

Report on the

**Intercountry meeting on Human Pandemic
Influenza: establishment/strengthening and
alternative strategies for surveillance and
response in the Eastern Mediterranean Region**

Cairo, Egypt
27–29 April 2010



**World Health
Organization**

Regional Office for the Eastern Mediterranean

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1. INTRODUCTION

An intercountry meeting on human pandemic was organized by the World Health Organization (WHO) Regional Office for the Eastern Mediterranean from 27 to 29 April 2010. Representatives from national health authorities at the policy- and decision-making levels from all Member States, Directors of Communicable Disease Control Departments in charge of the response to the pandemic, representatives from United Nations agencies and the US Centers for Disease Control (CDC) and Prevention, Atlanta, and staff from WHO headquarters also attended the meeting.

The objectives of the meeting were to:

- review the implementation of appropriate influenza surveillance at different levels of the system;
- review existing laboratory capacity for virological monitoring of influenza viruses;
- review data-sharing and the transparency of different aspects/issues related to pandemic (H1N1) 2009; and
- update Member States on interim guidance documents related to the pandemic developed through regional consultations.

The opening remarks of Dr Gezairy, WHO Regional Director for the Eastern Mediterranean, were delivered by Dr Jaouad Mahjour, Director of Communicable Diseases, WHO Regional Office for the Eastern Mediterranean. Dr Gezairy said that it had been one year since the pandemic (H1N1) influenza virus was first detected. Early on, it had been noticed that this novel H1N1 influenza virus deviated from influenza's usual pattern of activity in striking ways. In the months that followed, the virus caused a global pandemic. While the pandemic never became as deadly as was initially feared, it was not as mild as some experts now believe. Furthermore, it exposed some serious shortcomings in the public health response.

In the Eastern Mediterranean Region, the virus struck at a time when it was diminishing in other Regions in the world, especially in countries in the southern hemisphere. This provided a chance to benefit from the experience of these countries, which faced an escalating pattern and enabled a characterization of the course of the pandemic, to define its impact and to surmise predictions about its future.

Dr Gezairy said that the WHO Regional Office for the Eastern Mediterranean had worked closely with Member States to respond efficiently to the pandemic. Despite all the efforts, there were many unanswered questions about the virus. Moreover, countries in the Region had been faced by certain challenges related to surveillance of pandemic influenza, the preparedness of the health system capacity to respond, and inadequacy of financial resources. Therefore, reviewing the countries preparedness level and different aspects of the response would be of help in the identification of the main challenges and lessons learned and making recommendations on

how to be better prepared to respond effectively to future pandemics and large-scale global public health events.

The Chair was shared on a rotating basis. The programme and list of participants are included as Annexes 1 and 2, respectively.

2. OVERVIEW OF PANDEMIC (H1N1) 2009 IN THE EASTERN MEDITERRANEAN REGION

The pandemic (H1N1) virus strain is the predominant influenza strain in the Region. The Islamic Republic of Iran reported the circulation of influenza B virus in February 2010. No information is available on the circulation of other viruses, such as seasonal H3N2 and seasonal H1N1, in the Region.

The first pandemic (H1N1) cases were detected in the United Arab Emirates and Kuwait in May 2009. Sudan and Djibouti were the last countries to report cases in the Region. So far, 20 out of the 22 countries have reported 1059 deaths during the week from 22 to 28 February. Djibouti and Somalia were the only countries that have not reported any pandemic H1N1-related deaths (Table 1).

The ascending phase of the pandemic started in the last week of October 2009 with regional transmission of pandemic influenza. This indicated an early start to the influenza season. Most of the countries experienced the peak of the epidemic during late December 2009 and the beginning of January 2010.

The transmission of pandemic influenza was geographically widespread. A general decreasing trend of pandemic H1N1 activities started after mid January in most countries, with a gradual move to regional and localized transmission of pandemic influenza. The pandemic reached its lowest level in late February–March, except in Afghanistan, Iraq and Oman. The pandemic reached its lowest level in these countries in late March. In all countries in the Region, the overall intensity of the pandemic ranged from low to moderate. Reports received from countries indicated that the overall impact of the pandemic on the health system also ranged from low to moderate.

Table 1. Distribution of deaths from pandemic (H1N1) 2009, by country*22 to 28 February 2009

Country	Cumulative number of laboratory-confirmed deaths
Afghanistan	17
Bahrain	8
Djibouti	0
Egypt	277
Iraq	42
Islamic Republic of Iran	147
Jordan	19
Kuwait	30
Lebanon	8
Libyan Arab Jamahiriya	1
Morocco	64
Oman	32
Pakistan	29
Occupied Palestinian territory	43
Qatar	10
Saudi Arabia	128
Somalia	0
Sudan	5
Syrian Arab Republic	138
Tunisia	24
United Arab Emirates	6
Yemen	31
Total	1059

* The reported number of fatal cases is an under-representation of the actual numbers as many deaths are never tested or recognized as influenza-related.

Specimens shared with WHO collaborating centres for further characterization showed that the virus was genetically and antigenically similar to the pandemic (H1N1) vaccine strain and remains sensitive to the antiviral oseltamivir (Tamiflu) and zanamivir (Relenza). One case resistant to oseltamivir but sensitive to zanamivir was detected in Yemen in December 2009.

The clinical presentations of the disease in cases detected in the Region were the same as those detected globally; varying from mild symptoms in the majority of cases to occasional severe manifestation and viral pneumonia. Groups at increased risk for severe disease were the same as those identified globally. According to the analyses of the same set of data of the first 500 infected cases in the Region, 8% of the infected population were among the at-risk groups.

About 60% of clinical infection occurred in children and teenagers, while 5% of clinical infection occurred in those 50 years and older (Figure 1).

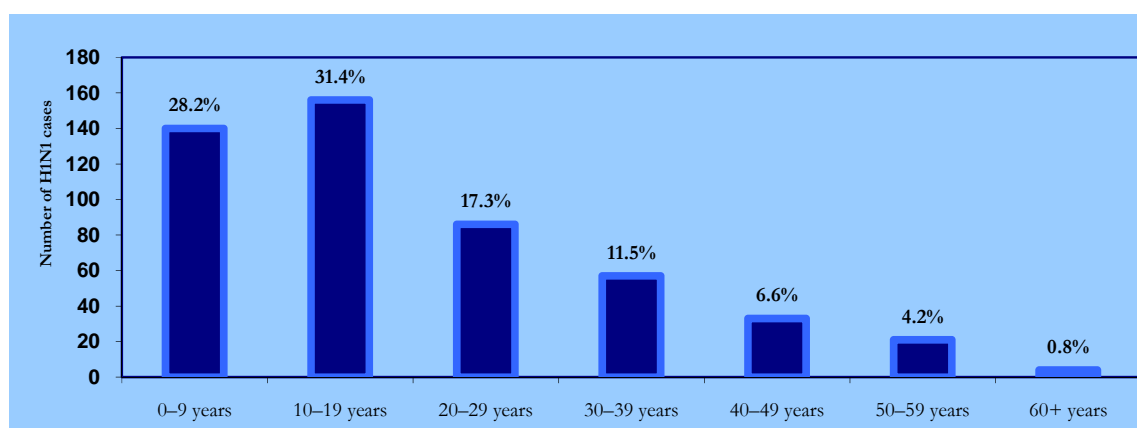


Figure 1. Rates of clinical infection among different age groups

3. INTERNATIONAL HEALTH REGULATIONS (IHR 2005) UNDER THE PANDEMIC

On 25 April, 2009, the WHO Director-General, upon the advice of the IHR Emergency Committee, declared that the pandemic (H1N1) virus outbreak constituted a Public Health Emergency of International Concern (PHEIC) under the IHR 2005.¹ Following the declaration of a PHEIC, the Director-General recommended that all countries intensify surveillance for unusual

¹ WHO, Statement by the WHO Director-General on pandemic (H1N1), April 25, 2009, available at http://www.who.int/mediacentre/news/statements/2009/h1n1_20090425/en/index.html.

outbreaks of influenza-like illness and severe pneumonia. Any travel or trade restrictions were not recommended.² This influenza outbreak marked the first time under the IHR 2005 that the Director-General convened the Emergency Committee and determined that a PHEIC existed.

On 11 June, 2009, the WHO Director-General announced that the scientific criteria for an influenza pandemic had been met with regard to pandemic (H1N1) 2009 virus, so that the WHO pandemic alert level was raised from 5 to 6.³ The Director-General recommended the continuation of the same measures related to surveillance travel and trade in addition to other two recommendations: If ill, it is prudent to delay international travel—if ill after travel seek care; and continue seasonal vaccine production for now, subject to re-evaluation.

Activities following the declaration of the PHEIC included: developing/maintaining national capacity for surveillance and response and at specified points of entry; reporting and verifying data with WHO; and a range of activities related to international travel and trade.

IHR national focal points were identified in all countries before the pandemic was declared, their terms of reference were to:

- facilitate rapid access to all necessary decision-makers;
- ensure clear mandatory coordination and communications with all relevant ministries and sectors;
- establish Standard Operating Procedures, communications channels, contacts and working arrangements;
- act rapidly for urgent events;
- coordinate through existing governmental structures;
- establish mandates in appropriate legal instrument/legislation.

The pandemic H1N1 experience, which has been a practical experience on the ground, helped in the clarification and implementation of the roles and responsibilities of these focal points, who provided the initial sources of information to WHO.

No travel or border closures or trade restrictions were recommended during the different phases of the pandemic. Activities related to surveillance and response and at specified points of entry are described in the following sections.

² Upon the advice of the IHR Emergency Committee during the second and third meetings on 27 April and 5 June 2009.

³ Dr Margaret Chan, Director-General of the World Health Organization, "World now at the start of 2009 influenza pandemic" http://www.who.int/mediacentre/news/statements/2009/h1n1_pandemic_phase6_20090611/en/index.html.

4. NATIONAL PREPAREDNESS FOR PANDEMIC (H1N1)

4.1 Coordination and communication at national level

Almost all countries in the Region have developed pandemic preparedness and response (PPR) plans. These PPR plans have been developed from the perspective of the health sector while the non-health sectors were not fully engaged in the preparedness process. Few of them have updated these plans for pandemic H1N1. However, hospital, primary health care and laboratory directorates in most countries in the Region have updated their emergency preparedness plans.

The extent to which preparedness and response level in these plans matches interventions on the ground is not fully known. However, monitoring the implementation of IHR 2005 has been conducted recently by national authorities in most countries of the Region. The result of the assessment can be applied to the level of preparedness and response to the pandemic.

Countries in the Region have established/strengthened national influenza coordinating bodies at the central level.⁴ In most countries, this body is headed by the minister of health and is constituted from representatives of the different relevant ministries and civil society. In other countries another coordinating technical body was established, which is constituted from the different health providers, nongovernmental organizations, international organizations and UN agencies working in the health field and headed by the Ministry of Health. This technical body reports to the higher coordinating body. The roles and responsibilities of these two bodies were identified as coordinating all activities related to pandemic (H1N1) at the central and peripheral levels. These bodies used to meet regularly. The frequency of such meetings depended on the situation of the pandemic in each country, where more frequent meetings used to be conducted before the detection of the first cases, during the initiation and escalating phases of the pandemic. Strong coordination between these coordinating bodies and the health cluster in countries did exist (in those countries that have a health cluster).

Pandemics may have an impact on productivity and the ability to maintain the continuity of essential services in countries. This situation calls for multisectoral coordination and information-sharing. A high level of political commitment from the health and non-health sectors did exist; however, intersectoral coordination activities were not fully identified and further implemented in most countries of the Region, which needs special advocacy activities to establish/strengthen this part of coordination. The flow of information related to patients attending outpatient clinics and inpatient awards was maintained among the different

⁴ The coordinating body had a different name in each country.

administrative levels. However, weak and insufficient information-sharing among the different sectors was an obstacle in some countries.⁵

Inter-country collaboration and coordination⁶ was not addressed by any country in the Region except by member countries of the Gulf Cooperation Council (GCC), where the GCC Health Ministers' Council had several meetings to address the unified response of the GCC.

Continuity of business plans was part of preparedness activities carried out in some countries.⁷ Other countries instructed their employees not to report to work if they had influenza-like illness but no plans were there to support the continuity of business in case a considerable proportion of absenteeism occurred.

An emergency budget was allocated by national authorities in most countries for pandemic-related activities. This budget ranged from country to country depending on the economic status of each. Other countries have been financially supported by donors. Also, financial donations ranged from between hefty and modest based on donors' interest and planned activities to respond to the pandemic.

Hotlines were established in almost all countries to provide educational messages on the pandemic: definition, signs and symptoms, how to minimize the infection and to inform people about designated health facilities to manage cases.

Effective communication with the public and the media was of vital importance to avoid conflicting messages, the ministers of health, their deputies or spokespersons were the first line of communication in conveying information on the pandemic to their communities. Other senior representatives from ministries of health were the second line of communication in later stages of the pandemic.

4.2 Health system preparedness

With the existing variations in financial and human resources in countries of the Region, the minimum level of health system preparedness for the pandemic was maintained to cope with the challenges of the pandemic. This level has increased relatively with the increased levels of

⁵ Operational roles and responsibilities for the non-health sectors were not fully specified which created weak coordination mechanism at certain levels and periods of the pandemic. In addition, intersectoral coordination activities were not specified and further implemented.

⁶ Under IHR 2005, Article 44 states that state parties shall undertake to collaborate with each other to the extent possible. Advocacy activities need to be conducted in some countries to establish and further strengthen this part of coordination.

⁷ Mainly, the GCC countries have been prepared for the economic, humanitarian and societal consequences of the pandemic at the country level. This was clearly articulated in their plans.

financial and human resources. A checklist for health system preparedness and identification of support needed has been developed by the Regional Office and shared with countries. Some countries have used this checklist to conduct the assessment and advocated for the needs. Other countries have conducted assessment using other tools. A comparison among countries in their preparedness level was not possible due to the lack of a standardized tool to conduct the assessment.

4.2.1 Provision of health services for infected cases

Health authorities designated referral hospitals and intensive care units to manage the pandemic (H1N1) cases and to maintain the provision of health services to communities. The mechanism of referral from peripheral facilities to designated facilities was identified in the contingency plans for the countries that have updated their plans and agreed upon among the different health providers during the coordination meetings. These facilities were made known to communities through hot lines and the media.

In some countries, supervisory visits were conducted by WHO staff at the country level with representatives from ministries of health who were also members of coordinating bodies to make sure that designated facilities/wards were equipped and ready to manage pandemic cases. In other countries, representatives from ministries of health were assigned the full responsibility of supervising these facilities.

4.2.2 Human resources

In some countries of the Region, as the pandemic reached its peak, national authorities declared that all critical health personnel had to report to duty and no leaves would be allowed until the emergency ended.

Capacity-building for staff involved with surveillance and response systems was mandatory. Although no assessments have been conducted to identify training needs for the different categories of health personnel in the countries, many workshops have been conducted for health care workers to increase their awareness about the virus, signs and symptoms, cases definition, sample collection and investigation, different laboratory testing, referral of cases, infection prevention and control and the different aspects of surveillance, including cases detection, confirmation, and registration and reporting. Not all health care workers had the chance to receive the training; however, case definitions of the virus were distributed to all health facilities.

Redeployment of some specialized health personnel has been put in practice in designated facilities to manage pandemic H1N1 cases. Health personnel at higher risk of complications or

death from influenza were not among those asked to care for pandemic H1N1 cases. A few countries recruited additional health personnel to cope with the situation.

Physicians with knowledge of epidemiology had been assigned responsibilities at governorate and district level to refer suspected cases, based on case definitions, to one of the designated hospitals and to inform the coordinating body about the status of the pandemic at their administrative level. These focal points were known to health workers; however, the mechanism of referral might not be comprehensively known to health care workers at the peripheral level.

4.2.3 Medical supplies, pharmaceuticals and vaccines

Designated facilities were equipped with personal protective equipment (PPE). Some stock of PPE was piled up at the central stores to replenish the stock at the health facilities. An amount of PPEs was in place as a preparedness step for avian influenza in all countries of the Region. Other amounts have been either purchased or received as donations from some international organizations or UN agencies. The total amount of stocks varied among countries, therefore, PPE have been used conservatively in some countries.

Antiviral treatment (oseltamivir) has been stockpiled in designated facilities from different sources: WHO, CDC and the World Bank in some countries. Additional stock was available at the central level to replenish peripheral stock, which varies from high to low. Previous amounts of the antiviral treatment were already stockpiled at central level as a response step to the avian influenza that emerged in 2005 in the Region. Only a few countries have some amount of antiviral treatment (zanamivir).

Medications and consumables stock monitoring system exists in most countries of the Region. Although, priorities were made to make enough stock of antibiotics and consumables available to manage cases of pandemic H1N1, replenishing the gap was not maintained regularly at the health facility level in some countries due to lack of financial resources, even with the donors' support in some countries.

Access to vaccine was a big challenge at the beginning of the pandemic. The time needed for the production of the vaccine was 5–6 months and the capacity was limited to half of the world's population. Therefore, countries had to use a stepwise approach in identifying priority groups for vaccination. This was clear in national vaccine deployment plans that were developed and shared with the Regional Office by most countries based on knowledge acquired during a training workshop conducted by the Regional Office for all the EPI managers in July 2009.

Countries faced some challenges in preparing and completing their national vaccine deployment plans, including: much uncertainty about the vaccine⁸; inability of countries to secure sufficient financial resources, as co-financing of the planned activities was required by the national authorities; competing priorities with other public health problems in many resource-poor countries; and vaccination of cohorts not normally included in national immunization programmes.

4.2.4 Medical equipment

No change has been noticed in the availability and functionality of medical equipment given different levels of resources in countries. However, the minimum level of needed medical equipment at hospital wards and intensive care units was maintained to manage the pandemic cases. This was secured by either the national authorities that allocated a special budget for pandemic-related activities or by donors.

A checklist of needed equipment in inpatient wards and intensive care units was prepared by the Regional Office and shared with countries. This list can be modified and adapted to each country's capacity. This list has the objective of identifying the basic needs in medical equipment, which should be met in order to manage pandemic cases. Few countries were able to use this checklist and to report to the Regional Office, other countries have used it without sharing it with the Regional Office. Some countries have not conducted this exercise.

4.2.5 Case management

Interim guidance was developed by the Regional Office in order to provide recommendations to countries on the clinical management of human cases infected with pandemic (H1N1) 2009 influenza virus and to standardize their national clinical management protocols for pandemic (H1N1) 2009 virus infection. The guidance included a treatment flow chart that can be used as a decision-making tree by the clinicians in exercising their clinical judgment for the treatment of pandemic cases. Guidelines on antiviral treatment have been shared with the countries, as well. These guidelines have been adapted by some countries. Other countries have developed clinical management guidelines based on regional and global guidelines. Other countries have used the regional guidelines.

⁸ What type of vaccine; how many doses; when will vaccine be delivered; whether funds will be made available; and how much?

4.2.6 Infection prevention and control

A comprehensive infection prevention and control programme exists in only a few countries. The current strategies for infection prevention and control are fragmented and are not harmonized between different programme areas. The existing infection control activities are focusing only on one or a few interventions and are not utilized in developing infection control programmes.

Infection control committees were established in hospitals in some countries quite some time ago but are not always effective. Infection control guidelines were available in some hospitals but are not always fully implemented.

These committees were activated in a few countries during the pandemic and met regularly. The roles and responsibilities of these committees were to intensify compliance and adherence with standard and droplet precautions for infection control in health personnel;⁹ ensure the availability of basic resources for infection control such as hand-hygiene supplies and PPE; to disseminate criteria for use and distribution of PPE to health care personnel and to ensure direct referral of cases arriving in the hospital to isolation area (rooms or buildings), avoiding unnecessary stops, and if needed, hospitalization.

4.3 Surveillance: early monitoring and warning

In most countries of the Region, influenza conditions are not part of the notifiable disease list. Therefore, national surveillance guidance for pandemic influenza did not exist at the beginning of the pandemic and countries had to adapt guidance documents that were produced globally. The case definitions have not been changed during the pandemic phases, however, the criteria for case definitions has been expanded to include other symptoms than those that were identified at the beginning of the pandemic. These case definitions were made available to all health facilities in each country.

Surveillance at points of entry was established in some countries at the beginning of the pandemic, where case definitions were distributed to health workers at the points of entry in addition to notification forms. Contact information of suspected persons used to be collected in order that they could be followed up. Hand sanitizers, masks and PPE were made available at points of entry, as well. In addition, thermal cameras were put in place in a few countries at the beginning of the pandemic.

⁹ The adherence to standard precautions was sometimes not granted in countries that have shortage or interruption in their water supply system.

School-based surveillance was established in a few countries providing weekly and monthly data on epidemic progress at schools and compared to community spread.

Rapid response teams that already existed in countries were strengthened by training on outbreak investigation and response. No new teams were established in countries that do not have this component in their system. In such countries, rapid response teams used to meet regularly with the surveillance officers for updating and planning.

An appropriate and effective medium for communication at each level of surveillance was instituted and maintained based on available financial resources, in order to support the function of reporting and feedback. Financial resources were made available for pandemic H1N1-related activities, however the lack of a surveillance comprehensive plan and specialized human resources needed to implement activities on the ground was of concern.

4.4 Laboratory services

The existing laboratory capacity in the Region is classified according to their ability to perform virological tests and contribute to influenza surveillance. The categories are as follows.

- Category 1: no country in the Region has a national influenza centre (NIC) serving as a regional influenza laboratory centre;
- Category 2: six countries in the Region have NICs with full service;
- Category 3: five countries that have NICs with limited service;
- Category 4: 10 countries without a NIC but with some influenza laboratory activity, particularly PCR; and
- Category 5: one country without laboratory capacity to support appropriate influenza testing.

Availability of human resources work in the laboratory field varies in wide range between countries. Lack of qualified human resources hinders the establishment of subnational centres in countries that have sufficient financial resources. Training sessions have been provided to laboratory technicians on the collection, storage, packaging and shipment of specimens from the peripheral level to the central laboratory to build their capacity.

A system and mechanism for specimen collection and transportation is available in most countries with different capacities. This varies between the commercial collection kit (Viral Transport Media (VTM)) and home-made VTM based on WHO guidelines. Almost all countries are using ice packs to transport specimens domestically. Most countries rely exclusively on MoH systems for logistical support. For sharing specimens and isolates with WHO collaborating centres only countries with World Courier service could use the WHO influenza shipment fund project. Many countries in the Region do not have such service and need an alternative method.

Few countries in the Region have computer-based inventory systems. Stocks of supplies and consumables vary between 3 months and 1 year but in some cases the availability of consumables and supplies were enough for one month only.

5. RESPONSE TO THE PANDEMIC

Monitoring the progress of the disease was the main factor in identifying response strategies for pandemic (H1N1) 2009 in the Region. Evidence-based guidelines and tools were developed at the global and regional levels and shared with countries. These guidelines and tools address the pharmaceutical and non-pharmaceutical aspects of the response to the pandemic. Given the high uncertainty level related to the pandemic, these guidelines and tools were subjected to updates as some of the uncertainties were made known by available information. Deployment of experts from the Regional Office to some countries was considered during the pandemic. Other logistical support related to the management of antiviral treatment and pandemic (H1N1) 2009 vaccine was also addressed by the Regional Office.

5.1 Health system response

During the pandemic, hospitals played a critical role within the health system in providing essential medical services. It was expected that the demand on health services would increase in a way that would potentially stretch the capacity of the health system. However, the demand on health services reached a level that was above the usual demand level but below the maximum capacity of these services.

5.1.1 Continuity of provision of health services

The provision of essential health services, such as emergency, surgical operations, mother and child health, etc. at health facilities have continued during the different phases of the pandemic with no interruption.

Some countries in the Region have electricity and water supply interruption and have partial or no system to manage medical wastes due to different factors. There has been a slight improvement to this situation. In other words, the existing mechanisms of coordination helped, to some extent, to improve problems related to the interruption of electricity and water supply in the designated health facilities. However, no improvement has been achieved in the management of medical wastes. This was very evident in low-resource countries and some middle-income countries.

The surge capacity of the health system in some countries is questionable. As it is known that the pandemic typically produces an increase in demand over a prolonged period of time which will have its great impact on the existing health systems in the Region. In reality, the

demand on health services does not exceed its maximum capacity except for the demand on outpatient visits. As reported, influxes of cases have sought health care at the outpatient departments and emergency rooms, with the majority of them with mild symptoms. Therefore, and to some extent, the level of severity of the pandemic was not high enough to show the weaknesses of existing health systems and their ability to manage an influx of cases.

Few countries have identified ways of expanding hospital in-patient capacity, including physical space, staff, supplies and processes but this was not the case in countries with limited resources. In addition, outsourcing care of non-critical patients to appropriate alternative treatment sites was implemented in some countries that could afford this alternative.

5.1.2 Clinical and bed management of pandemic (H1N1) cases

Severe cases were hospitalized in designated wards/hospitals. Home-based treatment was considered in most countries for mild cases, which constituted more than 75% of all cases. During the peak of the pandemic in some countries, early discharge of patients was considered in order to manage other potential cases. Home care management of patients not among the at-risk groups was promoted in countries that had an influx of cases attending the outpatient clinics.

Elective surgical operations were put on hold for a few weeks and referral of hospitalized patients from designated hospitals to other governmental hospitals or other hospitals managed by other health providers during the pandemic phase was considered in some countries to save resources for the potential influx of severe pandemic H1N1 cases.

5.1.3 Surveillance

Monitoring the event through media channels was very important for countries at the beginning to determine the trend of the disease globally. Surveillance capacity varied greatly among countries; therefore, monitoring the event was demonstrated through surveillance of rumours in some countries, and/or active surveillance in other countries and passive surveillance in other countries.

Based on the case definitions that have been distributed among health facilities in countries, detection of pandemic H1N1 cases in countries used to be carried out and confirmed by laboratory diagnosis. Surveillance for pandemic H1N1 has started in health facilities that are included in EWARS/DEWIS system in countries that have this system in place. This system has been later expanded to include other facilities, especially public hospitals. Active surveillance among case contacts was in place in some countries to monitor human-to-human transmission.

Case-based investigation was carried out at the early stages of the pandemic in all countries to perform detailed clinical, epidemiological and virological investigations of early cases. As the

pandemic virus became established in all countries of the Region, continuous monitoring of the epidemiological, virological and clinical picture of the pandemic was required in order to track progress, severity, impact and changes in the virus. Different reporting requirements were designed according to the different stages of the pandemic. An official letter was sent from the Regional Office addressing the national authorities at each stage of the pandemic and explaining the new reporting requirements and the purpose behind using each one of them.

Case-based investigation was required for the first 100 cases in each country. This was shared with all countries at the beginning of the pandemic. In the middle of July 2009, countries were requested to stop using the case-based reporting forms when the number of cases reached 100 and instead to use the daily aggregate reporting. This was followed by weekly aggregate reporting at the end of July. The daily and weekly forms included cumulative number of confirmed cases and deaths of pandemic H1N1, in addition to other variables for the hospitalized cases and deaths. Case-based reporting was still required for hospitalized severe cases only.

One month after, countries were requested to add the surveillance of influenza-like illness (ILI)/acute respiratory infection (ARI) and severe acute respiratory infection (SARI) to the surveillance of pandemic (H1N1) laboratory-confirmed cases as individual case counts became an increasingly inaccurate representation of the actual picture of the pandemic. Surveillance of ILI/SARI does exist in a few countries of the Region, which has been strengthened during the pandemic. Few countries have established the surveillance of ILI/ARI and SARI at hospital level and a few other countries established sentinel surveillance for ILI/ARI and SARI.

Later on, some qualitative indicators were developed and shared with countries which allowed tracking of regional and geographical spread, disease trend, prevalence, impact of the pandemic on health care services and deaths from acute respiratory disease through data supplied from different sources.

Compliance with different notification forms was a big challenge during the different phases of the pandemic. Although countries continued to collect line-listing information on laboratory-confirmed cases, the reporting requirements were either partially filled or not filled from the countries. The adherence to the reporting requirements decreased as the pandemic was moving from one phase to another. In some countries the reports were not disseminated to the public but kept at the central level for actions only.

5.1.4 Laboratory diagnosis

Preparations that have been undertaken for avian influenza were probably used for pandemic H1N1 influenza, especially for the laboratory response. Laboratory response during the pandemic was efficiently coordinated, which will have its value in strengthening surveillance

in the Region and countries have relied heavily on WHO technical leadership on laboratory diagnostic protocols, guidelines and reagent kits.

Several methods are available for the laboratory diagnosis of the influenza virus; however, given the limited laboratory capacity in most countries of the Region, RT PCR method is the one that has been used during the pandemic in all the countries that have the laboratory capacity for typing and sub-typing of influenza viruses. On the other hand, surge capacity was limited in many NICs in the Region with limited sequencing and antiviral surveillance capacity globally; and limited knowledge of growth property of vaccine re-assortants. More effort needs to be paid to strengthen cross-border collaboration and coordination.

At the beginning of the pandemic, all suspected specimens from all suspected cases were sent for laboratory confirmation. As the pandemic escalated in the Region, the confirmation of cases was restricted in some countries to cases admitted to hospitals. Restrictions have been extended in other countries, where laboratory confirmation was done only to cases admitted to intensive care units given the limited resources in these countries. Only Morocco continued to confirm all suspected cases even after that was not required.

Specimens collected from patients with ILI symptoms at the peripheral levels were managed at the central level and at subnational level in countries that have subnational laboratories with full PCR capacity. Viral isolation is undertaken only at the central level. Virus typing and subtyping were conducted on influenza isolates. The collection methods of specimens and type of swabs to be used varied among countries and this needs to be strengthened.

Although mandatory, sharing isolates with WHO collaborating centres in the United Kingdom, NAMRU-3 and CDC was undertaken by a few central laboratories or NICs available in some countries for detailed genetic and antigenic characterization, as well as antiviral resistance testing. Seed viruses for vaccine production are obtained through this process.

During the pandemic central laboratories were conducting external quality assistance and over sought PCR tests conducted at subnational laboratories that are available in a few countries. This was not the case before the pandemic, where only a few countries used to do this.

In many countries there is no specific budget itemized for influenza-related laboratory activities. Such countries rely heavily on external sources to implement laboratory-related influenza activities. In some cases these activities are not implemented due to the lack of budget.

The standard route of reporting laboratory data did not exist. The adherence to the already existing mechanisms of reporting was affected by each country's willingness to share and publish the data. Close cooperation with the military and the Food and Agriculture Organization of the

United Nations (FAO) virology laboratories was reported by the countries that have these types of laboratories.

Although computers are available in all central laboratories and NICs, laboratory information systems ranges from expensive off-the-shelf software packages to simple Excel or Access databases. During the pandemic, data was reported to the Regional Office, European Centers for Disease Control or headquarters directly. Some countries are submitting their data to FluNet at headquarters level.

5.2 Pharmaceutical interventions

5.2.1 *Pandemic (H1N1) vaccine*

High-income countries had access to the vaccine soon after its production was completed. Six low-resource countries: Afghanistan, Djibouti, Pakistan, Somalia, Sudan and Yemen, in addition to the occupied Palestinian territory, have been identified by WHO headquarters as eligible for vaccine donations. In the Region, Kuwait, Oman and Saudi Arabia were the first three countries to receive the vaccine in October 2009. This was followed by 10 other countries in November and two countries in December.¹⁰

Three of the six low-resource countries: Afghanistan, Pakistan and Sudan received the first batch of vaccines (2%) in February–April. The other three countries: Djibouti, Somalia and Yemen have not completed the prerequisite steps¹¹ to receive the vaccines. However, Yemen received a small amount of the vaccine from Saudi Arabia for *hajjis*. OPT refused to receive the vaccine after completing all the required steps as it had purchased a considerable amount of the vaccine that had not yet been used. Iraq, Djibouti and Somalia are the only three countries in the Region that have not purchased or received the vaccine. The availability of pandemic (H1N1) 2009 vaccine was granted by the private sector in Lebanon.

WHO has extended the offer of donated vaccines to other vulnerable countries in need beyond the seven originally eligible countries, based on their lack of capacity to access vaccines. Several steps need to be undertaken in advance before receiving the vaccine.

Although WHO has issued recommendations on the priority groups for vaccination, some countries have followed these recommendations but other countries have identified different

¹⁰ Countries that received the vaccine in November were: Bahrain, Egypt, Jordan, Libyan Arab Jamahiriya, and Morocco, Qatar, oPt, Syrian Arab Republic, Tunisia and Yemen. The Islamic Republic of Iran and the United Arab Emirates received the vaccine in December.

¹¹ A formal request to WHO to receive the vaccine; a letter of agreement accepting the terms and conditions of support; and to develop a national vaccine deployment plan.

groups for vaccination. Some countries had requested an amount of the vaccine that was enough for all their population while other countries requested an amount enough for 5% to 10% of their population. In both cases, all requested amount of vaccine was to be delivered in a number of shipments. Later on, and as countries received some of their vaccine batches, most of these countries had to cancel vaccine requests as people, including health care workers in the Region, declined the vaccines for various reasons.

Countries have faced many challenges related to the deployment of the vaccine due to two prime reasons: target groups for the pandemic H1N1 vaccine are different from target groups for the EPI which made the operational activities quite challenging; and rumours related to adverse events of the vaccine, which was taken strongly by the media, negatively affected the acceptance of the vaccine by the targeted population.

It is worth mentioning here that countries that had access to vaccine early were able to vaccinate the majority of the groups that was planned for in the first shipments. The other shipments of vaccine have been stockpiled. Physical space for the storage and stockpiling of these vaccines remains a problem in some countries, especially those that purchased a large quantity of the vaccine that went unused.

Vaccination campaigns have been conducted in several countries, especially for school children, *hajjis* and health care workers. The proportion of *hajjis* that have been vaccinated ranges from between 30% and 100% in the countries that had access to the vaccine, except in Yemen, where less than 1% of the *hajjis* were vaccinated.

The demand for the seasonal influenza vaccine was 40% higher in 2009 than in 2008.¹² Some inaccurate information was circulated among communities that the seasonal influenza vaccine provided cross-immunity against the pandemic H1N1 virus.

5.2.2 Antiviral treatment

Although few countries had antiviral distribution plans, most of them had followed the guidelines for treating moderate and severe cases with antiviral treatment at designated health facilities.

¹² This information was obtained from 16 countries in the Region through a questionnaire that was developed and distributed to countries in March 2010.

5.3 Non-pharmaceutical interventions

Implementation of non-pharmaceutical interventions had its role in delaying the rapid increase in cases in order to buy time for the implementation of the other pharmaceutical interventions; decreasing the number of cases in order to avoid overloading health systems resources; and reducing the total number of influenza cases, which reduce morbidity and mortality.

5.3.1 Individual and household measures

IEC materials were developed at the regional level and adapted by some countries. Many countries have developed and widely distributed IEC material that focuses on self-hygiene; respiratory etiquette; and home care for mildly-ill people. The educational and financial backgrounds of individuals affected their compliance to these measures.

5.3.2 Societal and community level measures

A risk communication strategy was developed at the regional level and adapted by some countries in the Region. However, some aspects were not fully covered in this strategy, such as: vaccine deployment and the adverse events of the vaccine; communication with the media; reputation management; and conflict of interest, which create gaps in the response process.

Community health education and promotion campaigns were conducted by many countries in the Region to increase the level of community awareness of the preventive measures against pandemic (H1N1) 2009.

WHO developed guidelines for the health education setting, where pre-emptive closure of school setting was not recommended. Proactive and selective suspension and closure of school settings was recommended for specific conditions. Only a few countries in the Region followed these guidelines while other countries developed their own national guidelines. No written guidelines were available in a few countries but decisions were made by the coordinating bodies and disseminated through the existing communication channels. Pre-emptive closure of schools was implemented in the educational settings in almost all countries in the Region for about one month at the beginning of the scholastic year. Other proactive closure or suspension measures were implemented in the school settings during the first semester of the scholastic year. Other protective measures were taken in school settings, such as the distribution of hygiene materials, conducting of health education sessions for students and parents and increasing space between students in classrooms. The implementation of comprehensive measures varied among countries based on available resources.

WHO developed guidelines that outlined key planning considerations for organizers of mass gatherings in the context of pandemic (H1N1) 2009 that have been adapted by some countries in the Region. Concerned countries (Saudi Arabia and Lebanon) have developed national guidelines that address this issue. In addition, some specific meetings were conducted by these countries on mitigation of the risk of a pandemic outbreak during mass gatherings, resulting in a set of recommendations. The national authority of the two countries, in coordination with the other stakeholders, have implemented the recommended preparedness and response measures before, during and after mass gatherings, which passed with no major outbreaks.

WHO did not recommend travel and movement restrictions but, advised ill persons to stay at home. All countries in the Region complied with the WHO recommendations by not restricting travel and movement. Some countries introduced measures, such as border control, entry screening, etc. in response to the pandemic. The impact of these measures on the transmission of the virus is not available due to the lack of data.

6. MAIN CHALLENGES

6.1 IHR 2005

- IHR national focal points worked effectively at the beginning of the pandemic. This became decreasingly unnecessary as the IHR did not require ongoing reporting of data. Therefore, countries stopped reporting after the escalation of the pandemic. This necessitates modification of the article related to reporting or the addition of a new article that obligates the continuous reporting of the required information about an event.
- Lack of resources hindered the ability to assess and build the core capacities of surveillance and response under the IHR 2005.
- There was insufficient and non-standardized implementation of surveillance at points of entry.

6.2 Preparedness

- There is great variation in terms of surveillance capacity among countries. Therefore, the ability of the public health systems for early detection, identification and reporting remains a challenge and the quality of the received data in terms of completeness, timeliness, reliability and comparability are questionable. Centralization and sustainability of the surveillance system needs special attention.
- Surveillance of influenza is not part of the routine system in most countries of the Region. Therefore, there was no baseline data for comparability and trend analyses.

- Different notification forms designed to fit the different stages of the pandemic created confusion at the country level. More orientation needs to be conducted for the countries to use the appropriate form at the appropriate phase of the pandemic.
- The private health sector is not part of surveillance. Data collected during the pandemic did not represent cases seeking health care in the private sector.
- Transparency in sharing information within countries and with WHO is a big challenge given the political and economic consequences that might follow.
- Not all countries have reliable laboratory diagnostic capacity.
- There is limited surge capacity in many NICs.
- There is limited laboratory surveillance capacity.
- There is a lack of standardized collection and shipments of specimens among countries.
- There has been shown to be adherence to guidelines and SOP for surveillance, clinical management of cases and laboratory diagnosis.
- There is insufficient availability of qualified and skilled human resources.

6.3 Response

Pharmaceutical interventions

- There is adherence to guidelines on antivirals.
- Delayed access to vaccines/quantity.
- Obstacles to complete the prerequisite steps before delivery of vaccines .
- Need to better understand and anticipate needs and the expectations of logistics.
- Communication and health education on vaccine.
 - Large quantities of unused vaccines.
 - Negative impact on routine EPI in some countries.

Non-pharmaceutical interventions

- Not all countries have developed communication strategies.
- Not all communication strategies comprehensively addressed all the aspects of communication.
- Need to be more proactive instead of being reactive.
- Need for continuous communications.
- Lack of communication “leaves the door open” to the conspiracy theorists.
- There is a need for a more unified communications structure across the Organization, or at least a means of creating and maintaining surge capacity.
- Mechanisms should be established to disseminate messages to different external audiences in a timely manner i.e. better use of web and social media.
- Need for better coordination with UN partners to avoid duplication of efforts.

7. CONCLUSIONS

Review of experiences to date with the pandemic influenza response enables countries of the Region to strengthen areas of weakness and build on current strengths. The International Health Regulations (2005) provide a powerful tool to engage decision-makers in strengthening capacities not only for this pandemic but also for other public health events. Under the IHR, countries have agreed to be transparent and to share information in a timely manner.

8. RECOMMENDATIONS

To Member States

Surveillance

1. Establish or strengthen existing, integrated surveillance systems.
2. Incorporate surveillance for seasonal influenza and other respiratory activities as part of routine surveillance, not only during pandemics.
3. Integrate the surveillance system within the health management information system in order to provide a coordinated and timely response to emerging and re-emerging diseases.
4. Share in a timely way information with WHO under the umbrella of the IHR. Data may be shared with WHO through different tools such as FluId, FluNet, etc.
5. Allocate an annual budget for strengthening and maintaining surveillance systems.

Laboratory

6. Ensure that laboratories support the surveillance of influenza activities and are prepared to identify unusual and non-typable strains of influenza using PCR or other available techniques.
7. Link laboratory-based surveillance to epidemiological surveillance.
8. Encourage laboratories to work towards becoming accredited as national influenza centres to enhance their access to resources and recognition for their work.
9. Allocate an annual budget for influenza laboratory-based surveillance, irrespective of the influenza pandemic.

10. Ensure that terms of reference for national influenza centres include the following:
11. Sharing their data internationally and reporting to the FluNet on a weekly basis.
12. Sharing isolates of seasonal influenza twice a year and non-typeable strains immediately and copying WHO.

National response coordination

13. Identify and actively involve different stakeholders in preparedness and response to any public health event that might be of international concern.
14. Advocate for reinforcement of the IHR (2005) requirements within countries.
15. Revise national preparedness and response plans and update them based on current experience and updated WHO guidelines on pandemic (H1N1) response.
16. Strengthen cross-border coordination and collaboration to respond properly to any public health event.

Non-pharmaceutical interventions

17. Involve communities, opinion leaders (such as religious leaders, celebrities, nongovernmental organizations, etc.) and social scientists in decisions taken related to non-pharmaceutical interventions in order to guarantee adherence to these interventions.
18. Enhance healthy behavioural practices (such as hand-washing, respiratory etiquette) in order to be the norm adopted as nonpharmaceutical interventions to respond to any event of a similar nature.
19. Implement control/mitigation measures based on scientific evidence and not on other interests.
20. Involve the media in the different phases of the event to prevent dissemination of incorrect messages to communities.

Health system response

21. Ensure the establishment of a health system country coordinating mechanism by involving different stakeholders.

22. Accomplish health system building blocks gaps assessment and priority-setting within national health plans to strengthen health systems.
23. Assess the situation of hospitals and intensive care units by listing their priority needs using WHO tools.
24. Document the impact of the pandemic on the health system and surge capacity.

Pandemic H1N1 vaccine

25. Revise vaccine deployment plans and modify them according to the current situation.
26. Assess the factors associated with the declination of the pandemic (H1N1) 2009 vaccine and raise public awareness about the importance of vaccination.
27. Revise communication strategies to address all constraints related to influenza vaccines in general and pandemic (H1N1) vaccine in particular.

To WHO

28. Share in a timely way, case definitions, guidance documents, guidelines and any other relevant information with Member States based on available knowledge as the pandemic evolves.
29. Support Member States to establish and maintain a strong surveillance system.
30. Provide continuous support to Member States to build their diagnostic capacities: human resources, technical and material assistance.
31. Provide Member States with software in order that they can computerize their laboratory inventories.
32. Assist Member States to collect and publish information on the early laboratory response to the pandemic.
33. Support Member States in transferring technology on virus isolation and strain selection needed for vaccine production.
34. Provide technical assistance to Member States to develop the preparedness and response strategies within the country in collaboration with neighbouring countries.

35. Support Member States to document their experience in the implementation of non-pharmaceutical interventions to mitigate the impact of the pandemic H1N1.
36. Provide technical support for health system strengthening upon request, through capacity-building courses and introduction of the Integrated Health Technology Package (IHTP).
37. Revise the regional strategy for vaccine deployment according to the current experience and share it with Member States.
38. Facilitate access to vaccines in the Region, especially for low-resource countries.

Annex 1**PROGRAMME****Tuesday, 27 April 2010**

08:30–9:00	Registration	
09:00–09:30	Opening Session: <ul style="list-style-type: none"> • Opening remarks • Objectives • Introduction of the participants • Adoption of the programme • Election of a Rapporteur 	<i>Dr J. Mahjour,</i> WHO/EMRO
09:30–09:50	Overview of global pandemic	<i>Dr V. Shinde, WHO/HQ</i>
09:50–10:10	Overview of regional pandemic	<i>Dr J. Jabbour,</i> WHO/EMRO
10:10–10:30	Overview on the pandemic review committee	<i>Dr M. Chu, WHO/EMRO</i>
10:30–11:00	Global surveillance approaches for pandemic H1N1: challenges and lessons learnt	<i>Dr V. Shinde, WHO/HQ</i>
11:15–11:30	Surveillance approaches for pandemic H1N1 in the Region: challenges and lessons learnt	<i>Ms D Samhoury,</i> WHO/EMRO
11:30–11:40	Surveillance of pandemic H1N1: Oman experience	
11:40–11:50	Surveillance of pandemic H1N1: Afghanistan experience	
11:50–12:05	H1N1 core capacity for surveillance, alert and response as per the requirements of IHR 2005	<i>Dr A. Merianos, WHO/HQ</i>
12:05–13:00	Plenary discussion: lessons learnt and way forward to support Member States to fulfil the core capacity for surveillance, alert and response of IHR 2005	
14:00–14:20	Upgrading of ILI surveillance: recommendations	<i>Dr M. Deming,</i> NAMRU-3
14:20–14:40	Global laboratory approach at the different phases of the pandemic H1N1	<i>Dr M. Chu, WHO/EMRO</i>
14:40–15:00	Laboratory services for pandemic H1N1 in the Region: challenges	<i>Dr G. Pimentel,</i> NAMRU-3

- 15:00–15:20 Laboratory response to the pandemic H1N1: Morocco
- 15:20–15:40 Laboratory response to the pandemic H1N1: Syrian Arab Republic
- 16:00–17:30 Working groups and presentations: lessons learnt and identification of strategies to strengthen laboratory services for pandemic H1N1 in the Region
- 17:30 Wrap up and break for the day

Wednesday, 28 April 2010

- 09:00–09:10 Recapitulation of previous day's proceedings
- 09:10–09:35 Global response to the pandemic *Dr A. Merianos, WHO/HQ*
- 09:35–10:00 UN system support to pandemic preparedness and response at country level/Egypt *Dr C. Wannous, UNSIC*
- 10:00–10:20 UN system support to the non-health pandemic preparedness and response at the regional level *Ms R. Zaqout, UN OCHA*
- 10:20–10:40 WHO support to national authorities to respond to pandemic H1N1: health cluster approach *Dr A. El Ganainy, WHO/EMRO*
- 10:40–10:50 National response to the pandemic: Egypt experience
- 10:50–11:00 National response to the pandemic: Tunisia experience
- 11:15–13:00 Working groups and presentations: gaps in responding to pandemic H1N1 in the Region and how to fill in the identified gaps
- 14:00–14:20 Regional outbreak alert and response network: an update *Dr L. Opoka, WHO/EMRO*
- 14:20–14:40 Role of non-pharmaceutical interventions in the response to pandemic H1N1 *Dr K. Coninx, WHO/HQ*
- 14:40–15:00 Regional communication strategy to respond to pandemic H1N1 in the Region *Mr O. Mohit, WHO/EMRO*
- 15:00–15:10 Restriction of mass gatherings to mitigate the impact of pandemic H1N1: Saudi Arabia experience
- 15:10–15:20 Restriction of mass gatherings to mitigate the impact of pandemic H1N1: Lebanon experience
- 15:35–17:00 Working groups and presentations: non-pharmaceutical interventions in responding to pandemic H1N1 in the

Region: challenges and way forward

17:00 Wrap up and break for the day

Thursday, 29 April 2010

09:00–09:10	Recapitulation of previous day's proceedings	
09:10–09:30	Health system response to the Pandemic H1N1: Challenges in the EMR	<i>Dr M. Farag,</i> WHO/ EMRO
09:30–09:50	Clinical management of Influenza cases during the pandemic	<i>Dr V. Shinde,</i> WHO/HQ
09:50–10:00	Health system response: Palestine experience	
10:00–10:10	Health system response: Pakistan experience	
10:10–11:00	Plenary discussion: health system response to the pandemic H1N1 in the Region: how to strengthen the gaps	
11:15–11:40	Global strategy for the use of pandemic H1N1 vaccine	<i>Dr K. Coninx,</i> WHO/HQ
11:40–12:20	Strategy for pandemic H1N1 vaccine deployment in the EMR	<i>Dr E. Mohsni,</i> WHO/EMRO
12:20–12:40	Survey on the pandemic and seasonal influenza vaccines coverage in the Region	<i>Ms D Samhour,</i> WHO/EMRO
12:40–12:50	Pandemic H1N1 vaccine campaign: Iran experience	
12:50–3:00	Pandemic H1N1 vaccine campaign: Jordan experience	
14:00–15:00	Working groups and presentations: factors associated with the low coverage of the pandemic H1N1 vaccine coverage in the Region: how to improve them	
15:00–5:15	Functioning of IHR during the pandemic H1N1 2009	
15:15–15:45	Conclusion and recommendations of the Meeting	
15:45–16:15	The way forward	
16:15	Closing Session	

Annex 2

LIST OF PARTICIPANTS

AFGHANISTAN

Dr Mohamed Nader Hasas
Director
Emergency Preparedness and Response
Ministry of Public Health
Kabul

Dr Navide Musarat
Surveillance Officer
Ministry of Public Health
Kabul

Dr Nakeebullah Ziar
Internal Coordinator
Surveillance Unit
Ministry of Public Health
Kabul

BAHRAIN

Dr Adel Salman Al Sayyad
Head of Communicable Disease Control Unit
Ministry of Health
Manama

Mrs Jameela Jafaar Ghazwan
Head, Medical Technologist
Public Health Laboratory
Ministry of Health
Manama

EGYPT

Dr Mohamed Abdel Hamed Genedy
Director General
Communicable Disease Department
Ministry of Health
Cairo

Dr Aly Abdel Satter Goma
Head of Virology Laboratory
Central Health Laboratories
Ministry of Health
Cairo

Dr Samir Abdel Aziz El Reffaez Abu-Zid
Director of Epidemiology Department
Preventive Sector
Ministry of Health
Cairo

Dr Ahmed Safwat Abdelghani
Head of Molecular Biology Laboratory
Central Public Health Laboratories
Ministry of Health
Cairo

Dr Mohamed Amin Hamed Farag
Medical Officer of Public Health
Ministry of Health
Cairo

JORDAN

Dr Aktham Hadadeen
Laboratory Director
Ministry of Health
Amman

LEBANON

Dr Nabil Salam
Head of Preventive Medicines Sub Directorate
Ministry of Public Health
Beirut

Ms Nadine Haddad
Epidemiologist
Epidemiological Surveillance Programme
Ministry of Public Health
Beirut

LIBYAN ARAB JAMAHIRIYA

Professor Abdulhafid Abudher
Director of National Center
Infectious Disease Control
General People's Committee for Health and Environment
Tripoli

Mr Ramadan Osman
Surveillance Officer
National Center Infectious Disease Control
Zliten Branch
Surveillance and Response Unit
General People's Committee for Health and Environment
Tripoli

MOROCCO

Dr Abderrahman Benmamoun
Head of Communicable Diseases Division
Directorate of Epidemiology and Diseases Control
Ministry of Health
Rabat

Dr Amal Barakat
Officer at the Immunology/Virology Department
National Institute of Hygiene
Ministry of Health
Rabat

Dr Fouad Jettou
General Director
Communicable Disease Center
Casablanca

OMAN

Dr Salah Al Awaidy
Director
Communicable Diseases Surveillance and
Control
Ministry of Health
Muscat

Dr Sulaiman Mohd Al Busaidi
Director
National Influenza Control Programme
Ministry of Health
Muscat

Dr Faryal Ali Khamis
Senior Consultant
Infectious Diseases
Royal Hospital
Muscat

PAKISTAN

Dr Samra Mazhar
Assistant Director General
Federal Ministry of Health
Islamabad

Dr Arif Zaka
National Program Manager
National Influenza Control Programme
Federal Ministry of Health
Islamabad

Dr Jaleel Kamran
Head of Epidemic Investigation Cell
Public Health laboratory Division
Federal Ministry of Health
Islamabad

PALESTINE

Dr Iyad Arafah
Director
Communicable Diseases Control Department
West Bank

QATAR

Dr Mohd Mohd Al Hajri
Acting Manager
Health Protection and CDC
Public Health Department
Supreme Council of Health
Doha

Dr Hamad Eid Al-Romaihi
Specialist Community Medicine
Public Health Department
Supreme Council of Health
Doha

SAUDI ARABIA

Dr Raafat Faisal Al Hakeem
Director General Infectious and Parasitic Disease
Ministry of Health
Riyadh

Dr Musallam Abohassan
Director Infectious Disease Unit
Ministry of Health
Riyadh

SYRIAN ARAB REPUBLIC

Dr Shibl Afif Al Khoury
Director Public Health Laboratories
Ministry of Health
Damascus

Dr Hani Laham
Deputy Director
Communicable Diseases
Ministry of Health
Damascus

Dr Khaled Baradie
Deputy Director Health Care
Ministry of Health
Damascus

TUNISIA

Dr Noureddine Ben Jemaa
Vice Director
National Observatory New and Emerging Diseases
Ministry of Public Health
Tunis

Dr Mondher Bejaoui
Vice Director
Primary Health Care Directorate
Ministry of Public Health
Tunis

Professor Amine Faouzi Slim
Director
National Influenza Laboratory
Hospital Charles Nicolle
Ministry of Public Health
Tunis

UNITED ARAB EMIRATES

Dr Mahmoud Fikri
Executive Director
Health Policy Practices
Ministry of Health
Abu Dhabi

Dr Najat Rashid
Executive Director
Health Policy Practices
Ministry of Health
Abu Dhabi

YEMEN

Dr Magid Yahia Al Gunaid
Deputy Minister for Primary Health Care
Ministry of Public Health and Population
Sana'a

Dr Saeed Al Shaibani
General Director
Central Laboratory
Ministry of Public Health and Population
Sana'a

Dr Mohammed Ibrahim Jahaf
Coordinator of Laboratory Based Surveillance
Ministry of Public Health and Population
Sana'a

OTHER ORGANIZATIONS

US Naval Research Unit No. 3 (NAMRU-3)

Dr Michael Deming
CDC FLU
NAMRU-3
Cairo

Dr Guillermo Pimentel
Deputy Head
Virology Programme
NAMRU-3
Cairo

Dr Hala Essmat
NAMRU-3
Cairo

Dr Atef Soliman
Senior Scientist
NAMRU-3
Cairo

Dr Salma Afifi
Medical Epidemiologist
NAMRU-3
Cairo

Dr Serge Manoncourt
Medical Epidemiologist
NAMRU-3
Cairo

UN Office for the Middle East North Africa and Central Asia (UN OCHA)

Dr Rana Zaqout
Regional Planning Officer
Pandemic Influenza Contingency
Regional Office for the Middle East
North Africa, and Central Asia (ROMENACA)
Cairo

Dr Wael Kamel
National Planning Officer
Pandemic Influenza Contingency
Regional Office for the Middle East
North Africa, and Central Asia (ROMENACA)
Cairo

United Nations Resident Coordinator (UNRC)

Dr Chadia Wannous

Senior Adviser

Avian and Human Influenza

Cairo

World Food Programme (WFP)*

United Nations International Children's Fund (UNICEF)*

* Apologized

WHO SECRETARIAT

Dr Jaouad Mahjour, Director, Communicable Diseases Control, WHO/EMRO

Dr Zuhair Hallaj, WHO Temporary Adviser, Cairo

Dr Ezzeddine Mohsni, Coordinator, Communicable Diseases Control, WHO/EMRO

Dr John Jabbour, Acting Regional Adviser, (Epidemiologist) International Health Regulations, Communicable Disease Surveillance, Forecasting and Response, WHO/EMRO

Dr Langoya Opoka, Epidemiologist, Communicable Disease Surveillance, Forecasting and Response, WHO/EMRO

Dr Ali Mafi, Technical Officer, Communicable Disease Surveillance, Forecasting and Response, WHO/EMRO

Ms Dalia Samhouri, Technical Officer, Communicable Disease Surveillance, Forecasting and Response, WHO/EMRO

Dr Mounir Farag, Acting Regional Adviser, Health System Strengthening, WHO/EMRO

Dr May Chu, Medical Officer, Laboratory Alliances and Biosafety, WHO/HQ

Dr Angela Merianos, Medical Officer, Alert and Response Operations, WHO/HQ, Dr Kanokporn (Jum) Coninx, Technical Officer, H1N1 Coordination and Response, WHO/HQ

Dr Vivek Shinde, Medical Officer, H1N1 Coordination and Response, WHO/HQ

Dr Ahmed Al Ganainy, Operations Support Manager, Emergency and Humanitarian Actions, WHO/EMRO

Mr Omid Mohit, Technical Manager, Media and Communication, WHO/EMRO

Dr Ahmed ElSedaway, SHOC Consultant, WHO/EMRO

Dr Pierre Abi Hanna, Infectious Disease Consultant, WHO Temporary Adviser

Mr Hossam Younis, Service Desk Administrator, WHO/EMRO

Mrs Azza Tag el Din, Secretary, Division of Communicable Disease Control, WHO/EMRO

Ms Asma Gazzaz, Secretary, Division of Communicable Disease Control, WHO/EMRO

Ms Mirna Mikhael, Secretary, Division of Communicable Disease Control, WHO/EMRO