmental organizations.

#### *Reporting*

The director of the central laboratory should report to the person assigned by the avian influenza national committee. The results should be reported by phone and fax. The report should be prepared by doing line listing.

### **3. Group work 3**

#### **Animal surveillance (Group 1)**

The samples should be sent to poultry testing laboratory but not necessarily a reference laboratory. There is no need for reporting if the results confirmed the presence of unreported poultry communicable diseases.

In order to prepare for potential pandemic influenza, each sentinel site; hospitals, clinics and laboratories has to report on the occurrence of cases with respiratory diseases, cases hospitalized in the intensive care units with respiratory diseases.

If the preliminary results of the laboratory tests indicate the presence of an H5 influenza virus, the results should be reported to the MoA and other local organizations involved in the monitoring of avian influenza. If the final results confirm the presence of H5N1, it should be reported to the avian influenza national committee, official channels and other international organizations but not to be reported to the public. The measures that should be taken after that are strengthening surveillance, quarantine, culling the birds in the farms that are located around the infected farm in a circle with 3 km radius, vaccinating poultry in the farms that are located in a circle with a radius between 3-10 km around the infected one and ensuring that all bio-security measures are in place and vaccination.

The suspicion of having human cases of avian influenza and the decision to start the collection of respiratory specimens for testing should be associated with some factors such as the occurrence of human cases in an area that has already infected with avian influenza; the occurrence of human cases after being in contact with poultry; and the occurrence of clusters of severe respiratory infection of unknown etiology.

## **Group 2**

Animal laboratories should be separated from human laboratories; however, there is no problem from having them together as long as both of them are following the bio-safety measures and appropriate precautions. If a high pathogenic virus is under suspicion; samples should be sent to an approved governmental animal laboratory. Sending the samples to two different vet laboratories for confirmation, would be good if the country has this capacity. According to the case definition of each virus/diseases and the country regulations related to this matter, the decision will be made on whether to report on the results of the laboratory tests.

In order to prepare for potential pandemic influenza, the seasonal influenza disease has to be included in the communicable diseases surveillance system. Each health facility has to report on unusual deaths related to respiratory infection.

If the preliminary results of the laboratory tests indicate the presence of an H5 influenza virus, the results should be reported to the MoA, MoH and some of the international organizations such as WHO and FAO. If the final results confirm the presence of H5N1, it should be reported to the avian influenza national committee, WHO and FAO. The farm owner and the referring veterinarian have to implement self-quarantine, culling the birds in the farms that are located around the infected farm in a circle with 3 km radius, vaccinating poultry in the farms that are located in a circle with a radius between 3-10 km around the infected one and ensuring that all bio-security measures are in place. The surveillance system should be strengthened in all the health facilities and the poultry contacts should be followed up.

The suspicion of having human cases of avian influenza and the decision to start the collection of respiratory specimens for testing depends on the case definition of the virus and accordingly the implementation of the preparedness plan should be enforced and monitored, in order to be able to contain the virus. Shortages of resources and the panic in the community would be foreseen problems in conducting surveillance for potential human cases of avian influenza.

#### 4. The Johari window exercise

##### Physicians/epidemiologists and laboratory technicians

Johari Windows	Causes identified through each specialist	Recommendations
Free activities	<p>Laboratory technicians and physicians/epidemiologists agreed that:</p> <p>the laboratory is quite needed in order to confirm diagnosis;</p> <p>the laboratory can lead epidemiologists on how to prove evidence;</p> <p>margin of errors is accepted in both specialists;</p> <p>time and some background information are crucial for both specialties' type of work;</p> <p>the validity and reliability of the information is a major concern for both of them;</p> <p>both of them are key elements in a strong and effective surveillance system and they can propose ways to strengthen weak system.</p>	
Blind spot	<p>Physicians/epidemiologists:</p> <p>usually do not give laboratory technicians adequate background information;</p> <p>they are not able to take specimens;</p> <p>they look only for numbers;</p> <p>they do not appreciate laboratory technicians' work.</p> <p>Laboratory technicians think that physicians/epidemiologists</p> <p>the most critical information is not filled in the forms sent by them;</p> <p>do not tell them that a sample is a red flag;</p> <p>do not trust them; and</p> <p>give them a secondary role</p> <p>Physicians/ epidemiologists think that laboratory technicians</p> <p>do not send the results on time;</p> <p>throw out specimens;</p> <p>obtain bad results because of their inappropriate way of collecting sample; and</p>	<p>The laboratory forms should be prepared together and agreed between them on the needed information that should be filled in;</p> <p>The forms should be made available and widely disseminated;</p> <p>Appropriate information should be sent by clinicians to laboratory technicians;</p> <p>Laboratory technicians should disseminate some guidelines on samples' collection and time needed to obtain test results.</p>
The hidden	<p>do not tell them that a sample is a red flag;</p> <p>do not trust them; and</p> <p>give them a secondary role</p> <p>Physicians/ epidemiologists think that laboratory technicians</p> <p>do not send the results on time;</p> <p>throw out specimens;</p> <p>obtain bad results because of their inappropriate way of collecting sample; and</p> <p>samples marked with red flag are not a priority for laboratory technicians.</p> <p>Laboratory technicians think that physicians/epidemiologists:</p> <p>are using them as a tool to have certain results;</p> <p>technicians dealing with samples;</p> <p>lack basic information on laboratory tests.</p>	<p>Coordination among the different specialties; and</p> <p>Better communication is very important to build trust and to understand the nature of each specialty's work.</p>



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<b>Johari Windows</b>	<b>Causes identified through each specialist</b>	<b>Recommendations</b>
The unknown	Laboratory technicians and physicians/epidemiologists agreed that they: need to think out of the box; have to be involved in decision-making; need to discuss the problems in their current communication approach; and need to keep each other updated on every new development in their field.	Having regular meetings to discuss constraints and to improve weaknesses.

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