



-

National Epidemic and Pandemic Preparedness Plan, Pakistan

Submitted to

**World Health Organization
Islamabad**

December, 2014

Dr Ejaz Ahmad Khan
Consultant

TABLE OF CONTENTS

I. ACRONYMS	5
II. EXECUTIVE SUMMARY	6
III. INTRODUCTION AND BACKGROUND	9
IV. Objectives	10
V. Methodology.....	10
A. Document review	10
B. In-depth interviews (IDI) and consultation with the stakeholders (national and provincial authorities)	10
C. Analysis of data available with the NIH’s EIC	11
D. Field Plan.....	11
E. Variables of Interest for Data Collection	11
F. Data Analysis and Report Writing.....	11
G. Dissemination of Findings, and incorporating feedback from stakeholders.....	12
VI. REVIEW OF THE EXISTING PANDEMIC INFLUENZA PREPAREDNESS PLAN of the country	13
H. Indicators for planning and coordination.....	13
I. Indicators for Situation Monitoring and Assessment	14
J. Indicators for Prevention and Containment	15
K. Indicators for communication	17
VII. In-depth interviews (IDI) and consultation with the stakeholders (national and provincial authorities)	17
VIII. Analysis of the Seasonal Awareness and Alert Letter (SAAL) data with the Federal Epidemiology and Disease Surveillance Division (FE&DSD)	19
L. Crimean Congo Haemorrhagic Fever (CCHF):.....	20
M. Dengue:	20
N. Diphtheria	20
O. Acute Gastroenteritis.....	20
P. Acute Viral Hepatitis:.....	21
Q. Influenza H5N1/H1N1:	21
R. Leishmania:	21
S. Malaria:	21
T. Measles:	21
U. Meningitis:	21
V. Pertussis:	22
W. Polio:	22
X. Typhoid Fever:.....	22
Y. The demographic and health profile of Pakistan	22
Z. Figure 1. Pakistan’s district level administrative boundaries.....	23
AA. The human and animal healthcare system in Pakistan.	23
BB. Animal Health Care System, Disease Surveillance and Response System	24
CC. Animal Disease Surveillance and Response by MINFAL	25
DD. 2.1. Institutional Arrangements.....	26
IX. Frequency of meetings and quorum.....	29
2.1.3. Coordinated Incident Command Structures	29
Figure 2. Emergency Coordination and Management Structure for Pandemic Preparedness and Response.	30
2.2. Intersectoral Response.....	30

EE.	Preventing disease spread to humans.....	32
FF.	Central Government agencies: Ministry of National Health Services, Regulation and Coordination (lead)	32
GG.	Ministry of NHR&C and Provincial Ministries of Health.....	32
X.	City Corporations, Municipalities and DISTRICT Administration	33
HH.	Ministry of Economic Affairs Division.....	33
II.	Central Government agencies: Ministry of Finance (lead)	33
JJ.	Ministry of Finance and Baitul Maal.....	34
KK.	Banks.....	34
LL.	PTA.....	35
MM.	Media	35
NN.	Ministry of Education.....	35
OO.	Chamber of Commerce and Industry	36
PP.	Private Companies.....	36
XI.	WHO Health Organization (WHO)	37
XII.	Food and Agricultural Organization (FAO).....	37
XIII.	UN Children’s Fund (UNICEF)	37
3.1.	Objective	38
3.2.	Pandemic Preparedness Strategies – Preparedness Phase	39
3.2.2.3.	Community preparedness	46
QQ.	Stockpile of Antiviral drugs and Personal Protective Equipment.....	46
RR.	Chemoprophylaxis: Post exposure therapy of the selected high-risk groups (greens: fear of becoming yellow of red)	47
SS.	Table 3: Scenario 1, low transmissibility of infection.....	51
TT.	Members of the Incident Operation Centre	54
UU.	The Containment procedures	58
XIV.	REFERENCES.....	66

I. ACRONYMS

CCHF	Crimean Congo Haemorrhagic Fever
CFR	Case Fatality Rate
DEWS	Disease Early Warning System
DF	Dengue Fever
DHIS	District Health Information System
EMRO	Eastern Mediterranean Region Office
FE&DSD	Field Epidemiology & Disease Surveillance Division
H1N1	Swin Flue (Influenza A H1N1)
H5N1	Avian Influenza
IDI	In-depth Interviews
IDSR	Infectious Disease Surveillance and Response
IHR	International Health Regulations
ILI	Influenza-Like Illness
LMIC	Low and Middle Income Countries
M/o NHR&C	Ministry of National Health Services, Regulation and Coordination
MINFAL	Ministry of Food, Agriculture and Livestock
NDMA	National Disaster Management Authority
NDRF	National Disaster Risk Reduction Framework
NEPP	National Epidemic and Pandemic Preparedness Plan
NIH	National Institute of Health
PPP	Public Private Partnership
SARI	Severe Acute Respiratory Infections
SARS	Severe Acute Respiratory Syndrome
WHO	World Health Organization

II. EXECUTIVE SUMMARY

WHO's Twelfth General Programme of Work declares reduction of "mortality, morbidity and societal disruption resulting from epidemics through prevention, preparedness, response and recovery activities" as one of its five strategic requirements. A pandemic preparedness plan should ideally have a few components as its essential parts to make it action-oriented plan. These areas should be and not limited to: (1) improving the current disease surveillance systems (2) vaccinating high-priority risk groups of the population (3) an on-going research to create evidence to facilitate new technologies and interventions according to communicable disease pattern with in the country (4) integrated and robust communication systems for rapid information communication and response mechanisms, (5) facility-based emergency preparedness to deal with any untoward public health emerging situation, and (6) stock piling enough vaccines required to tackle epidemics or pandemics. These facts are well-recognized phenomenon by the international community and UN agencies.

One of the major emerging pandemic threat is the highly pathogenic avian influenza caused by influenza A subtype H5N1, plus other strains such as H7N9. The virus has affected poultry and wild and migratory birds in 61 countries since 2003 and as of September 2009 has been detected and reported in Pakistan as well as neighboring and regional countries of India, China, Bangladesh, and Nepal. The virus has affected multiple countries in Europe, the Near East, Africa and Asia.

Pakistan developed the National Influenza Pandemic Preparedness Plan in 2005. Later on, with an objective to strengthen the processes, two separate National Avian and Pandemic Preparedness Programmes in human and in animals were concurrently started in 2007 by the defunct Ministry of Health at the NIH, and Pakistan Agricultural Research Council at the NARC. These plans had a joint national steering committee notified at national level under the Chairman and Co-chairmanship of Federal Health and Livestock Ministers, respectively. However, since the devolution in 2011, this structure is virtually non-existent currently, and there is no dedicated programme for the prevention and control of Avian and Pandemic Influenza is in place at the federal level. Nonetheless, the laboratory based sentinel surveillance to monitor the circulating strains of Influenza viruses is being conducted in human and poultry health sectors by the NIH and NARC, both, respectively. In animal health sector a PARC-funded national program is assisting eight provincial institutions for undertaking surveillance and diagnostics for major avian diseases including Avian Influenza.

Health Information System in Pakistan is not well-organized. There are more than one systems which work in parallel for information transmission from the district level to the provincial and to the federal level. Once efficiently working Disease Early Warning System (DEWS) is waning away and is notifying with limited access in a few areas. Disease notification and response has obvious delays in their processes perhaps enough to let any epidemic or pandemic strike in surprise. Health care facilities at district and national levels also lack infection control capacities to isolate and treat human cases of avian influenza. Seasonal influenza vaccination is not practiced in Pakistan.

It is the high time that Pakistan develops its pandemic preparedness plan in the context of the devolution. The plan needs to cater the devolved responsibilities of the provinces

under the auspicious umbrella of the constitution. It should carry forward the lessons learnt and devise practical solutions of bottlenecks of the system. The already developed plan of 2007 may form the base and a reference to this work. This proposal thus encompasses these aspects of a robust pandemic preparedness plan for the country

The general objectives of the National Epidemic and Pandemic Preparedness Plan (NEPPP) are:

- (i) to minimize the opportunities for human infection,
- (ii) to strengthen epidemic surveillance and early warning system and response,
- (iii) to contain spread of virus at the source and reduce social disruption,
- (iv) to minimize associated morbidity, mortality, and
- (v) to monitor and evaluate the response capacity, and coordination mechanisms.

To achieve the above-mentioned objectives, the NEPPP envisages the following specific objectives, which will be translated into strategic actions under this plan:

- To establish National Steering Committee, Executive Committee and their counterparts in the provinces to develop policies, undertake political decisions for implementation of the plan and ensure collaboration and coordination amongst relevant sectors;
- To establish robust pandemic preparedness and response mechanisms working through incident command systems to respond effectively and efficiently to influenza outbreaks in animals and humans;
- To outline sectoral and inter-sectoral roles, responsibilities and functions of human and animal health, and other sectors directly or indirectly involved in emergency management.
- To develop capacities of the provincial and regional laboratories in both the human and animal health in diagnosing influenza and emerging similar viruses, and establish their close coordination and collaboration with the national and global laboratory system;
- To Institute lab-bases surveillance system with weekly analysis of data at district, provincial and national levels;
- To identify and train Rapid Response Teams (RRT) at district, provincial and national levels for conducting epidemiologic investigations and rapid responses to outbreaks in both the animal and human health sectors;
- To strengthen border controls and surveillance at the administrative levels ;

- To provide adequate Personnel Protective Equipment (PPE) and training on use of PPE for persons working in laboratories, health care facilities and farms and also for cullers and any other workers at risk;
- To stockpile antiviral drug and develop a clear-cut policy for strategic use of the antiviral drugs;
- To develop and implement a risk communication strategy for high risk occupational groups, media and general community, and do measures to aware the infection control measures at the household level and at community level;
- To develop health and essential services contingency plan for implementation during outbreaks in poultry or in the phase of pandemic;
- To, explore ways to have access to appropriate vaccines if and when they are required.

Pakistan's National Influenza Pandemic Preparedness and Response mechanism is based on the WHO phases. Detailed description of the WHO pandemic Phases is placed on Appendix II-.

III. INTRODUCTION AND BACKGROUND

A pandemic preparedness plan should ideally have a few components as its essential parts to make it action-oriented plan. These areas should be and not limited to: (1) improving the current disease surveillance systems (2) vaccinating high-priority risk groups of the population (3) an on-going research to create evidence to facilitate new technologies and interventions according to communicable disease pattern with in the country (4) integrated and robust communication systems for rapid information communication and response mechanisms, (5) facility-based emergency preparedness to deal with any untoward public health emerging situation, and (6) stock piling enough vaccines required to tackle epidemics or pandemics. These facts are well-recognized phenomenon by the international community and UN agencies. In this context, the WHO's Twelfth General Programme of Work declares reduction of "mortality, morbidity and societal disruption resulting from epidemics through prevention, preparedness, response and recovery activities" as one of its five strategic requirements[1-5].

The recent years have seen emergence of epidemics and pandemics, and even reemergence of virus strains. Starting from the famous SARS pandemic to HINI,H2N2 and H9N2, a number of pandemics and epidemics have threatened the world, the Middle East Respiratory Syndrome Coronavirus (MERS-CoV) and the latest being Ebola outbreak converting into an epidemic and likely to expand as a pandemic if nothing concrete public health intervention are done on time. These diseases carry a surprise factor when they attack and inflict high morbidity and mortality for human populations. Different models and scenarios of Influenza Pandemic from early twentieth century depict that any similar incidence might lead to high mortality, more than 50 million people per year, in resource constraint countries[6-10]. Sadly, most of the Asian countries lack close coordination on genetic sequencing with other countries around the globe, which may lead to poor performance when it comes to preparedness for any pandemic response[11].

Pakistan, being an LMIC, is no exception being vulnerable to such pandemics. It will more prudent to state that the frequent exposure of the country to both the natural and man-made disasters have tested the public health emergency and response system of the country, which is unfortunately not been able to meet the international standards. Most of the responses were made without reflecting to the lessons learnt. No practical measures, except building capacity, which also has not been able to prove its effectiveness, have been successfully implemented. There is an absolute lack of proper planning in terms of preparedness, increasing community resilience and building mechanisms to respond within "the golden hour" of any public health emergency[12-18].

It is the high time that Pakistan develops its pandemic preparedness plan in the context of the devolution[19]. The plan needs to cater the devolved responsibilities of the provinces under the auspicious umbrella of the constitution. It should carry forward the lessons learnt and devise practical solutions of bottlenecks of the system. The already developed plan of 2007 may form the

base and a reference to this work. This proposal thus encompasses these aspects of a robust pandemic preparedness plan for the country.

IV. OBJECTIVES

The aim of this assignment is to prepare country's comprehensive epidemic and pandemic preparedness plan.

The specific objectives of the consultancy are:

1. To conduct Epidemic and Pandemic Situation analysis of Pakistan
2. To review the Pakistan Pandemic Preparedness plan 2007 and update with the consultation of national and provincial health authorities
3. Update / develop the National Plan in the current scenario of Devolution and in the lines of WHO Pandemic management guidelines 2013
4. Present the draft plan for consensus building and adaptation by the provinces

V. METHODOLOGY

Methodology for the reviewing and updating the National Epidemic and Pandemic Preparedness Plan (NEPPP) will be based on literature and document review, In-depth interviews and consultation with the national and provincial authorities, and an analysis of available data on epidemics with the NIH's Field Epidemiology & Disease Surveillance Division (FE&DSD).

A. Document review

There has been some good efforts in the past on preparing a comprehensive plan. The Pandemic Preparedness Plan of 2005-7 will be critically reviewed in the context of its reflecting to the established guidelines, updating to post devolution scenario, and lessons learnt through the past experiences. In addition to this, any pertinent provincial available documented will also be consulted.

B. In-depth interviews (IDI) and consultation with the stakeholders (national and provincial authorities)

There will be 10 IDIs will be conducted with the national and provincial authorities of planning and health departments (two in each province). Face to face consultation with the disaster management authority and independent public health expert will also be conducted for triangulation of the themes.

The choice for the quasi-experimental design is motivated by due consideration to the complexities involved in such public health programmatic evaluations. The comparison of designs used in public health studies, especially evaluations is below.

C. Analysis of data available with the NIH's EIC.

The Epidemic Investigation Cell of the NIH is the one which collects DEWS data on infectious disease and communicable disease outbreak, and publishes them. The data and reports of the Cell will be analysed to understand the seasonal trends of the notifiable diseases, and using the information for tailoring the plan on available local evidence in addition to global modelling of pandemics and epidemics.

D. Field Plan

1. Field data collection

There will be a Field Coordinator that will visit the province, meet the provincial staff, and map the key persons to be interviewed. The Principal Investigator or his nominee will conduct the interviews. These interviews will be recorded, translated and transcribed. A total of 6 days will be used for this field data collection.

E. Variables of Interest for Data Collection

The data against following variables of interest will be collected for updating and development of the plan:

Variables
Recognition of Pandemic Preparedness Plan
Commitment for resource allocation for preparedness plan
Organization/Focal person responsible for the implementation of Plan
Realistic time line for completion of various components of the Plan
Stakeholders involvement, commitment and focal persons identified for implementation of a preparedness plan
Existence of roles and responsibilities on pandemic preparedness plan
Target audience identifies and approached
Command and control system
Risk assessment
Communication
Legal and ethical issues
Response plan by pandemic phase
Surveillance for pandemic phase
Case investigation
Case management
Preventing measures in place to address spread of disease in the community
Maintaining essential services
Research and evaluation

F. Data Analysis and Report Writing

Data will be programmed, analysed, and reported by the consultant. This will include both quantitative and qualitative aspects. For quantitative data trend analysis of the reportable disease will be produced. Quantitative comparisons will also be statistically examined for significance of the findings

Qualitative themes appearing from the in-depth interviews will be deliberated upon. Recommendations will be made from the results of the both the sources of methodologies, and will depict both best practices, and lessons learnt in areas where trainings have been successful, and on the weaker areas that need improvement. This will be incorporated in the Plan along with the evidence from literature.

G. Dissemination of Findings, and incorporating feedback from stakeholders

One consultative meeting with all the stakeholders will take place to share the draft plan for their feedback and concurrence, and ownership.

VI. REVIEW OF THE EXISTING PANDEMIC INFLUENZA PREPAREDNESS PLAN OF THE COUNTRY

An extensive review of literature set the scene to review and analyse the Pakistan's National Pandemic Preparedness Plan (2005). A PC-1 was prepared then to translate the concept into implementation by then Ministry of Health. Since 2011, after the 18th Constitutional Amendment, Health has become sole responsibility of the provinces. Yet, the federation is expected to keep playing its role of steering the processes, and coordinating with the international agencies and partners.

The lessons learnt from the last-declared pandemic of Influenza in 2009, necessitated existing of robust preparedness plans in all regions of the World[20]. During 2011, the World Health Organization conducted a "Comparative Analysis of National Pandemic Influenza Preparedness Plans" by using good methods to assess completeness values of those plans. The analysis considered plans from all the WHO regions, including the Eastern Mediterranean Region Office (EMRO), which unfortunately could not include Pakistan as the required data were not available from the country[21].

The plan was reviewed in isolation followed by an In-depth Interview (IDI) with the Field Epidemiology & Disease Surveillance Division (FE&DSD) (former EIC of the NIH)'s lead person and the author of the plan. Both the techniques used the same and above-mentioned report's checklist. The plan was assessed (a) indicators for planning and coordination, bot at the national and sub-national levels, (b) indicators of situation monitoring and assessment, (c) indicators for prevention and containment, (d) indicators for health system response, and (e) indicators for communication on a scale of 0-3, where 0 is "not-mentioned OR No" , 1 is "mentioned OR yes", 2 is "mentioned in brief", and 3 is "mentioned in detail". Below is the narration of the analysis based on scoring of the individual items/indicators (Annex-1):

H. Indicators for planning and coordination

2. National level

The plan was prepared back in 2005 when guidelines on H5N1 were present but most of the latest and post-H1N1 pandemic guidelines were not available. The plan do not have any legal framework to support its mandatory implementation. The plan did not include provisions to make it a part of the national disaster preparedness plan or National Disaster Risk Framework (NDRF) of the National Disaster Management Authority (NDMA). The plan also did not mention constitution of a National Pandemic Planning Committee (NPPC) or a Task Force. The highest possible level of commitment and responsibility at the national is therefore missing in the document. Similarly, the plan also does not talk about a Command and Control Structure, which is an essential system to be in place to deal with national and international level emergencies.

Regarding coordination and communication with other agencies and international cooperation, the plan does mention international cooperation for pandemic preparedness and response. However, only one local agency is included in local cooperation (Ministry of Food, Agriculture and Livestock, MINFAL). But lacks a robust structure for communication and coordination with agencies.

There are no timelines for completion of each phase of the plan. The plan does not take maintenance of essential services during the pandemics into an account. This makes the plan extremely unlikely to be successful in pandemics, posing harm rather than good, and difficult to be monitored and evaluated for further improvements. There are no monitoring and evaluation strategies, and responsible agencies whatsoever, spelled in the document. Further, the plan does not cater for impact assessments of pandemics in terms of morbidity, mortality, and overall impact on health or risk assessment of pandemic. There are no mention of mock exercises to be better prepared for pandemic, and to test and improve the plan, in the document. No timelines are mentioned for reviewing the plan. There are also no documentation of country level triggers to change the level of response to pandemic. The pandemic planning and response measures are not organized by the World Health Organization's (WHO) pandemic phases, apparently because they were not in place when the plan was being prepared during 2005-2007.

The plan has a well-detailed financial provision for the activities outlined in the document.

3. Sub-national level

There are some sub-national pandemic preparedness plans, and are discussed in the respective section of the document.

I. Indicators for Situation Monitoring and Assessment

Generally, the plan details the communication mechanisms with both the national and international agencies and partners. But lacks processes and guidelines to make the communication rapid and on-time. In addition to this, the plan is also devoid of any information on implementation of the International Health Regulations (IHR) for pandemic response. This was due to the fact that the IHR was not part of the then government agency responsible for drafting the plan, and it could not make any commitment for its inclusion in the plan.

Influenza is neither a part of the national Infectious Disease Surveillance and Response (IDSR) system, nor is mentioned within the plan. The WHO's surveillance activities in phased or period manner are also not addressed as they were not implemented by that time (2005-2007).

4. Inter-pandemic surveillance

The country does have the influenza surveillance system in place with the NIH labs within ILI and SARI, both. Sentinel sites are available in the provinces and areas for surveillance. This arrangement can work for inter-pandemic surveillance.

The plan does not mention participation in Global Influenza Surveillance Network. It does not specifically outline any early warning system for influenza, which could make it robust and capable of highlighting early treatment.

5. Enhanced surveillance and pandemic surveillance

The plan does not give guidance on how to do effective surveillance in cases where there are new strains of the influenza virus. It also does not specify concomitant surveillance of other potential influenza-like viruses, and how the existing surveillance system could be scaled-up in a pandemic situation.

6. Animal surveillance

Under the umbrella of the MINFAL, the plan describes influenza surveillance in susceptible animals. It also describes communication strategy, through an identified communication group at the federal level, to connect information sharing between animal and human surveillance for influenza. Currently, this is being regularly pursued at a limited scale, which seems to be insufficient to deal with any influenza pandemic scenario.

J. Indicators for Prevention and Containment

7. Individual/household and community infection control measures

The plan has explained both the individual/household and community level infection control measures. These measures are both generic and specific for influenza control measures. Nevertheless, since 2005-2007 a substantial development in infectious disease prevention, especially lessons learned from the 2009's influenza pandemic, has taken place; updating this information is required to make the plan coherent with the latest evidence in public health practice.

8. Social distancing

The plan does not have coordination and partnership of some of the key stakeholders such as educational institutions, disaster management organizations and district governments. This has led to an absence of strategies pertaining to school closures, mass gathering and measures to mitigate, respond and contain further spread of infection during influenza pandemics.

9. Travel and trade

The plan clearly lacks this important information. There are no clear advisories and restrictions on travel to and from the affected areas. Similarly, the plan also does not refer to the WHO's checklist for trade restrictions and advisories to and from the affected areas. These are usually mandatory in a national level plan in containing any pandemic.

10. Isolation and quarantine

There is brief information on isolation or confinement of the cases. The SOPs regarding contacts and others have also been described in brief.

11. Antiviral drugs

The plan has good description on the use of antiviral drugs during influenza pandemic for treatment. The details for using antivirals for treatment are also explained. However, the plan fails to explain on priority groups for antiviral prophylaxis in case of expected pandemic.

There is a mention of procurement modalities for antiviral drugs with estimated amount. This does not elaborate on details of sources of antivirals, their stockpiling, further calculations based on the suspected population groups, and triggers for supply chain operations in case of pandemic. There are no details on monitoring of the use, efficacy, drug resistance and adverse events following immunization of the antiviral drugs.

12. Vaccines

The plan mentions use of vaccination in population groups giving a policy outline but does not elaborate on mass vaccination protocols and procedures. It does not mention sources of vaccine procurement, their storage and supply chain management.

13. Other pharmaceuticals and supplies

Although the country has working laboratory network for routine influenza testing and those data are regularly being shared with national and international agencies, including WHO, yet the plan does not speak about or give guidelines for standard laboratory procedures, human specimen collection, handling, transport and disposal.

The plan is devoid of instructions on procurement of other medications such as antibiotics and antipyretics, and a mention of medical supplies procurement/logistics for infection prevention and control.

Monitoring strategy, as for antivirals and vaccines, is also absent for drug resistance.

14. Epidemiological investigation and contact management

The plan lacks flexibility and scalability according to changing patterns of the pandemic with emergence of new and resistant strains of the virus. There is no information on epidemiological investigation of confirmed cases of influenza caused by new strains.

There are however, descriptions of mechanisms for rapid and timely (usually on daily basis) exchange of outcomes of epidemiological investigations with the national and international agencies (WHO).

This information exchange remains partially effective as there is no information on assessing, investigating and reporting new strains of the virus, which may alter the disease pattern and may increase the severity of the disease despite of having good information exchange.

15. Case management and treatment and infection control in health care setting

The plan specifies training needs for health workers and details on their capacity building in surveillance, laboratory, infection control, case management, antivirals, vaccine management etc. The plan also gives details of health facilities' priorities such as triage, case referrals, service prioritization etc. during pandemics. Nonetheless, these measures remain primitive and need robust emergency/disaster management's scientific information and SOPs incorporated in the plan.

There is a good information on infection prevention and control at all level of health care facilities. This also needs to be updated in light of the recent advances since 2009.

Pakistan does have established guidelines for diagnosis, admission, treatment and discharge for the management of pandemic influenza. The plan, however, does not identify health facilities where suspected cases of influenza should be managed. In cases where the hospital bed surge

capacity of the specified hospitals may be overrun by the number of cases, there should be a mention of alternative sites for the medical care, which is also not highlighted in the plan.

16. Surge for health personnel and handling mortality

As the plan is not developed on basic principles of disaster medicine, it lacks guidelines for recruiting and securing health care workers from other cadres and using the pool of volunteers. In case of excess mortality, the plan is quiet on safe handling of the dead bodies in line with both the scientific evidence and the cultural/religious norms.

K. Indicators for communication

The plan mentions and describes composition of the communication team at the federal level. It has the plan for communicating to both the health and non-health authorities. It has pandemic communication committee and spokesperson with the roles identified. However, the plan for communicating to the non-health authorities is not well-described as there are gaps in identifying the non-health authorities as stakeholders in executing the plan. Nevertheless, the plan specifies the roles of civil society and other community organizations in public education and communication.

There is a good description on communicating to the international agencies such as WHO and FAO. However, the plan lacks information of communicating to the policy makers and governmental partners required for coordination in health emergencies. There is communication plan and strategy for the public and risk groups.

As the plan does not have triggers for phases identified, the plan remains deficient in terms of identification of public communication messages for each phase of the pandemic, and any communication channels for this.

The plan has no strategy to reach hard to reach community, internally displaced persons, refugees, migrants, ethnic minorities, people living in difficult circumstances, immunocompromised, and urban poor and marginalized.

There is also no plan to improving and updating communication messages on new knowledge and new evidence. There is no strategy whatsoever to monitor and evaluate communication messages to ascertain if they were doing more good than harm or otherwise.

VII. IN-DEPTH INTERVIEWS (IDI) AND CONSULTATION WITH THE STAKEHOLDERS (NATIONAL AND PROVINCIAL AUTHORITIES)

The consultation was carried out through key health officials at the provincial levels. All the provinces and areas were contacted and a brief triangulation of the results is described below;

The Khyber Pakhtunkhwa has a plan which does not cater for the close coordination with the global surveillance system, work with international agencies, and with educational system of the country. The plan also does not have any risk communication system addressed, and through any mention of its relevant committee.

The AJ&K's plan has numerous gaps. There is no IHR compliance, and coordination with the WHO and/or other international agencies for pandemic preparedness and response. There is also no

mention of infection control measures at the household or community level. There is also no information regarding social distancing, travel advisory, and trade related concerns in case of a pandemic or epidemic. There are no priority groups mentioned for antiviral prophylaxis. There is also absolutely no mention of vaccine/antivirals storage distribution and monitoring. In addition to this, there is also lack of mention of pandemic vaccine supply guidelines, strategy, and source of funding, storage facilities and monitoring of the process. Standard lab procedures, sharing of clinical materials and monitoring of antiviral resistance is also lacking. The plan does not cater for epidemiological investigation of the cases of influenza and consequently has no mechanism of timely and rapid exchange of outcome of investigations with the national and international agencies. For response, there is no mention of health facilities and alternate health facilities, and for essential strategies within those facilities such as triage of the patients etc. There is also no information regarding infection prevention and control in the healthcare facilities, and to provide these facilities with the extra human resource in case of any epidemic or pandemic. There is absolutely no communication system, including communication team and mechanism, which is taken care off.

The Punjab has also developed its plan at sun-national level. This plan does not have a subnational pandemic preparedness task force or committee. Their plan also does not mention influenza as part of the IDSR. The plan does not specify surveillance systems that detect unusual occurrence of influenza or unusual/unexplained event of respiratory illness that require appropriate investigation. The plan also does not include influenza surveillance in susceptible animals (poultry, wild birds, pigs), and also does not specify communication strategy (sharing surveillance information, meeting etc.) between human and animal surveillance. There are no community infection control measures to limit animal-human transmission mentioned in the Punjab's plan. There are no protocols and implementation plan for closure of educational institutions or day care facilities, other social distancing measures such as prohibition of mass gatherings etc., travel related information (restrictions, advisory) to and from affected areas, trade related information (such as restrictions) to and from affected areas, and information regarding quarantine of contacts or others. The plan also does not specify vaccination use/policy for pandemic influenza, mass vaccination for pandemic influenza, strategies for pandemic vaccine supply/procurement (such as estimated amount, % of population, contract/ arrangement with manufacturers etc.), the sources of pandemic vaccine, monitoring strategy for pandemic vaccine (such as monitoring coverage, efficacy, or adverse events), and the monitoring strategy for antiviral drug resistance. Given the fact that the province has the largest proportion of population, over all, the plan has gross deficiencies which need to be addressed so that the province is in better position to tackle any pandemic situation.

The Gilgit Baltistan does not have a pandemic preparedness plan. Three IDIs with PPM EPI, Executive DHO, and Deputy Director Health Services revealed that there is a broad consensus on having sentinel sites for reporting, followed by case investigation, reporting and health education, along with close coordination with the MINFAL and veterinary departments. Need of the Rapid Response Teams was also mentioned. The IDIs also mentioned necessity of having good lab component with good laboratory based surveillance, and availability of vaccines and medicines for influenza pandemic. Issues of human resource availability and security should also be addressed. Involvement of hospitals, their preparedness levels and availability of trained human resource for influenza pandemic/other pandemics should be ensured. Availability of Personal Protective Equipment remained a high concern during all the three IDIs.

Sindh and Balochistan both lack pandemic preparedness plans. It was revealed from the IDIs that there is a felt need of such a plan at provincial level. This plan should have a preparedness planning committee and task force at both the provincial and district levels for the rapid and

timely exchange of human surveillance information at National and International Level, such as seasonal, ILI, SARI, etc. To address the issue of inter – pandemic surveillance, it is necessary to develop the surveillance sites, such as sentinel sits, hospital, Health Centers to detect unusual assurance of influenza or unexplained event of respiratory illness and appropriate investigation. For the surveillance of new strains of influenza various a proper mechanism with the cooperation and coordination of livestock Department should be established which specify surveillance measure during a pandemic. The strategy for the susceptible animal’s surveillance should be the responsibility of the department for sharing surveillance information, meeting between human and animal surveillance with the health department. Capacity building for Health care Provider is essential at provincial and District Level regarding the prevention and control of containment spelled out in a pandemic. At present there is no awareness and capacity of Health Care providers regarding infection control measure to limit animal – human transmission. At Present no Health care provider has been trained for the treatment of influenza pandemic in this regard a proper and specific clinical guideline for diagnosis treatment, admission and discharge criteria must be developed at provincial level for the management of pandemic influenza. It is recommended that a separate plan should be developed which specify vaccination use policy, procurement, priority groups and mask vaccination for pandemic influenza. At Provincial there is no mechanism for rapid and timely exchange of epidemiological investigations with district, National and International Level. No lab facility is available for routine Influenza testing to cater these situation a specific laboratory for diagnoses and confirmation at Provincial and District Level is needed besides that capacity building for Health Care providers, especially the lab staff for collection of human specimen handling transport and its disposal. There is no capacity of Health care provider to handle and take care of the patient during pandemic influenza. Special training is required for health care provider in provincial and district level regarding surveillance laboratory infection control. Case management and antiviral and vaccines. A proper and affective communication mechanism is required for Health and non-Health authorities for communication and information sharing between national level authorities, Regional authorities, WHO and other UN agencies and provincial and district level.

VIII. ANALYSIS OF THE SEASONAL AWARENESS AND ALERT LETTER (SAAL) DATA WITH THE FEDERAL EPIDEMIOLOGY AND DISEASE SURVEILLANCE DIVISION (FE&DSD)

The SAAL is issued by the NIH quarterly every year. It reports of 13 notifiable diseases namely: Crimean Congo Haemorrhagic Fever (CCHF), Dengue Fever (DF), Diphtheria, Gastroenteritis, Leishmaniasis, Malaria, Measles, Meningococcal Meningitis, Seasonal Influenza –A (H1N1, H5N1), Poliomyelitis, and Typhoid Fever.

The objectives of the SAAL are to alert the health authorities and professional community about epidemic-prone infectious disease in winter season, and to facilitate preparedness and response mechanisms to mitigate outbreaks and epidemics so as to reduce associated morbidity and mortality. The data for this purpose is acquired through the DEWS and the District Health Information System (DHIS). The issue also reports on the seasonal alerts of rest of the seasons apart from the winter season as spelled in its objectives.

The disease epidemiology is limited to description only as from the given information in SAAL is not enough for further analysis. Therefore, the SAAL’s issues from 2005 to 2014 were analysed for trends (time, place and person) of all the 13 diseases, which are described individually as below:

L. Crimean Congo Haemorrhagic Fever (CCHF):

The CCHF is on high alert all the year for June to September (Monsoon Season) except the years 2005, 2007, 2009-11 when it was not on high alert in the Monsoon season. It shows two peaks at the summer and at the winter Seasons times. Most of the cases of CCHF are reported and lab-confirmed from Balochistan followed by the Punjab and KP. The least cases being reported from AJ&K and FATA.

There is a mix trend of CCHF from the provinces. Balochistan has reported most cases (47) during 2011 as compared to 2010, which declined to 30 in 2012, as compared to the Punjab and KP which showed most cases during 2010 (19 and 16 respectively) as compared to 2011 and 2012. Nevertheless, there is inconsistency in published data as evident from number of cases reported in two separate graphs (SAAL's Issue March-May 2013).

M. Dengue:

Dengue has been on the high alert throughout the years except for spring-summer seasons during 2005, 2006 and 2013. By comparing the data of years 2011-13, it could be appreciated that the number of cases remained reported throughout the year but the cases hit the peak in the start of winter season. The country experienced a huge outbreak in 2011 for the Punjab province (22273 cases) with Case Fatality Rate (CFR) more than 1.5%. In 2012, the number of lab confirmed cases were 990 resulting 04 deaths with a CFR less than 1 %, while till September 2013 the number of confirmed cases increased to 9617 mostly affected KP (7559) and Sind (1749).

By analysing the data from year 2011-14, it is evident that the dengue has now become endemic in Pakistan mostly occurring during the hot and the rainy weather. The data shows that most of the cases have been occurring in Monsoon and post monsoon time of the year. Interestingly, the yearly trends show alternate high and low incidence pattern from 2011 to 2014 (2011: high; 2012: low; 2013: high; 2014: low).

N. Diphtheria

Diphtheria has been on high alert in the winter season for most of the years except for 2008 where it was on high alert in spring and summer seasons as well. Sporadic cases occurred throughout Pakistan among the low immunization coverage areas. While comparing 2012, 2013 and 2014 data, most of the cases were reported in colder months.

From 2012 to September 2013, 96 alerts were reported from all over Pakistan. Most of them were from KP (45) followed by the Punjab (32), and rest were from other provinces and regions. Out of the 67 samples taken, 5 were positive for diphtheria. During January-September 2014, 45 cases were reported. 30 samples taken and three samples was declared positive by the NIH. Most of the cases were from the Punjab (30 cases) followed by KP (11cases).

O. Acute Gastroenteritis

Acute gastro enteritis/ acute watery diarrhoea was on high alert during the monsoon for all the years. The number of suspected cases in 2012 were 30,872. 522 sample were sent and 136 were positive.

While comparing the 2011, 2012 and 2013 data, most affected province was Punjab followed by Baluchistan and KP. 80-90% of the cases were mild to moderate in nature.

P. Acute Viral Hepatitis:

Acute Viral Hepatitis was on high alert in the monsoon for all the years. For Hepatitis A, during 2010 to early 2013, most cases occurred in the age group of 20-49. For Hepatitis E outbreaks, in addition to the usual monsoon trend, the data from June 2012 to February 2013 also showed a few additional outbreaks in winter season.

Q. Influenza H5N1/H1N1:

Influenza remained on high alert for both the winter and the spring seasons throughout all the years except for 2013. There were significant more cases during the winter season of 2012 and 2013. For 2011-12, the trend of the seasonal influenza remained low and reflected the regional and global trends. By analyzing the lab confirmed cases of H1N1 from 2009 to 2014, it is evident that Influenza cases start reporting in September and peak towards the winter as it progresses further into coming months of cold.

During 2007, three cases of H5N1 and one death due to H5N1 was reported. However, the WHO declared Pakistan free from H5N1 later on.

R. Leishmania:

Leishmania was on high alert during the winter and in monsoon for 2004-2006. In 2007, it remained on high alert during the winter and the spring-summer season. From 2008 onwards, it was on high alert all the year except for 2013-2014, when it was not on high alert.

The data of 2011-2013 showed that the cases occurred during all seasons but most cases occurred during the winter season. The most affected province was Baluchistan followed by KP and FATA.

S. Malaria:

Malaria was on high alert in monsoon for all the years. DEWS for 2012 and 2013 reported a uniform trend all over the year. In 2011, 318696 lab confirmed cases were reported by Public sector. The most endemic regions were KP, Baluchistan and Sind.

T. Measles:

Measles was found to be on high alert for spring-summer season during 2004-2006, while for 2008-12, it was on high alert for spring and monsoon. For the year 2013-2014, it remained on high alert for the whole year. Data from the years 2011-2013 outbreaks during winter season. A major measles outbreak (16885 cases) occurred from September 2012 to early 2013. The CFR was 2%. All the four provinces of Sind, KP, Punjab and Baluchistan suffered from this large outbreak.

U. Meningitis:

Meningitis is on high alert for spring summer season in 2004-2007, and 2012-2013. It was on high alert during 2008's and 2011's monsoons.

V. Pertussis:

Pertussis has been on high alert in winters for all the years. In 2013, the number of reported cases were 406 and 216 sample were sent to the NIH. All the sample were found to be negative. The most affected regions were Sind and Baluchistan. The disease was at its peak in 2012 whereas, it declined during 2013 and 2014.

W. Polio:

Polio, as notifiable disease, remained on high alert during the monsoon period for the years 2006-2010 and for 2012. During 2013 and 2014 polio remained on high alert for the whole year. Comparing the type of Polio virus during 2012 and 2013, only P1 existed during 2013 where as in 2012 all the serotypes were present. The disease trend for years 2011-2014 shows that the number of cases were at peak in 2011, declined in 2012, increased to some extent in 2013, and again went at peak in 2014. The most affected region were FATA, KP and Sind.

By analysing the 2012,13 and 14 data, the number of involved district or region also increased by 24 in 2012, 93 in 2013 and 184 in 2014.

X. Typhoid Fever:

Typhoid Fever remained on high alert throughout the decade during the monsoon weather. By analysing the 2012-2014 data, there were two peaks occurring during in 2013 and 2014.

Y. The demographic and health profile of Pakistan

According to the WHO's health profile, Pakistan is a country of 179,160 people. Around more than a third of this population lives in urban setting and the rest as rural communities. There are five provinces and 144 districts with federally administered areas of FATA and AJ&K. It borders with Afghanistan on the East, India on the West, and Iran at south and China at North. It is a developing economy with steadily increasing GDP over the years. Pakistan has a population growth rate of 3.3 % with a Gross National Product (GNP) of 2880. During 2012, 55% of life lost was due to the communicable disease, higher than what is there for regional average. For every 10,000 patients, there are 8.3 doctors and 5.7 nurses. The country's per capita expenditure on health is far less than the average in the region.



Z. Figure 1. Pakistan’s district level administrative boundaries

AA. The human and animal healthcare system in Pakistan.

Pakistan’s health care infrastructure, disease surveillance and response system and laboratory capacities in both human and animal health sectors are summarized below:

17. Human Health Care System

The PHC services are provided through a well-established infrastructure of over 7500 first level care facilities and outreach services in the public sector. All vertical PH programs in Pakistan were also devolved following the 18th Constitutional Amendment. Hospital and curative care is the predominant form of health care delivery in terms of both access by the people and financial allocation by the government. There are over 1200 hospitals in the public sector in Pakistan, with over 83,000 beds available for indoor admission. Of the total health budgetary allocation (Rs. 9863 million) in Pakistan, more than 80 % (Rs. 8180 million) is allocated for hospital services (Federal Budget Allocation FY 2013-14). Pakistan does not have a national HRH development policy.

The Disease Early Warning and Response System (DEWS) with alert generation and response component along with surveillance and weekly reporting of seventeen priority diseases is being implemented in the country primarily through WHO assistance. The mechanisms for effective risk communication during a public health emergency exist, however, they need further

strengthening. WHO-EMRO team has conducted the Assessment of Public Health Core capacities requirements for the implementation of International Health Regulation in Pakistan in February 2013. A plan of action on the implementation of the mission recommendations has been developed for implementation by 2016. Public Health Laboratory competent at national level as NIH but provinces are just starting to develop their public health labs. A national working group on the IHR implementation has been notified recently.

Pakistan is committed to the implementation of IHR 2005 in the country. Currently, the laws, standing operating procedures and guidelines are in place at national, provincial and different institutional levels of health. Similarly for entry points rules have already been framed for air and sea ports which also need amendment and renewal in accordance with the IHR (2005). The draft legislation for the implementation of IHR “Pakistan Public Health (Surveillance and Response) Act 2010” needs certain amendments after the decentralization and is being revised in light of 18th constitutional amendment and necessary approval from the cabinet. A passive reporting of selected health events including seventeen communicable diseases is underway through the District Health Information System (DHIS).

BB. Animal Health Care System, Disease Surveillance and Response System

MINFAL in collaboration with United National Food and Agriculture Organization (UNFAO) have established a surveillance network of 12 laboratories and upgraded the central NARC laboratory with the components:

- establishment of Sero-monitoring Network,
- upgrading diagnostic facilities
 - Central AI-Reference Lab and 5 peripheral labs equipped with basic and advanced diagnostic equipment/material (VI, ELISA, PCR, VN),
 - disease diagnostic,
 - data processing persons and field workers trained, support development of effective vaccines and set up its testing facility,
 - impart field and lab staff training and develop awareness schemes regarding biosecurity and vaccination measures
 - Formulate National Contingency Plan for Avian Influenza.

Surveillance

A. Suspected Outbreaks.

Field samples for virus isolation or via PCR detection; typing and serology.

B. Non-Vaccinated Healthy Flocks

After every 3 months, 10 blood and cloacal samples/farm.

C. Vaccinated Flocks (Preferably sentinels are tested)

Serology and virus isolation:

- 1- Every 3 month's serology of 10 birds/farm.
- 2- Every 3 month's virus isolation from 10 cloacal swabs/farm.

AI Vaccine Evaluation

All local and imported vaccine to be evaluated for safety/potency. This is being expanded for comprehensive testing on all farms and include other issues like migratory birds.

Response

For further improvement in farm biosecurity measures and controlled culling and dumping during outbreaks, pertinent legislation would be required

CC. Animal Disease Surveillance and Response by MINFAL

MINFAL in collaboration with United National Food and Agriculture Organization (UNFAO) have established a surveillance network of 12 laboratories and upgraded the central NARC laboratory. The cost was Rs. 2,400,000 for the following components.

- Establish Sero-monitoring Network
 - Upgrade Diagnostic Facilities:
 - Central AI-Reference Lab and 5 peripheral labs equipped with basic and advanced diagnostic equipment/material (VI, ELISA, PCR, VN)
 - Disease diagnostic, data processing persons and field workers trained.
 - Support development of effective vaccines and set up its testing facility. . Impart field and lab staff training and develop Awareness Schemes regarding biosecurity and vaccination measures.
 - Formulate National Contingency Plan for AI.
2. To maintain the existing surveillance lab network including investigation of outbreaks would require Rs. 1,500,000 for recurring costs of salaries and disposables /consumables. The following activities would then continue for one year until government funding would be available.

D. Suspected Outbreaks.

Field samples for virus isolation or via PCR detection; typing and serology.

E. Non-Vaccinated Healthy Flocks

After every 3 months, 10 blood and cloacal samples/farm.

F. Vaccinated Flocks (Preferably sentinels are tested)

Serology and virus isolation:

- 1- Every 3 month's serology of 10 birds/farm.

2- Every 3 month's virus isolation from 10 cloacal swabs/farm.

G. AI Vaccine Evaluation

All local and imported vaccine to be evaluated for safety/potency

3. For expansion to have more comprehensive testing on all farms and include other issues like migratory birds, again requesting Rs. 2,400,000.
4. For further improvement in farm biosecurity measures and controlled culling and dumping during outbreaks, legislation would be required and an estimated 51,000,000, chiefly for compensation for culling and monitoring of farmers' compliance.

Detailed narrative "National Contingency Plan to Combat Avian Influenza in Pakistan" is available. Detailed budgeting is in process by FAO-MINFAL.

II. EMERGENCY MANAGEMENT AND COORDINATION OF PANDEMICS (INCLUDING INFLUENZA)

A pandemic is a national emergency. It affects all the sectors of the society and requires efforts at the national levels. It is extremely important that there is national consensus, planning and decision-making. The resultant action will determine the protection against and reduction in the total and partial impacts of the emergency/disaster in Pakistan. Strategic decisions need to be made at the federal level, however, the provincial inputs would remain extremely important. There shall be establishment of process and systems through effective co-ordination, cooperation and leadership. These processes and systems shall also require robust involvement of all the national and international organization, mandated through this plan from the federal to provincial and district levels.

DD. 2.1. Institutional Arrangements

Any pandemic (including influenza) shall be considered a national emergency. Constitution of National Steering Committee (NSC) as the highest decision making body chaired by the Honorable Prime Minister Pakistan, and members comprising of high-level decision makers from key line ministries and departments is essential for smooth implementation of the NPPP. To assist this highest body of preparedness in the country, a national group of Public Health Experts along with a National Executive Committee (NEC) comprising of heads/directors/focal points of the subordinate departments/sections of the line ministries/departments/agencies would be imperative to initiate contingency measures for prevention and response for pandemics and outbreaks. The Executive Committee will also be responsible for overseeing grass root level implementation and cross-cutting projects supporting the NPPP implementation. This committee shall remain accountable (operationally and financially, both) to the NSC for its performance in implementing NPPP.

2.1.1. National Steering Committee for the NPPP

The National Steering Committee (NSC) will facilitate the implementation of the National Pandemic Preparedness Plan. The National Steering Committee shall be chaired by the Prime Minister and shall include high level decision makers from various Ministries and entities to make critical contributions to political decision making during the three main WHO pandemic Phases.

Members:

1. Prime Minister - Chairman
2. Minister, Ministry of NHRS&C
3. Minister, Ministry MINFAL
4. Secretary, Ministry of NHRS&C
5. Secretary, Ministry of MINFAL
6. Secretary, Ministry of Finance
7. Secretary, Ministry of Information, Science and Technology
8. Secretary, Ministry of Interior
9. Secretary, Ministry of Economic Affairs Division
10. Secretary, Ministry of Education
11. Secretary, Ministry of Foreign Affairs
12. Secretary ,Ministry of Commerce and Industries
13. Secretary , Ministry of Labour and Overseas Pakistanis
14. Surgeon General, Pakistan Army
15. Chairman NDMA
16. Attorney General, Government of Pakistan

Roles and Responsibilities:

- Undertake evidence-based policy Make policy decisions for the implementation of the NPPP in view of the recommendations by the Infectious Disease Public Health Think Tank
- Mobilize required resources for implementation of the NPPP
- Endorse updating the NPPP
- Approve nominations of the lead agencies and plans to undertake in assuring WHO's three phases
- Declare different Phases of pandemic based on the recommendations of the Think Tank (may also be called as National Technical Committee) in case there is human to human transmission of infection occurs (phase 4 and beyond)
- Direct NEC to form committees and task forces as necessary.

- Ensure inter-ministerial and provincial, and inter-agency collaboration, coordination and partnership with international, regional and bilateral agencies including the World Health Organization (WHO), the United Nation’s Children Fund (UNICEF), the Food and Agriculture.

The National Steering Committee shall meet twice a year and as and when required. A simple majority of 2/3rd shall constitute the quorum for convening the meeting. The National Steering Committee shall seek technical recommendations the Think Tank (NTC).

2.1.2. National Executive Committee

The National Executive Committee (NEC) shall be responsible for providing overall guidance, direction and monitoring of the implementation of the NPPP. Further, the committee shall be responsible for overseeing the implementation supporting project and shall be accountable for all the progress and financial aspects of the implementation of the NPPP.

Members:

1. Director General, Ministry of NHR&C, Chairman during human phase.
2. Director General, MINFAL, Chairman during animal phase
3. Executive Director, NIH , M/o NHR&C, member
4. Director General, National Health Emergency Preparedness and Response Network, M/o NHR&C, member
5. Director, National Disaster Management Authority, member
6. Rep Pak Army GHQ (Brig)
7. Director, Ministry of Education, member.
8. Director , M/o Interior, member
9. Director , M/o Commerce and Industry, member
10. Rep, WHO, member ex-officio
11. Rep UNICEF, member ex-officio
12. REP OCHA, member exofficio

Roles and Responsibilities:

- Review and update the NPPP from time to time;
- Keep the NSC updated on new developments of the epidemic worldwide and nationally;

- Develop guidelines, protocols and procedures for implementing the NPPP;
- Initiate activation of National Incident Command Centre for response to AI outbreak in birds and/ or humans.
- Recommend import/export bans of poultry, poultry products and other risk goods for prevention of incursion and/or spread of Influenza virus into and within the country. The recommendations should be scientific evidence-based and be decided in collaboration with other relevant stakeholders
- Designate sectoral media spokespersons for risk communication, one each from MoH and MINFAL; In case of public emergency, consult with the National Steering Committee and the Cabinet Secretariat to appoint a Spokesperson.
- Endorse press releases and briefings prepared by each concerned Ministries (in case of avian influenza – MINFAL and in case of human influenza – MoNHSR&C) for dissemination to the public;
- Identify the inter-sectoral lead agencies for effective implementation of the NPPP;
- Ensure the adequacy, timeliness and relevance of communications activities.

IX. FREQUENCY OF MEETINGS AND QUORUM

The Executive Committee for the NEPPP shall meet quarterly or as and when required. The committee will also meet as and when there are outbreaks in neighbouring/trading countries to decide on bans and other regulatory issues or when there are serious public health threats. A simple majority shall constitute the quorum and as far as possible all the members shall be present. In addition, technical experts shall be invited for the meeting.

2.1.3. Coordinated Incident Command Structures

The ICS shall follow with Health and MINFAL agencies as lead agencies along with the Disaster Management Authorities as co-chairs for coordinated response through all the essential government agencies, and essential international organizations such as WHO and FAO. The Incident Command Structure for medical and veterinary response to avian and human The Incident Command System is given as per figure below:

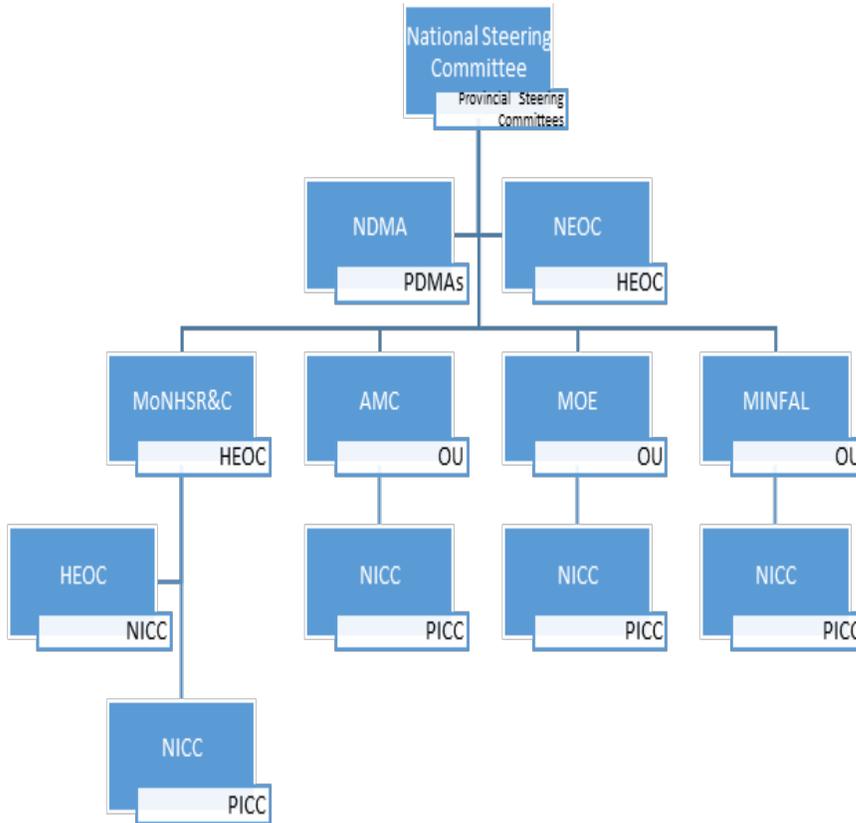


FIGURE 2. EMERGENCY COORDINATION AND MANAGEMENT STRUCTURE FOR PANDEMIC PREPAREDNESS AND RESPONSE.

With adoption of the NDMA Ordinance, NDMA would co-ordinate integration of pandemic influenza prevention, preparedness and response with existing disaster management frame work at community levels. This would include a co-ordinated mechanism for health and sectors beyond health for maintaining essential services and continuity of operations. The NDMA would monitor the progress of the pandemic and the impact of the mitigation measures in health and sectors other than health in close coordination with the M/o NHSR&C and its designated Cell.

2.2. Intersectoral Response

Each Government Ministry or Agency, informed and directed by the NEC is a lead institution for leading planning, preparedness and response in the sectors it serves. Ministries and agencies also play an important role in intelligence and surveillance among their sector institutions: for example by tracking workforce or student absence at schools, movements at the border and impacts on the economy and critical infrastructure. For this purposes of emergency management, it is important that Ministries and Agencies, responsible for, carry out these responsibilities in a well co-ordinated fashion. Intersectoral response is critical during Pandemic Phases 4, 5 and 6, when there is rapid human-to-human transmission that involves nationwide and whole-of-society preparedness.

The National Steering Committee engages with the wider government sector through the InterMinisterial Task-Force in Multi-sectoral Pandemic Preparedness (IMTF), which provides technical and communication support among sectors. The National Steering Committee is to ensure coordination among all essential sectors identified below:

Lead agencies are agencies that have a mandate (through legislation or agreed authority) for the control of an incident. A lead agency monitors and assesses the situation, co-ordinates national support, reports to the NSC and the NEC and provides policy advice. In a national emergency, the lead agency directs and manages the operational responses of its sector as necessary.

10 essential sectors along with Lead Government Agency are identified as follows:

Healthcare (Ministry NHR&C)

- Food and Fuel Supplies (MINFAL)
- Budget and Finance (Ministry of Finance)
- Law and Order (Ministry of Interior)
- Power and Electricity (M/o Power and Development)
- Transportation (Ministry of Communication)
- Telecommunication (Ministry of Information Technology)
- Education (Ministry of Education)
- Water and Sanitation (M/o Climate Change and M/o Local Government)
- Private Sector and Donors (Chamber of Commerce and Industry, Ministry of Economic Affairs)

Risk analysis

Any pandemic poses a major risk to the health and allied workforce. Fear to get sick or die in case of highly infective infectious disease may lead to absenteeism. This should be addressed in contingency plans of all the agencies, and need to develop measures for PPEs and reassurance of the workers with all the medical help at hand to protect and treat the handlers.

2.2.1. Lead agencies

It is imperative to identify lead agencies according to the nature and scale of the disaster. The lead agencies and other participating agencies must have excellent coordination and collaboration to deal with a pandemic.

Contrary to the natural disasters where the NDMA and PDMA should be the lead agencies, a pandemic requires the Ministry of Health (M/oNHR&C) through its designated offices (NHEPRN/NIH/EPI) and MINFAL to be the lead agencies. These lead agencies shall work through their counter parts in the provinces and districts. The NDMA and designated local Emergency Operation Centers (EOC) have responsibility for, and are critical to, the management of emergencies in the community.

2.2.1.1. Ministry of National Health Services Regulation, Coordination (M/o NHR&C) as lead agency

In a human disease epidemic or pandemic, the Ministry of NHR&C will be the lead agency through its NHEPRN/NIH/EPI. The Ministry has already taken a lead role in planning for an influenza pandemic, and this role would continue into the response phase of a pandemic.

2.2.1.2. MINFAL as lead agency

For an animal disease, whether epizootic or panzootic (the animal health equivalents of epidemics and pandemics respectively), MINFAL will be the lead agency. If a human contracted the disease as a result of handling affected animals, MINFAL would continue as lead agency, working closely with the Mo NHR&C on the risks associated with the human case or cases and possible human-to-human transmission.

EE. Preventing disease spread to humans

Where ever human-to-human transmission of an animal disease is apprehended in the country and there is an indication of possible pandemic spread, the Mo NHR&C becomes the lead agency for managing the pandemic. The MINFAL would, however, continue with incursion response activities, if there was disease in animals. Additional roles of MINFAL would have in any pandemic situation includes assisting the MoNHR&C with laboratory testing, where required.

2.2.1.3 National Disaster Management Authority

The role and responsibilities if the NDMA and PDMA is already described above.

2.2.2. Sectoral Response

I. Healthcare

FF. Central Government agencies: Ministry of National Health Services, Regulation and Coordination (lead)

Other agencies: National and regional tertiary care hospitals, District Headquarter Hospitals, Rural Health Centers, Basic Health Units (BHUs), City Corporations, Municipalities, District administrations, Police and Armed Forces.

Critical Interdependencies:

Transport (for movement of supplies, personnel, patients and deceased bodies), Telecommunication (for patient care and emergency), Energy (power supply, clinical, mortuary and security systems), Water (healthcare facilities, hygiene), Pharmaceuticals (consumables and treatment of patients), Finance (Ensure medical supply chain)

Roles and Responsibilities:

GG. Ministry of NHR&C and Provincial Ministries of Health

- Provide un-interrupted health care services
- Adequate supply of drugs, reagents and other necessary medical supplies
- Adequate supply of health staff

- Monitor and minimize the effects of pandemics
- Develop public awareness and risk communication materials
- Train other non-health sector staff and provide necessary information to other sectors
- Establish appropriate communication channels with other sector institutions

X. CITY CORPORATIONS, MUNICIPALITIES AND DISTRICT ADMINISTRATION

- Support to pandemic intelligence and surveillance at municipality and community
 - Support to health care sector and medical logistics
 - Support in removal, mortuary and burials
 - Provide ritual services during mass death
 - Provide psycho-social support through religious proceedings (Khatam e Quraan and Dua)

II. Food and Fuel Supply

Central Government agencies: Ministry of MINFAL and Ministry of Petroleum and Natural Resources

Other agencies: Ministry of Finance, Ministry of Information Technology, PARC, Ministry of Interior (Crises Management Cell) and Law enforcement agencies, Food and Agriculture Organization

Critical Interdependencies:

Transport (for movement of food and supplies), Energy (power supply, industrial production), Water (drinking and agriculture), Finance (Ensure trade transactions),

Roles and Responsibilities:

HH.

Ministry of Economic Affairs Division

- Ensure Liaison with the International community and partners for securing funding and cooperation.

III. Law and Order (including Immigration)

Central Government agencies: Ministry of Interior **Other agencies:** Ministry of Defense

Critical Interdependencies:

Transport (for movement of personnel and equipment), Telecommunication (for emergency communication), Energy (power supply and security systems),

Roles and Responsibilities:

IV. Finance and Insurance

II.

Central Government agencies: Ministry of Finance (lead)

Other agencies: Royal Monetary Authority (RMA), Banks and Insurance Companies

Critical Interdependencies:

Transport (for movement of cash and personnel), Telecommunication (for financial and insurance transactions), Energy (power supply for banking and insurance services),

Roles and Responsibilities:

JJ.

Ministry of Finance and Baitul Maal

- Analyze and advice on potential financial implications related to a pandemic
- Maintain continuity of uninterrupted collection of revenues and taxes
- Timely fund transfer, treasury operation, availability of public funds for emergency
- Establish appropriate communication channels with financial sector institutions
- Plan for implementation of price control strategies on food, medicine, fuel and other essential goods and establish trigger points for the implementation of these strategies.
- Advice in implementation of price control to MoF
- Ensure fund liquidity and operational continuity of financial institutions during influenza pandemics.

KK.

Banks

- Provide necessary uninterrupted banking services to the public, including sufficient liquidity management.
- To ensure that the flow of credit and finance in the economy so that the flow of other essential services will not disrupted.
- Maintain operational continuity of ATMs for potential social distancing measures

V. Power and Electricity

Central Government agencies: Ministry of Water and Power

Other agencies: IESCO and NDMA

Critical Interdependencies:

Transport (for movement of staff, equipment and supplies), Energy (power supply and industrial production), Water (drinking and agriculture), Finance (Ensure transactions), Trade and Supply (import of supply and equipment)

Roles and Responsibilities:

VI. Transportation

Central Government agencies: Ministry of Communication

Other agencies: National Highway Authority, Highway and Motorway Police, Public and Private transportation companies .Railways and Air lines

Critical Interdependencies:

Fuel Supply (air and road transportation), Telecommunication (for operations), Energy (power supply), Finance (Ensure supply of equipment and commodities)

Roles and Responsibilities:

- Advise on measures to mitigate impacts on transport measures
- Establish appropriate communication and coordination system with transportation sector institutions
- Make a decision to limit or halt international and local air and road transportation
- Provide advice on safety and security to air and road passengers with support from MoH
- Facilitate and make necessary arrangement on air transportation of essential supplies, including drugs, medical supplies, technical assistance and etc.
- Ensure border safety and control measures together with Ministry of Interior, and M/o NHR&C (CHE).
- Maintain business/operational continuity among national transportation companies

VII. Telecommunication

Central Government agencies: Pakistan Telecommunication Authority

(lead)

Other agencies: Public and private telephone and Cellular Companies. PTMA

Critical Interdependencies:

Transport (for movement of supplies, personnel, patients and deceased bodies), Health (for staff safety), Energy (power supply for telecommunication), Essential Supply

Roles and Responsibilities:

LL.

PTA

- Ensure policies for uninterrupted essential communication services across the country.
 - Establish appropriate communication and coordination system with communication sector institutions
 - Maintain business/operational continuity among telecommunication companies
 - Coordinate with private communication and media providers on facilitation of dissemination of awareness and public information resources.
 - Develop and establish emergency telecommunication plan for the sector.
- #### **Telecommunication companies**
- Ensure continuity and timely restoration of provision telecommunication services to critical services, such as hospitals, emergency, infrastructure and communication sectors, and general public.
 - Strengthen internal resilience towards potential disruption of communication services.

MM.

Media

- Provide support to national authorities on provision and dissemination of accurate, unbiased and timely public messages.
- Ensure safety and security of media staff.

VIII. Education

Central Government agencies: Ministry of Education (lead) **Other**

agencies: Public and Private School and Colleges Professional Bodies, Ministry of Social Welfare

Critical Interdependencies:

Transport (for movement of supplies, teachers and students), Telecommunication (for emergency and surveillance), Energy (power supply to schools), Water (healthcare and hygiene), Food and essential commodity supply

Roles and Responsibilities:

NN.

Ministry of Education

- Coordinate the response for education sector among schools and institutions
- Organize public awareness campaign in the schools with support from Mo NHR&C
- Draw up a plan of action on pandemics, particularly on risk communication, surveillance and communication to relevant health authorities
- Advice on closure of schools to local administration and authority
- Develop alternative home-based learning methods, in case of school closures
- Provide psycho-social counseling and support to children in need
- Instruct mobilization of teachers and students for certain activities/programmes **Schools**
- Immediately inform local health authorities on possible symptoms of influenza pandemic
- Consult with local authorities on closure of schools
- Develop plan of action on measures to be taken at school level

- Restrict unnecessary social activities to reduce human to human contact

IX. Water and Sanitation

Central Government agencies: Ministry of Local Government **Other agencies:** Ministry of Health (Provincial), M/O NHR&C, Ministry of Climate Change , Municipalities and District Administration

Critical Interdependencies:

Transport (for movement of supplies, personnel, patients and deceased bodies), Telecommunication (for patient care and emergency), Energy (power supply, clinical, mortuary and security systems), Education (public awareness), Healthcare and mortuary

Roles and Responsibilities:

- Ensure adequate legal and regulatory framework is in place to allow for water rationing and distribution during pandemic, giving priority to health facilities
- Stockpile essential materials and supplies to ensure safe water provision during the initial and subsequent waves of influenza pandemic.
- Review equipment maintenance schedule and operational continuity.
- Review water treatment protocols to ensure that chlorination practices are appropriate.
- Maintain appropriate storage and delivery of water in case of pandemics
- Maintain appropriate drainage and waste water removal procedures
- Create awareness on water and hygiene safety during influenza pandemic

X. Private Sector

Central Government agencies: Ministry of Commerce & Chamber of Commerce and Industry (lead)

Other agencies: Ministry of Finance, Federal Bureau of Revenue , Ministry of NHR&C, Private sector companies

Critical Interdependencies:

Transport (for movement of supplies, personnel and goods), Telecommunication (for operation and emergency), Energy (power supply for industrial and service purposes), Health (healthcare services and facilities), Finance and Insurance (Ensure procurement and trade), Law and Order (safety of businesses), Water and Sanitation (health in workplace)

Roles and Responsibilities:

- OO. Chamber of Commerce and Industry**
- Consult with national authorities on measures to be taken on workplace to ensure safety among employees
 - Consult with national authorities on measures impacting economy and business activities, such as border control, trade restriction due to movement, shortage of supply and discuss on potential facilitation on businesses.
 - Raise awareness among the private sector on business continuity during pandemic outbreaks and what measures to take on workplace
- PP. Private Companies**
- Large companies to develop their business continuity plans to ensure operational continuity with limited staff and resources.
 - Put in place measures to ensure safety and security of employees.

2.3. International Organizations

Pakistan has seen several natural and man-made disasters in the recent couple of decades. The role of the international humanitarian agencies, partners and donors has always been enormous and commendable. Nonetheless, the assistance of the international agencies is usually required in the level-3 and above, their involvement in preparedness and being on various humanitarian clusters along with the government agencies is essential for an organized response to any emergency situation.

XI. WHO HEALTH ORGANIZATION (WHO)

World Health Organization (WHO) provides technical assistance to the country, and sits in the health and nutrition cluster as co-chair. It helps in terms of preparation and implementation of the National Influenza Preparedness and Response Plan and Health Emergency Plans and for prevention and control activities of influenza pandemic. WHO is a global body to trigger and announce the pandemic Phase system. M/o NHR&C has the mandate to report outbreak cases to WHO through International Health Regulations (IHR) mandates. WHO provided a support in supply of medical equipment, rapid test kits, antiviral, vaccine, PPE kits, and emergency kits.

XII. FOOD AND AGRICULTURAL ORGANIZATION (FAO)

FAO has their presence in Pakistan and it works closely with the MIFAL. It works through the MINFAL for provision of food etc. to the government.

XIII. UN CHILDREN'S FUND (UNICEF)

The UNICEF supports in developing national communication strategies, behavior and social change and developing toolkits and manuals. Also it helps in waster, sanitation and hygiene. With the help of the UNICEF, the risk communication strategy is in the process of development in Pakistan.

III. HUMAN HEALTH: INFLUENZA PANDEMIC PLANNING

The pandemic planning corresponds to the WHO's six pandemic phases (Annex-II). These phases can be categorized into two broad phases: preparedness phase and response phase. Phases 1–3 correlate with preparedness, including capacity development and response planning activities, while phases 4–6 are pertinent to response and mitigation efforts. Accordingly, the preparedness and response actions are grouped by pandemic phases which are further categorized into four components as follows:

1. Planning preparedness, coordination and communication (behavioral change measures)
2. Surveillance and monitoring
3. Health care capacity planning
4. Public Health measures and other general measures

Planning and coordination: efforts is to provide stewardship, leadership and coordination during the time of response to a pandemic.

Surveillance and monitoring: is to carry out routine monitoring of influenza/influenza-like viruses circulation in local communities, and to provide baseline data to establish seasonal trends and detect unusual clusters of influenza-like illness, and to rapidly investigate and evaluate outbreaks. The NIH's surveillance system picks-up most of such trends yet it needs to be more on active surveillance side.

Health care capacity planning: The aim is to increase the surge capacity of the health system, develop hospital preparedness plans, regular trainings and mock exercises, and make use of other facilities for back-up of the hospitals. Further, health human resource in case of a pandemic should also be taken care of, and backed with trained personnel. For example: Influenza illness may be managed in three settings, depending on the volume and severity of illness. Severe illness must be managed in hospital settings to the extent possible. Excessive cases of less severe illness can be managed in secondary health care sites (schools, etc.), while mild illness should be managed through home health care. Planning for an emergency increase in the number of health care settings is necessary in anticipation of a possible highly virulent novel virus.

Public Health Measures: are done to reduce the spread of disease and its impact. In the absence of vaccination, there are essentially two measures to reduce transmission and morbidity/mortality due to influenza virus: social distancing and the use of antiviral drugs. Social distancing requires public health education to effect behavioral changes and regulatory authority, while the use of antiviral medication requires health care facilities, especially for the treatment of seriously ill patients. Health systems will need to provide health care services during a pandemic and plan for a surge capacity to manage the additional patient load. Personal hygiene practices and mass vaccination would be required.

3.1. Objective

To strengthen surveillance and early warning system and response to pandemics/influenza pandemic,

1. To prevent influenza pandemic/other pandemic infections in human and to rapidly control and contain the spread of pandemic viruses,
2. To minimize morbidity, mortality and social disruption due to pandemic/influenza pandemic by timely and effective response,
3. . To monitor and evaluate the response capacity by human health sector.

In order to achieve the above objectives, the following key strategies and activities shall be implemented by the health and allied sectors for prevention of infection during the pre-pandemic phase and during the active response phase of the pandemic, and to minimize the scale of the pandemic, and potential socio-economic disruption.

It is desirous that for planning for pandemic, scenarios should be discussed. Planning for each scenario is different at the response phase. However, for preparedness, there is no difference in planning phases and it is the same for all the three phases. Nonetheless, in each case, it is clear that the risk of acquiring a new pandemic virus is not homogeneous across the general population.

3.2. Pandemic Preparedness Strategies – Preparedness Phase

3.2.1 Planning, coordination and communication (behavioral change measures)

The purpose of these activities is to ensure that all the required resources, expertise and services can be mobilized and deployed rapidly to reduce the morbidity, mortality and social disruption to the minimum. In addition, establishment and strengthening of core capacities to preempt and control the next pandemic would also be useful in dealing with other infectious disease epidemics and public health emergencies of international concern as required under IHR (2005). A better preparedness leads to a better response.

For planning and coordination along with timely communication, so that when there is a pandemic, an explicit chain of command and incident command structures for influenza pandemic/pandemics is instituted. The standard operating procedures (SOPs) have also been developed for rapid response teams for responding to pandemic, and every agency and individual involved in crisis management are fully trained and fully equipped to be in action in a very short period of alertness.

There is need of having a committee which keep vigilance of pre-pandemic phase (in an absence of a pandemic). This committee will provide day-to-day technical advice, direction, feedbacks and technical backstopping to the National Steering Committee and the Executive Committee. During pandemic phase (during outbreak time) this committee members shall join either National Incident Command Center or Incident Operation Center (Rapid Response Teams) as appropriate.

Members of the vigilance committee

- Technical Focal Person, M/o NHR&C
- Chief Surveillance NIH, M/o NHR&C
- Director, NHEPRN, M/o NHR&C
- Director EPI, M/o NHR&C
- Director NDMA
- Medical Specialist, Federal Tertiary Care Hospital
- Infectious Disease Specialist, Pak Army
- Director Ministry of Education
- DIG, Police

- Focal Person, IHR/EIC, NIH
- Focal person Communication , M/o NHR&C

Roles and responsibilities

- Develop guidelines, protocols and procedures for implementing the NPPP;
- Support rapid response and systematic management of outbreaks of H1N1/H5N1infection and other influenza pandemics
- Provide day-to-day scientific advice, direction, feedbacks and technical backstopping to the National Steering Committee, the Executive Committee, the Rapid Response Teams at field level and the Program
- Provide a scientific basis for risk communication and other relevant information dissemination
- Analyze and provide expert clinical, virology, and epidemiology advice/opinion.

A clear cut Command-and-Control system is established for smooth flow of information and rapid response teams have been formed for imminent pandemic as follows:

3.2.1.1. Incident Command (IC) for pandemic response

The Incident Command (IC) is the overall controlling and coordinating structure. The incident command allows smooth flow of information from the center to the incident area and receives critical information from the area through the rapid response teams or community. The IC also incorporates the NDMA along with other important stakeholders. This arrangement is necessary to facilitate activities in the field, and for continuous feedback to the NSC and the Executive Committee.

Figure 3 gives an outlay of this arrangement along with information flows depicted in arrows. The composition of the team, roles and responsibilities and their modus operandi are described under respective heading:

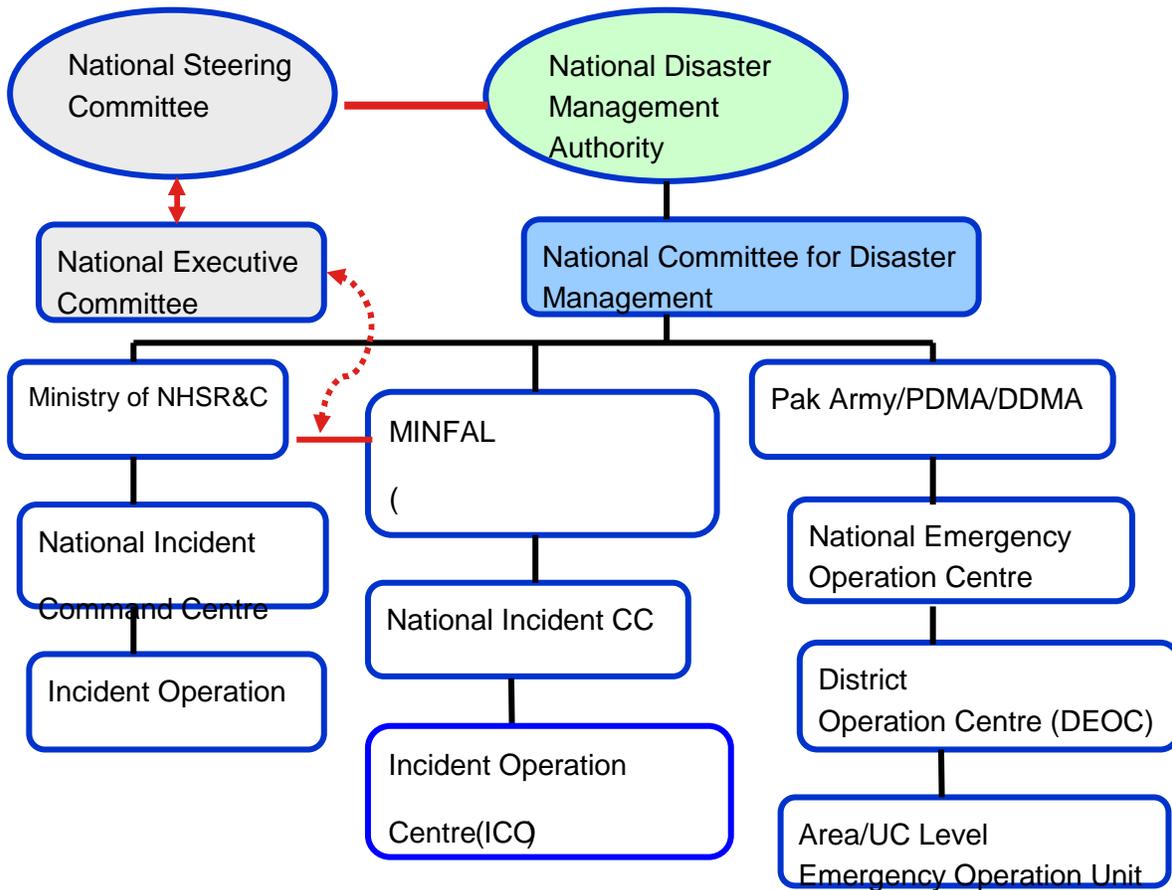


Figure 3: Incident Command for response to pandemics and linkages with National Disaster Management Framework.

3.2.1.2. Grass-root level operability

It is imperative that in view of the post 18th amendment scenario, provinces and especially districts are empowered as well as accountable for their performance so that the overall preparedness and response mechanisms achieve desired standards. In addition to the national pandemic plan, district should develop district specific pandemic preparedness and response plan with clear strategies for district level preparedness and response to influenza pandemic. A model guideline for development of district pandemic plan would be developed at the national level. Three regional workshops would be conducted for District Medical Officers and District Health Officers to help them develop their own district plan. The budget for implementation of district pandemic plan will be met and incorporated into the district yearly budget proposal.

These plans will be assessed, monitored and evaluated against set standards for their operability and quality at national as well as at district levels. The usual and recommended method is to

conduct periodic table top and field simulation exercises at least twice a year and plans need to be adjusted accordingly.

3.2.2. Surveillance, Early Warning and Monitoring

The EIC of the NIH, along with the provincial labs does this job. There is a need to update this system to the international levels and strengthen the provincial and area labs. The structure of DEWS is withering. Robust surveillance can provide us early warning system, detecting initial routes of the virus transmission and guide how to control it. Routine monitoring of influenza circulation in local communities provides baseline data to establish seasonal trends and detect unusual clusters of influenza-like illness. This is working at present but with limited surveillance sites and capacity. In addition to this, any mutated influenza virus and its circulation would remain undetected as the system is not sensitive enough.

a. 3.2.2.1. Rapid Response Team

In order to ensure early detection, control and containment of the disease, Rapid Response Teams (RRTs) would be formed at national (level-3), regional/provincial (level-2) and at the district levels (level-1). All of these teams will be activated based on the level of the trigger. As a rule, the district level team is the first responder in any case, which would assess the scale of the emergency and call upon the activation of level 2 or level 3 teams. The national RRT will be composed of relevant officials and experts from Ministry of National Health Services Regulation and Coordination (NIH, NHEPRN, and EOC/EPI), Army Medical Corps and the NDMA. Relevant hospitals and this team will also function as Federal Areas RRT. The relevant experts from national RRT will provide technical backup to the other regional/provincial RRTs as and when required. The four provincial RRTs will be composed of experts from the EPI and CDC departments, major hospitals of civil and Pak Army, and the PDMAs. The provincial RRTs will provide technical backup to the district RRT during the disease outbreaks and pandemics as and when requested by the districts within their regional jurisdiction, in addition to triggers as described above. Provincial and district DEWS of the WHO will also be part of the teams. During the initial phase of the disease outbreak the district RRT will be deployed to the incident area for initial investigation, assessment and verification, and based on the information collected from the incident area concerned provincial RRT and national RRT will be mobilized for additional support for the control and containment of the disease outbreak.

The Rapid Response Team will ideally consist of the following experts:

- District Health Officer (Team Leader)
- CMO of the CMH (in cases of cantonments)
- Epidemiologist or medical officer
- DEWS officer
- Medical Superintendent at hospital
- Head Nurse of the hospital
- Laboratory technologist/technician
- BHU/RHC In-Charge, incident area/district

Other expanded members during pandemic phase 3 and above for rapid containment:

- District Coordination Officer and law enforcement agencies
- Local commander of the Army
- EDO Education
- Communication Officer
- Local representative of the community

Ideally, during the incident of a pandemic outbreak, there will be five sub team of the RRTs. They are: Disease Investigation and Surveillance Team, Medical and Quarantine Team, Logistic Team, Information and Communication Team, and Law and Order Team consisting relevant members from national, regional and district levels (including BHUs). All these RRT members would be trained six monthly on their roles and responsibilities as per the SoPs and guidelines, and will have table –top exercises and simulation drills one a three months’ time. These teams will have preparedness and response plans based on the evidence, and on the trend of epidemics and models/scenarios for a pandemic such as influenza pandemic.

3.2.2. Health Care’s and Health System’s Surge Capacity Building Planning

Health care level and the health system’s level of involvement depends upon the severity of disease. For example: mild influenza illness can be taken care of at the primary healthcare and at the household level, moderate one at the secondary healthcare level and severe forms at the tertiary healthcare levels. The secondary and tertiary care hospitals need improvement in their surge capacities and timely referral from the secondary care level hospitals lest their cases start getting worse and need urgent referrals. The tertiary care hospitals therefore need to have 20% of their bed capacity for their own cases plus 10% for any overflows from the secondary care hospitals.

In addition to the above, several government building such as schools and district administration can be used to accommodate any overflow of mild cases. These building should be already identified and mapped to manage excessive cases of less severe illness during large scale pandemics. These structures should have all the basic hygiene, food and nutrition, and basic health facilities for both the patients and the health care providers. In cantonment areas, where the CMH/MH is functioning, they will also improve their bed surge capacity assist the civil hospitals in containing and treating the disease outbreak.

In order to implement the plan at district level, it is necessary to allocate specific budget for disease outbreak containment as part of the regular budget or under the head of emergency fund for disease outbreak. The catchment hospital should provide logistic and technical support to the health set-ups in schools and other buildings, if required. Any surge in financial demand will be taken care by the Provincial government through its own emergency funds. The armed forces hospitals would manage funds fom their own budgets and would have the similar and coordinated arrangements for containing the pandemic.

During the large-scale pandemics, hospitals should develop a comprehensive hospital contingency plan emphasizing following detailed interventions at the hospital:

- The hospitals, in addition to their protocols given at Annex-II, have clear plans to discharge all patients except severely ill one if surge capacity is required for acutely ill patients with Severe Acute Respiratory Illnesses. Hospitals should have a minimum storage of antiviral (oseltamivir) in order to treat the severe cases suffering from the influenza A virus.
- Should have clear SoPs to readily distribute the antiviral medicines to the secondary level of care on a short notice and keep a record of inventories should there could be a stock-out position at the lower healthcare level.
- In addition to the antivirals specific to the virus, plan for the increased need for antibiotics, antipyretics, hydration, oxygen, and ventilation support should be there, such as:
 - Identification of sources for obtaining required logistic support (supplies and equipment).
 - Maintaining a record of acute care beds and ventilators, and plan for any surge in their need identifying possible back-up from closely working national institutions (e.g. Army Medical Corps)
 - Establishing and maintaining an inventory of basic needs for delivering health care in secondary sites (schools, local administration buildings), e.g., cots, mats or pallets for the floor, basic hygiene supplies (soap, toilet paper), linen and masks (also in PPEs).
- Maintaining required supply of PPEs to provide to additional health care workers when they are mobilized. Limited supplies of PPE should be reserved for health care workers caring for seriously ill patients. The personal and community infection control measures must be followed while disposing off any PPEs (National Hospital Waste Management Guidelines to be followed).
- Maintaining a complete record of health care workers, e.g., physicians, nurses, lab technicians, etc.

3.2.2.1 Surge Capacity – demand of the healthcare force, facilities and other essentials

An influenza pandemic, for instance, leads to an increased demand of additional health care workers, isolation wards, ICUs, and other health care facilities, and supplies. An emergency is merely an upscale of the routine work. All efforts should be made to continue essential services during the pandemic influenza period. However, in a pandemic, there is a great likelihood that the operational capacity of a hospital may diminish due to staff illness (estimated at 20%), due to absenteeism and, therefore, it is critical to identify first- and second-line staff to ensure continuation of essential services. In addition to identifying the first and second-line staff, It is also important for hospitals

to identify critical functions that will need to continue during the pandemic (for at least 4–6 weeks), and those who will perform those essential tasks. The non-essential functions also need to be identified as they would be required to be suspended for time being. A roster of such critical staff should be maintained at all levels of the administrative structure of the national, provincial and district. A very good health human resource can be the list of retired health workers that should be maintained with the Pakistan Medical and Dental Council, Pakistan Nursing Council and at the M/o NHR&C at the national level, and ministries and departments of health in the provinces.

3.2.2.2 Capacity development in handling the pandemics

Regular trainings of the health workers and laboratory personnel on AI/H1N1/pandemic influenza prevention, control, rapid response, investigation and containment, clinical management and infection control, and also on different laboratory aspects like biosafety, and safe handling of specimen (collection, storage and transportation), is essential. They should also be trained on proper use of PPE and infection control. The laboratory staffs should be regularly trained on sample collection, storage and transportation, and other diagnostic tests including rapid test, IFA and RT-PCR techniques. In addition to this, protecting oneself and the others in conjunction with the treatment with medicines and practicing public health measures would be an important aspect of the trainings. Mock exercises and hospital-based simulation exercises are mandatory. All these training must include updated knowledge and current evidence and guidelines in dealing with the influenza and other pandemics.

Apart from the doctors, nurses and paramedics, hospital support staffs such as ward boys, janitorial, drivers, and other helpers should also be given regular trainings (twice a year) on basic infection control, PPE use, disinfection and decontamination, handling of sick person and dead bodies. They must also be trained in disposing off the risk waste, and discarding the PPEs after use in a safe manner according to the guidelines of health care waste management.

There are a number of guidelines developed by the WHO and CDC, and the adapted ones by the country, on the avian influenza, healthcare waste management and infection control to train the hospital staff:

1. Influenza clinical management and treatment guidelines
2. Surveillance guidelines
3. Infection control guidelines
4. Hospital waste management rules 2005, and guidelines
5. Lab specific guidelines for handling, storage and transportation of specimen
6. Environment management system guidelines

Regular trainings of all the cadres of the health care and at major hospitals is mandatory. NHEPRN together with the Health Services Academy would be mandated to conduct these trainings.

Annex-II: Pandemic Preparedness Plan for a hospital and Annex-III hospital preparedness plan checklist (WHO EURO)

3.2.2.3. COMMUNITY PREPAREDNESS

Community preparedness is the key stone in the building blocks of a preparedness plan. A community and local NGO-based set-up under the NDMA/PDMA/DDMA would be formulated. This arrangement would be used for prevention and control of pandemic influenza at the community level. The committee members would be trained on different aspects of pandemic influenza like community mobilization during pandemic, preventive measures, control strategies and also in providing basic non-health care to the less severe ill patients in the secondary health care sites. They can also render support during rapid containment operation in terms of logistic supplies and risk communication activities. Once properly trained, they can be actively involved in home care, delivering food, or providing other social needs to families in self-imposed isolation or quarantine. The newly emerging concept of 'Medical House Arrest' (for Ebola outbreak recently) can be used for quarantine at the community level.

QQ. Stockpile of Antiviral drugs and Personal Protective Equipment

18. Antiviral

All the respective Ministries of Health and M/o NHR&C/CADD would arrange a basic stock pile of Tamiflu capsules in the country at their major EPI stores and major hospitals as national stockpile. In addition, all district hospitals and BHU/RHCs would also be supplied with a limited stock of antiviral Tamiflu. In case of emergency requirement of additional Tamiflu in district during influenza outbreak/pandemic, the regional referral hospital will make temporary supply to the district as per the requirement by the district which will be later replenished by the national stores at the federal level from the national stockpile, and from the stores of the WHO and other partners. Additional antiviral shall be requested from the WHO regional stockpile through WHO country Office during the outbreak as per the official arrangement made by the Ministry of National Health Services and Regulation and Coordination. The Pakistan Army will arrange the medicine on their own and will be compensated from the national stores in case of any outbreak/pandemic beyond their surge capacity.

3.2.3.4.2. Personal Protective Equipment (PPE) and masks

Similar to the case of the antiviral medication described above, the responsible departments/ministries would also make good arrangements for the PPEs for the staff of the hospitals and the healthcare workers including ones conducting the outbreak investigation, and responding to it. During the influenza outbreak, if the situation demands additional supplies, the emergency funds will be used after the approval of the competent authority or may be brought into the notice of the NSC for urgent intervention. Necessary equipment and supplies such as gloves, face mask, laboratory reagents, disinfectants, medicine etc would be procured as per

prescribed procedures for disasters and emergencies. The Pakistan Customs would facilitate in relaxing the rules as mandated for such mass measures, when and where required. For the increased need of antibiotics, antipyretics, ventilation and hydration during pandemic, the ministry/department will stockpile it at the EPI stores (if scientifically appropriate) and at their central dry stores.

3.2.3.4.3 Treatment of Acute Influenza (Influenza A) cases

In cases of Acute Influenza attacks, and when there is either no or minimal herd immunity against the IA, Tamiflu is used to treat those with flu symptoms as well as to reduce the chances of getting the flu if there is a flu outbreak. All suspected cases of influenza will be treated in the local hospitals and therefore all hospitals should identify rooms for treatment of cases in isolation with their potential to take more patients (surge capacity) up to 20% of the available capacity.

The usual dosage used in patients with flu like symptoms suspected of having pandemic influenza, Tamiflu is administered in a dose of two 75mg capsules a day, as a single or two divided doses of morning and the evening [BD] (adults dose: 150mg/day) for 5 days. For a greater effect, the drug should be started within 48 hours of onset of symptoms. During a pandemic situation, the possibility to test individual patients for influenza infection will be limited and therefore treatment should be given immediately if possible, in any suspicion of the IA. In order to reduce resultant mortality, it is advisable to start each suspected case on the therapy till the availability of the lab results.

It is important to remember that the drug should only be used to treat the cases with symptoms and NOT to treat all possible or non-ill contacts of the cases. During a pandemic it is absolutely not feasible to treat every post exposure on the basis of the fact that s/he was exposed. However, there are some high-risk groups which could be the candidates for the chemoprophylaxis as described later in this text. Adult vaccination against the Influenza A should be considered to increase the herd immunity levels of the populations along with other Public Health measures as described in the next paragraphs.

3.2.3.4.4 Prophylaxis

RR. Chemoprophylaxis: Post exposure therapy of the selected high-risk groups (greens: fear of becoming yellow or red)

Chemoprophylaxis can be used for close contacts of the cases. There is need to use this with caution as sparingly use of the medicine may result in emergence of the resistant strains of the virus. It is therefore strongly advised to restrain from the irrational use of medication when using it for the chemoprophylaxis. The use of Oseltamivir for specific high-risk groups is described in the tables 1&2 as given below:

Table 1: Recommended Dosage and Duration of Influenza Antiviral Medications for Treatment or Chemoprophylaxis (adopted from CDC)

Anti-viral Agent	Use	Children	Adults
Oseltamivir	Treatment (5 days)	<p>If younger than 1 yr old 3 mg/kg/dose twice daily</p> <p>If 1 yr or older, dose varies by child's weight:15 kg or less, the dose is 30 mg twice a day >15 to 23 kg, the dose is 45 mg twice a day >23 to 40 kg, the dose is 60 mg twice a day >40 kg, the dose is 75 mg twice a day</p>	75 mg twice daily
	Chemo-prophylaxis (7 days)	<p>If child is younger than 3 months old, use of oseltamivir for chemoprophylaxis is not recommended unless situation is judged critical due to limited data in this age group. If child is 3 months or older and younger than 1 yr old 3 mg/kg/dose once daily If 1 yr or older, dose varies by child's weight:15 kg or less, the dose is 30 mg once a day >15 to 23 kg, the dose is 45 mg once a day >23 to 40 kg, the dose is 60 mg once a day >40 kg, the dose is 75 mg once a day</p>	

Table 2: Chemoprophylaxis for the high-risk groups of Influenza A

Level of risk	Risk groups	Chemoprophylaxis*
High risk	Sharing household with or caring for a Patient. People older than 65 years Unprotected close contact (<1 meter) with patient.	Oseltamivir** in dose of 75 mg/day to continue for 7-10 days after last exposure.
Moderate risk	Persons handling sick animals or decontaminating environment without PPE. Direct exposure to sick/dead animals Infected with H5N1.	May be provided the same chemoprophylaxis as with high-risk group.
	Health-care worker in direct contact with patient without complete PPE. Laboratory personnel who might have an unprotected exposure.	As above
Low Risk	<i>Health-care worker with PPE or contact >1 meter with a patient.</i> <i>Cullers of non-infected animals.</i> <i>Persons with PPE handling sick/dead birds or contaminated environment.</i>	<i>Probably no Chemoprophylaxis needed.</i>

* Prophylactic Oseltamivir has to be given as a supervised medication

** Adverse Effects: Nausea and vomiting (10%&9%), less if taken with food

For persons going to handle sick or dead birds or work in a contaminated environment with improper Personal Protective Equipment (PPE) and health workers working in close contact with confirmed pandemic influenza patient, chemoprophylaxis should be provided.

3.2.4. Public Health Measures

General cleanliness, hygiene, practice of regular hand washing, performing ablution five times a day for Muslims, and respiratory hygiene would be emphasized as part of general preparedness for either seasonal influenza or a new, novel pandemic strain. This should also be reinforced in schools, places of general gathering, bus stops, train stations, air ports, public markets and malls. The public and the community would be sensitized at all levels by BHU and district health officials on public health measures as on-going activity so that people are frequently reminded on the prevention and control measures. One of the important objectives during the pandemic phases 1-3 is to prevent human influenza infection from animals by reducing infection risk in those involved in

handling animals and its products and in responding to animal disease outbreaks. Continued education and training regarding the potential risk of transmission and correct use of Personal Protective Equipment is essential. Measures to reduce human contact like use of gloves and mask while handling potentially infected animals should be emphasized as part of public health education program. Employers of the poultry breeding must abide by the ISO 14000 standards, and to the prevention measures as per Influenza/pandemic guidelines and instructions.

Mass gathering can leads to escalation of the pandemic and its consequences. Public mass gatherings like celebration, entertainment programs (theatre movie, reality shows, games and sports) would be deferred or cancelled during a influenza pandemic. Standard Operating Procedures (SOPs) would be developed to suspend school, college and university classes in the event of severe pandemic, which would guide the academic/education authority (Ministry of Education/Higher Education Commission) and health officials in school/academic institutions' closures. Promoting reduction of unnecessary travel within and out of the country and overcrowding of mass transport systems would be also considered as this will help in delaying the spread of influenza infection. Therefore, framework to facilitate decision-making for cancellation or restriction of mass gatherings at the time of pandemic would be developed.

Similarly, with in a household, guideline on infection control in a home setting would be developed. This will serve the guide to individual to safeguard against person to person transmission in a close contact. Supplementing this, development of guidelines on home-based management and guideline to provide necessary support for ill persons, isolated at home, and their household contacts should be beneficial. Mild cases, during a large scale pandemic, may be managed and medically house arrested at home with proper home based management procedure. Moderately severe cases can also be dealt with but with extreme caution and with basic necessary support like food and other logistics to the household. This logistic support would be in close coordination with the PDMAs/DDMAs.

3.2.4.1. Advocacy, communication and awareness

The communication in pandemics and disasters is of utmost importance. Right information, at right tie and at right place. Communication is required in preparedness phase, during response and/or disaster phase, and during the post-pandemic time. In this regard, a national pandemic communication plan detailing the communication strategies and the SoPs would be developed for effective communication about risk related to influenza pandemics.

The communication plan should include, but not limited to, the following:

- Standard Operating Procedure for dissemination of communication materials
- Development of effective communication strategies and messages to inform, educate, and communicate with individuals and families
- Establishment of communication teams

- Advocacy, Communication and Social Mobilization activities and awareness plans for high level officials and leaders regarding global and national pandemic influenza risk
- Conducting the ACSM campaigns in close collaboration with the relevant stakeholders on individual, and household level infection control measures
- Improve community awareness of Public Health measures for community level control of pandemic

3.3. Response phase: Scenario-bases pandemic response

There are four pillars of pandemic preparedness: a) preparedness and communication b) Surveillance and detection, c) command and response d) commitment and motivation. A pandemic preparedness plan has three main goals: a) to limit spread and damage b) to protect commerce and infrastructure c) to assure governmental and economic continuity.

For response, there can be three possible scenarios described below whenever the new, novel virus is imported in Pakistan. The response will trigger to the scale defined by the scenario:

3.3.1. Scenario 1: Low overall population attack rate.

SS.

Table 3: Scenario 1, low transmissibility of infection

Population Attack Rate	Number of Infected/ill	Percentage who are Serious Ill	Percentage of cases who are seriously ill
1%	7000	1%	70
		10%	700
		20%	1400

If we assume 10% mortality rate among seriously ill persons, then the expected number of deaths would range from 7 to 140.

As this scenario assumes a very low attack rate of 1% (i.e., low transmissibility), It would not put an extraordinary burden of sickness for the population or the health system, even when the virulence of the virus might be high (20%), generating 1400 seriously ill persons.

The fundamental objective of the scenario should be basic response consisting of surveillance and detection, comprehensive assessment, and very close monitoring with continuously building situation.

3.3.1.1. Planning and coordination

Documentation of the information on global pandemic evolution including geographical spread, trends, and impact from the reliable sources like WHO and CDC websites would be done.

At this stage, strict rapid pandemic containment activities would be initiated and coordinated instantly as per the rapid containment protocol in collaboration with WHO to limit the spread of human infection. To do so, National Steering Committee and national incident command mechanism would be activated for proper control and coordination of rapid containment operations as described below.

3.3.1.1.1. Incident Command Structure and Function for Mo NHR&C and D/o Health

An explicit command and control mechanism will be established at the national level with its links to operational levels, and with the Rapid Response Teams (RRTS). This arrangement is highly conducive for coordination among all the key stakeholders during pandemic emergencies and also will facilitate regular, timely and smooth information flow from and to the incident site. The ICS closely works with the NDMA facilitating coordination of the response activities to be carried out in the incident zone (s).

The ICS arrangement is depicted as per figure 4 below. It clearly outlines the chain of command and flow of information indicated by respective arrows for different tiers/hierarchical stages of the ICS.

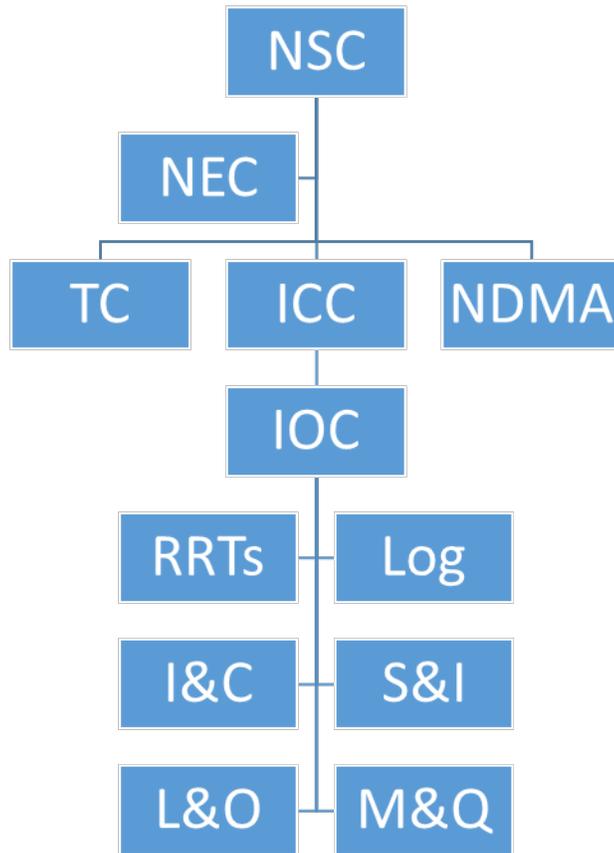


Figure 4: The national incident command structure for influenza pandemic response.

3.3.1.1.2. The National Incident Command Centre (NICC)

The NICC is the main technical arm activated in case of a pandemic response. It will consist of all the major stakeholders and institutions involved in operation. The trigger for the activation of this center would be when the Disease Outbreak Investigation Team recommends to the M/o NHR&C of a case meeting the case definition of pandemic Influenza, and after convening an emergency meeting with the relevant experts.

The NICC team constitutes following members:

- Secretary, Ministry of Health – Chairman/Head,
- Director General NHEPRN, (Member/Secretary)
- Chief Epidemic Investigation Cell , NIH
- Director, Department of Livestock, MINFAL
- Director, NDMA
- Director, Crises Management Cell
- Executive Director of a major hospital

- Technical Focal Person for influenza pandemic, M/o NHR&C
- Program Officer, IHR, Ministry of NHR&C

The NICC meeting shall be convened within 12 hours of receiving a report from the routine investigation team.

Roles and Responsibilities:

- Declare an outbreak of avian influenza or other influenza pandemic in the country and issue official notification for implementation of rapid containment strategy in consultation with the national technical experts and WHO;
- Authorize issuance of notice to the WHO;
- Activate Incident Operation Centre (IOC) and rapid response teams;
- Provide policy direction for response activities;
- Issue executive orders for enforcement of response activities;
- Facilitate and mobilize fund and logistics required for the Rapid Response Teams;
- Ensure that appropriate risk communication activities are conducted
- Maintain liaison with other relevant national and international organization;
- Provide updates to National Steering Committee (NSC) and to the department of disaster management.

b. 3.3.1.1.3. Incident Operation Centre (IOC)

The Incident Operation Centre is the field level coordination and implementation unit for rapid response and control measures. The IOC will be identified and designated by the district at the incident area and the unit will be responsible for providing field level information and updates on the disease status, progress and control activities to the NICC. The members of the IOC will consist of the team leaders of different teams under national, regional and district Rapid Response Teams (RRT). They will ensure basic infrastructure and essential services to the RRT members.

TT. Members of the Incident Operation Centre

S/N	Task/Roles	Members	Agency
-----	------------	---------	--------

S/N	Task/Roles	Members	Agency
1	Incident Commander/Team Leader <ul style="list-style-type: none"> • Presents available information • Outlines investigation plans • Assigns roles and responsibilities • Oversees team member roles 	Medical Superintendent DHQ/THQ, EDO/DHO, concerned district	Concerned first referral hospital, concerned district

	<ul style="list-style-type: none"> • Reports to NICC 		
2	Epidemiological Surveillance <ul style="list-style-type: none"> • Verifies the outbreak • Establishes a case definition • Conducts case finding and identifies risk factors • Identify and coordinate control measures • Supervises data collection and data analyses 	Medical Epidemiologist, Medical officer (trained)	Provincial Health Department/ concerned district
3	Lab surveillance and diagnosis <ul style="list-style-type: none"> • Advise and assure proper specimen collection, transportation, and storage • Verify proper laboratory diagnosis to help refine a case definition 	Focal person, Influenza Surveillance, Head, Laboratory service, District hospital	Concerned national lab and the NIH at the Federal level, Concerned concerned district hospital

4	<p>Risk communication to public (at the site)</p> <ul style="list-style-type: none"> Establish and maintain contact with local & national media on dissemination of appropriate messages House to house advocacy on prevention and control measures at incident area 	DHO, Communication Officer,	Health Department, concerned District
5	<p>Case management, isolation and quarantine</p> <ul style="list-style-type: none"> Advises and assists in managing patients Educates, implements, and supervises infection control measures 	Medical Specialist/Officer (trained) /Medical Specialist/Officer (trained)	Tertiary Care Hospital of the concerned District. Province
	<ul style="list-style-type: none"> Knows hospital bed capacity and medical capability 		
6	<p>District and local level logistics support (DCO/PDMA/DDMA)</p> <ul style="list-style-type: none"> Manage logistic supplies (PPE, antiviral, food, water) Coordinate with RBP in law enforcement Monitor finances Arrange transportation 	DDMA/ District Administration/District level Hospital	Concerned district administration and hospital
7	<ul style="list-style-type: none"> Ensure law and order 	Local CPO/SSP/SP	Concerned District Administration

It is imperative that the incident commander should be field/district who has good technical knowledge of the disease (have relevant Public Health/epidemiology and emergency preparedness: HOPE graduate) and he would be the overall coordinator of the IOC and its functions. He would also be the spokesperson during the pandemic. Functions of the Incident Operation Centre are:

- Activation of Incident Operation Centre as per the directives from NICC;
- Conduct meeting and debriefing of the team at the end of each day;
- Provide Logistic support to the RRT
- Coordinate and monitor the activities of various teams under RRT;
- Provide daily updates to the NICC

Mode of operation

Upon receiving executive order from the NICC, the IOC will be activated within 6 hours. The IOC will convene meeting daily and provide updated information to NICC. The Chairman of the District Disaster Management Committee (DDMC) will facilitate in providing logistical support to the RRTs during the operation.

3.3.1.1.4. Rapid Response Teams

During the incident of influenza pandemic outbreak, there will be ideally five sub team of Rapid Response Teams as shown in figure no. 5. They are Disease Investigation and Surveillance Team, Medical and Quarantine Team, Logistic Team, Information and Communication Team, and Law and Order Team consisting relevant members from national, regional and district levels (including BHUs). All these RRT members would be trained yearly on their roles and responsibilities as per the SoPs and guidelines.

Roles and responsibilities of RRT:

1. **Overall Rapid Response Team:** This will be the eyes and ears of the other RRTs. They will be the first responders and will move with the PUSH and basic logistics and coordinate with the other RRTs.
2. **Disease Investigation and Surveillance Team:** will carry out disease investigation and surveillance. The team is responsible to initiate local investigation and start standard control measures to prevent further transmission. The team shall also be involved in carrying out surveillance activities and laboratory diagnostic services as per the SoPs and guidelines annexed herewith.
3. **Logistic team:** shall ensure basic infrastructure and essential supplies (All logistic supports) for the RRT members.
4. **Medical and Quarantine Team:** shall be responsible for antiviral prophylaxis, diagnosis and management of influenza cases. For detailed ToR refer SOP for case management and SOP for specimen collection, testing, storage and transport. The team will also ensure quarantining of the contacts, monitoring the person quarantined and ensuring that they comply with the rules. (As per the SOP)

5. **Information and Communication Team:** shall carry out risk communication to the public informing about the health risks and the measures being taken by the authorities. The team will also inform the public about Do's and Don'ts' to protect them during the emergency.
6. **Law and Order Team** shall ensure the compliance and smooth implementation of the disease control and containment measures.

As per the Standard Operating Procedures, all of these RRTs would be deployed to the incident area immediately urgently initiate the rapid containment operation. In addition, plans and procedures to access and mobilize additional human and material resources would also be activated. Simultaneously, regular update on evolving situation would be provided to the WHO through IHR at the NIH, Islamabad, in close coordination with the NHEPRN, to facilitate coordination of response activities. Depending upon the scale of the evolving situation, additional antiviral drugs and technical human resource could be requested from the WHO. .

3.3.1.2. Surveillance and Monitoring

Surveillance of any unusual cases need continuous vigilance and notification of any Influenza Like Illness (ILI) at all levels. The health care facilities will be notified to be extremely alert on ILI and ARI cases visiting the BHUs/RHCs/THQs/DHQs and Teaching Hospitals. The health facilities would be required to record and analyze the ILI/ARI cases on every-day-basis. The hospitals must notify their respective head, the Incident Command and the EIC and NHEPRN at the Federal level. Any unusual increase in number of cases must be taken seriously and thoroughly investigated. The investigation and surveillance team will initiate active surveillance by making house to house visit at the incident area to find out any suspect cases as per the SoP for disease outbreak investigation and surveillance.

The provincial/area public laboratory, as mentioned elsewhere in the text, and the NIH should ensure to acquire the necessary reagents as soon as possible to identify the new, novel virus. A comprehensive assessment of the earliest cases of the new, novel virus, including documenting epidemiological changes and clinical characteristics for possible revision of the national case definition would be undertaken.

3.3.1.2.1. Rapid Containment

Rapid containment operation will be initiated during the influenza pandemic outbreak as per the Rapid Containment Protocol in close consultation with the WHO. Both the pharmaceutical and non-pharmaceutical interventions (as described above in the document) will be implemented in letter and spirit in potentially large populations exposed to the virus in order to stop further progression in the pandemic.

UU. The Containment procedures

According to the SoPs of surveillance of an outbreak, the Index case (or the Index Cluster) would be identified As Soon As Possible (ASAP) and geographically defined

containment zone would be created around the case(s), using the GPS enabled devices where feasible, followed by the widespread pharmaceutical and non-pharmaceutical interventions.

As defined in WHO's protocols, the Containment Zone should be the largest possible area that could be created and feasibly maintained and must be large enough to surround all known persons infected by pandemic influenza and as many of the people in frequent contact with them. While a circular Containment Zone is conceptually the simplest, the actual size and shape of the Containment Zone and the Buffer Zone is expected to be influenced by pragmatic considerations such as:

- known movements and geographical distribution of cases and contacts;
- Important local or national administrative boundaries as well as important natural boundaries that may limit the movement of people;
- infrastructure and essential services (e.g. power, water, sanitation, food supply, communications) considerations that may substantially affect the safety and health of people within the Containment or Buffer Zones

A Buffer Zone will be defined surrounding the Containment Zone. The Buffer Zone is an area where active and complete surveillance would be initiated to detect any possible cases of pandemic influenza.

Follow-up of persons who have moved outside the Containment Zone: All possible measures should be taken to follow up persons who have left the containment zone before or after the start of the operation and who possibly could have come in contact with a person infected with AI (H5N1).

Once the Containment Zone and Buffer Zone have been identified rapid containment activities would be initiated as per the RC protocol. These protocols should be judiciously followed in any influenza like illness, and other pandemics.

3.3.1.3. Health Care Capacity Response

As soon as the pandemic is declared, all the hospitals would activate and implement all hazard Hospital emergency preparedness plan (HEPP), and start providing medical care and support to the patients as per the clinical case management guidelines. The hospitals would initiate triage, isolation and identify cohort of probable cases in the hospital, and secondary sites as per their plans. Additional human resource will be mobilized from other health facilities within the affected district, and from non-affected districts, as per the roster prepared. The hospital surge capacity will be addressed as per the HEPP.

The district management team members and non-governmental agency volunteers (trained in dealing with pandemic situations) would provide nonmedical support for patient contacts in households and secondary sites, if needed. Good hand hygiene, isolation of ill persons, and the use of PPEs are important measures when caring for persons with influenza to decrease viral transmission. The guideline for home based and community based interventions during influenza

pandemic would be used in the community. Any persons with severe illness would be provided with Tamiflu medication as early as possible following the onset of symptoms without waiting for laboratory results. The training of the district management team and the volunteers pool on the personal hygiene, use of PPEs and communicating the value of the personal hygiene at the household and community level would be given to them.

3.3.1.4. Public Health Measures

At the individual contact level, the household contacts will be advised to minimize their level of interaction outside the house, and to isolate themselves at the first trigger of any symptoms of influenza. They must adopt the individual infection control measures like mouth guarding while coughing, hand and respiratory hygiene, use of face mask, and disposal of sputum as per the guideline for home-based and community-based interventions during the pandemic. The importance of not only protecting themselves but also their close family members will be made important to them.

Further to reduce risk of people getting infected and transmitting the disease to healthy individuals, social distancing measures like closure of schools, cancellation of mass gatherings and public events (such as market closure), closing workplaces or having non-essential workers to stay at home, and minimizing mass transit should be implemented through the executive order from National Steering Committee.

ACSM activities in both affected and non-affected districts would be intensified and extensively carried out on advising people with acute respiratory illness to stay at home and to minimize their contact with household members and others. This would be done at all levels using both national and local media as per the communication plan. All this would be carried out without creating a sense of fear and havoc among the general population.

According to the Rapid Containment Protocol, both pharmaceutical and non-pharmaceutical interventions will be implemented. All persons in the containment zone who are either sick or not ill would be given anti-viral prophylaxis for 20 days and person presenting with ILI will be treated with antiviral treatment for 5 days as per the clinical management guideline. All sick persons will be isolated and persons who had close contact with the confirmed case would be quarantined in a designated place to prevent infection to healthy individuals. Active surveillance of the probable cases would continue with notifications and containments, and further measures.

3.3.2. Scenario 2: Moderate overall population attack rate. Table 2 illustrates possible outcomes of this scenario.

Table 2.

Pop. Attack Rate	Number of Infections	Percent of Seriously ill	Number cases of serious illness
-------------------------	-----------------------------	---------------------------------	--

Pop. Attack Rate	Number of Infections	Percent of Seriously ill	Number cases of serious illness
10%	67,000	1%	670
		10%	6,700
		20%	13,400

Assuming a 10% mortality rate among seriously ill persons, the expected number of deaths would range from 670 to 1,340. This scenario does not pose an extraordinary level of mortality. With low virulence, there might be considerable transmission of the virus, but the number of seriously ill persons would not pose an excess burden on the health care system. However, with considerable transmission and the highest level of virulence, the potential number of seriously ill persons would stress the current health care system. The objective of the response is to minimize transmission as much as possible to reduce the burden on the health care system and to provide health care for seriously ill patients. Most of the recommendations for scenario #1 would be applicable in this case.

3.3.2.1. Response action for low virulence:

- Same as for scenario #1.

3.3.2.2. Response action for high virulence:

3.3.2.2.1. General Measures – Aggressive containment and control measures would be applied through IOC and rapid response teams to minimize transmission as much as possible to reduce the burden on the health care system and to provide health care for seriously ill patients. Documentation of the evolving pandemic including geographical spread, trends, and impact would be continued.

3.3.2.2.2. Surveillance and Monitoring

Surveillance of any unusual cases need continuous vigilance and notification of any Influenza Like Illness (ILI) at all levels. The health care facilities will be notified to be extremely alert on ILI and ARI cases visiting the BHUs/RHCs/THQs/DHQs and Teaching Hospitals. The health facilities would be required to record and analyze the ILI/ARI cases on every-day-basis. The hospitals must notify their respective head, the Incident Command and the EIC and NHEPRN at the Federal level. Any unusual increase in number of cases must be taken seriously and thoroughly investigated. The investigation and surveillance team will initiate active surveillance by making house to house visit at the incident area to find out any suspect cases as per the SoP for disease outbreak investigation and surveillance.

The provincial/area public laboratory, as mentioned elsewhere in the text, and the NIH should ensure to acquire the necessary reagents as soon as possible to identify the new,

novel virus. A comprehensive assessment of the earliest cases of the new, novel virus, including documenting epidemiological changes and clinical characteristics for possible revision of the national case definition would be undertaken.

3.3.2.2.3. Health Care Capacity Response

As described above, the hospitals will follow their Emergency Preparedness and Response Protocols. Where necessary, hospitals would institute triage and set up secondary health care sites when hospital capacity is exceeded as per the hospital contingency plan and district pandemic plan. At this stage it would be essential to ensure awareness of influenza case definitions among health care providers at all levels. All the hospitals should ensure that the PPE is available at hospitals and secondary health care sites. The hospitals shall:

- Mobilize potential sources for obtaining needed supplies and equipment, e.g., antibiotics, antipyretics, hydration, oxygen, and ventilation support.
 - Mobilize retired or inactive health care workers from roster.
 - Mobilize trained local volunteer or non-governmental organizations that could provide assistance, e.g. supporting secondary health care sites and home health care.
 - Discharge all but severely ill patients to create beds for patients who are acutely ill with SARI due to the pandemic strain.
 - Provide medical and non-medical support for patients and their contacts in households, if needed. Good hand hygiene, isolation of ill persons, and the use of personal protective equipment are important measures when caring for persons with influenza to decrease viral transmission.
 - Provide Tamiflu medication for any persons with severe illness as early as possible following the onset of symptoms without waiting for laboratory results.
- Follow strict infection control measures in the health facilities as per national guidelines.

3.3.2.1.4. Public Health Measures

With a highly virulent virus, the objective would be to minimize transmission as much as possible to reduce the burden on the health care system. At this stage it would be very important to start implementing social distancing measures as per the guideline on social distancing. Closure of schools would be considered as per the criteria and guideline on reducing transmission of pandemic influenza virus in schools.

Following preventive measures would be aggressively emphasized through various means of media and also through house to house visit:

- Advise people with acute respiratory illness to stay at home and to minimize their contact with household members and others.
- Advise household contacts to minimize their level of interaction outside the home and to isolate themselves at the first sign of any symptoms of influenza.
- Promote hand and respiratory hygiene.
- If possible, identify a separate room in the house for care of sick family members. Consider designating a single person as the main caregiver for anyone who gets sick.
- Encourage reduction in travel and crowding of the mass transport system.

3.3.3. Scenario 3: High overall population attack rate. Table 3 illustrates possible outcomes of this scenario.

Table 3.

Pop. Attack Rate	Number of Infections	Percent of seriously ill	Number of cases of serious illness
20%	134,000	1%	1,340
		10%	13,400
		20%	26,800

Assuming a 10% mortality rate among seriously ill persons, the expected number of deaths would range from 134 to 2,680. In this scenario, even a moderately virulent virus would create serious stress in the health care system. A highly virulent virus, such as H5N1, would create a serious crisis. With a relatively high attack rate, all measures to reduce transmission and care for seriously ill patients would be employed. As in scenario #2, the objective of the response is to minimize transmission as much as possible to reduce the burden on the health care system and to provide health care for seriously ill patients. Most of the response action for scenarios #1 and #2 would be applied in this case.

3.3.3.1. Response action for very high virulence virus:

3.3.3.1.1. General Measures – Extremely aggressive measures are required to minimize transmission to maximize possible reduction in burden on the health care system, and to provide health care for seriously ill. Other response measures will be similar to the scenario #2

3.3.3.1.2. Surveillance and Monitoring

- Continue ILI surveillance.
- Monitor ARDS surveillance in all district hospitals.
- Ensure that the reference laboratory acquires the necessary reagents as soon as possible to identify the new, novel virus, especially in patients with ARDS.
- Mobilize the regional RRT to investigate unusual clusters of influenza-like respiratory illness or deaths.

3.3.3.1.3. Health Care Capacity Response –

- Full mobilization of the health care sector will be required, including opening secondary health care sites when hospital capacity is exceeded.
- Ensure awareness of influenza case definitions among health care providers.
- Ensure PPE is available at hospitals and secondary health care sites.
- Mobilize potential sources for obtaining needed supplies and equipment, e.g., antibiotics, antipyretics, hydration, oxygen, and ventilation support.
- Mobilize retired or inactive health care workers from roster.
- Mobilize trained local volunteer or non-governmental organizations that could provide assistance, e.g. supporting secondary health care sites and home health care.
- Discharge all but severely ill patients to create beds for patients who are acutely ill with ARDS due to the pandemic strain.
- Provide medical and non-medical support for patients and their contacts in households, if needed. Good hand hygiene, isolation of ill persons, and the use of personal protective equipment are important measures when caring for persons with influenza to decrease viral transmission.
- Provide Tamiflu medication for any persons with severe illness as early as possible following the onset of symptoms without waiting for laboratory results.
- Identify all contacts of ill persons and consider liberal use of Tamiflu for prophylaxis in all health care workers and contacts.
- Follow strict infection control measures in the health facilities.

3.3.3.1.4. Public Health Measures – With a highly virulent virus, the objective should be to minimize transmission as much as possible to reduce the burden on the health care system.

- Implement social distancing measures (see Annex 4).

- Preemptive school closure should be considered as per criteria suggested in Annex 3.
- Advise people with acute respiratory illness to stay at home and to minimize their contact with household members and others.
- Advise household contacts to minimize their level of interaction outside the home and to isolate themselves at the first sign of any symptoms of influenza.
- Promote hand and respiratory hygiene aggressively.
- If possible, identify a separate room in the house for care of sick family members.

Consider designating a single person as the main caregiver for anyone who gets sick.

- Encourage reduction in travel and crowding of the mass transport system.
- Consider cancellation or postponement of mass gatherings.

XIV. REFERENCES

1. Patriarca, P.A. and N.J. Cox, *Influenza pandemic preparedness plan for the United States*. Journal of Infectious Diseases, 1997. **176**(Supplement 1): p. S4-S7.
2. Organization, W.H., *WHO global influenza preparedness plan: the role of WHO and recommendations for national measures before and during pandemics*. 2005.
3. Jennings, L.C., et al., *Stockpiling pre-pandemic influenza vaccines: a new cornerstone of pandemic preparedness plans*. The Lancet infectious diseases, 2008. **8**(10): p. 650-658.
4. Organization, W.H., *WHO global influenza preparedness plan*. 2005.
5. Cox, N.J., S.E. Tambylyn, and T. Tam, *Influenza pandemic planning*. Vaccine, 2003. **21**(16): p. 1801-1803.
6. Hehme, N., et al., *Pandemic preparedness: lessons learnt from H2N2 and H9N2 candidate vaccines*. Medical microbiology and immunology, 2002. **191**(3-4): p. 203-208.
7. Osterholm, M.T., *Preparing for the next pandemic*. New England Journal of Medicine, 2005. **352**(18): p. 1839-1842.
8. Donaldson, L.J., et al., *Mortality from pandemic A/H1N1 2009 influenza in England: public health surveillance study*. Bmj, 2009. **339**.
9. Murray, C.J., et al., *Estimation of potential global pandemic influenza mortality on the basis of vital registry data from the 1918–20 pandemic: a quantitative analysis*. Lancet, 2006. **368**: p. 2211-18.
10. Naeem, K., et al., *Avian influenza in Pakistan: outbreaks of low-and high-pathogenicity avian influenza in Pakistan during 2003–2006*. Avian diseases, 2007. **51**(s1): p. 189-193.
11. Escorcia, M., et al., *Improving global influenza surveillance: trends of A(H5N1) virus in Africa and Asia*. BMC Res Notes, 2012. **5**(62): p. 1756-0500.
12. Kouadio, I.K., et al., *Infectious diseases following natural disasters: prevention and control measures*. 2012.
13. Amin, S. and M.P. Goldstein, *Data against natural disasters: establishing effective systems for relief, recovery, and reconstruction*. 2008: World Bank Publications.
14. Alexander, D., *The study of natural disasters, 1977–97: some reflections on a changing field of knowledge*. Disasters, 1997. **21**(4): p. 284-304.
15. Peek, L., *Children and disasters: Understanding vulnerability, developing capacities, and promoting resilience—an introduction*. Children Youth and Environments, 2008. **18**(1): p. 1-29.
16. Toole, M.J. and R.J. Waldman, *THE PUBLIC HEALTH ASPECTS OF COMPLEX EMERGENCIES AND REFUGEE SITUATIONS 1*. Annual review of public health, 1997. **18**(1): p. 283-312.
17. Brennan, R.J. and R.J. Waldman, *The south Asian earthquake six months later—an ongoing crisis*. New England Journal of Medicine, 2006. **354**(17): p. 1769-1771.
18. McCann, D.G. and H.P. Cordi, *Developing International standards for disaster preparedness and response: How do we get there?* World Medical & Health Policy, 2011. **3**(1): p. 1-4.
19. Padma, T., *Developing solutions*. Nature, 2010. **466**(7304): p. S16-S17.
20. Franco-Paredes, C., P. Carrasco, and J.I. Preciado, *The first influenza pandemic in the new millennium: lessons learned hitherto for current control efforts and overall*

pandemic preparedness. Journal of immune based therapies and vaccines, 2009. **7**(1): p. 2.

21. Organization, W.H., *Comparative analysis of national pandemic influenza preparedness plans*. 2011. p. 64.

Annex-1

		Scores			
		0	1	2	3
Indicators for Planning and Coordination					
National Level					
1.	Is the national pandemic influenza preparedness plan part of the national disaster preparedness plan?	X			
2.	Is there a national influenza pandemic preparedness planning committee/ task force?	X			
3.	Does the plan specify members of the national pandemic planning committee/task force?	X			
4.	Does the plan specify how often the national committee/task force meets?	X			
5.	Does the plan identify and specify the roles and responsibilities of the national committee/ task force?	X			
6.	Does the plan specify the roles and responsibilities of other agencies		X		
7.	Does the plan have information on the management and decision making process (command and control structure) during pandemic	X			
8.	Does the plan outline communication and coordination structure for agencies involved in pandemic preparedness and response actions?	X			
9.	Does the plan include international co-operation for pandemic preparedness and response actions?		X		
10.	Have considerations been given for maintenance of	X			

		Scores			
		0	1	2	3
	essential services during pandemic (such as food and water supply, etc.)?				
Indicators for Planning and Coordination					
National Level					
11.	Are there timelines for completion of the various stages of the plan	X			
12.	Are there monitoring and evaluation strategies such as indicators, targets for the implementation of the plan	X			
13.	Is there an agency/a committee responsible for monitoring & evaluating the implementation of the plan?	X			
14.	Is there a legislation or legal framework for the implementation of the national plan?	X			
15.	Does the plan estimate/assess the potential impact of the pandemic (risk assessment) Such as morbidity, mortality, impact on health	X			
16.	Does the plan specify timeline for reviewing the national plan – How often?	X			
17.	Is there a plan to carry out pandemic exercise (simulation or desk-top) to test the national plan? When	X			
18.	Are pandemic planning and response measures organized by the WHO pandemic phases?	X			
19.	Does the plan identify country specific triggers that change the level of response?	X			
20.	Are financial resources (funding, budget etc.) outlined in the plan?				X
Indicators for Planning and Coordination					

		Scores			
		0	1	2	3
Sub-national Level					
21.	Is there a sub-national (province/district/state) pandemic influenza preparedness and response plan?	X			
Indicators for Planning and Coordination					
Sub-national Level					
22.	Is there a sub-national influenza pandemic preparedness planning committee/task force at (at the province/district/states level)?	X			
Indicators for Situation Monitoring and Assessment					
23.	Does the plan have communication mechanisms for the rapid and timely exchange of human surveillance information (national and international)?		X		
24.	Does the plan mention the implementation of IHR for pandemic response?	X			
25.	Is influenza part of the national infectious disease surveillance and response (IDSR) system?	X			
26.	Are surveillance activities organized by the WHO phases or periods?	X			
Inter-pandemic surveillance					
27.	Does the country have influenza surveillance system in place such as seasonal, ILI, SARI etc?		X		
28.	Are influenza surveillance sites mentioned in the plan such as sentinel sites, hospital, health centers?		X		
29.	Does the plan outline participation in the Global Influenza Surveillance Network?	X			
30.	Does the plan specify surveillance systems that detect unusual occurrence of influenza or unusual/unexplained event of respiratory illness that require appropriate investigation (early	X			

		Scores			
		0	1	2	3
	warning)?				
Enhanced Surveillance					
31.	Does the plan specify enhanced surveillance for potential or new strains of pandemic influenza virus?	X			
Pandemic Surveillance					
32.	Does the plan specify surveillance measures during a pandemic	X			
Animal Surveillance					
33.	Does the plan include influenza surveillance in susceptible animals (poultry, wild birds, pigs)?		X		
34.	Does the plan specify communication strategy (sharing surveillance information, meeting etc) between human and animal surveillance?		X		
Indicators for Prevention and Containment					
Individual/household measures					
35.	Does the plan specify individual/household infection control measures to reduce the risks of influenza transmission		X		
Community Infection Control Measures					
36.	Does the plan specify community infection control measures to limit animal-human transmission? (from WHO 2005 checklist)				X
Social Distancing					
37.	Does the plan specify a protocol & implementation plan for closure of educational institutions or day care facilities?	X			
38.	Does the plan specify how other social distancing measures such as prohibition of mass gatherings	X			

		Scores			
		0	1	2	3
	etc. will be implemented?				
<i>Travel and Trade</i>					
39.	Does the plan specify travel related information (restrictions, advisory) to and from affected areas?	X			
40.	Does the plan specify trade related information (such as restrictions) to and from affected areas? (from checklist 2005)	X			
<i>Isolation and Quarantine</i>					
41.	Is there information regarding isolation/confinement of cases?			X	
42.	Is there information regarding quarantine of contacts or others?			X	
<i>Antiviral Drugs</i>					
43.	Is there information regarding the use of antiviral drugs during pandemic (prophylaxis and/or treatment)?			X	
44.	Does the plan specify the use of antiviral for treatment?			X	
45.	Does the plan specify priority groups for antiviral prophylaxis?	X			
46.	Does the plan specify information on antiviral drugs supply/procurement strategy such as estimated amount, % of population, stockpiling?		X		
47.	Does the plan specify sources antiviral drugs?	X			
48.	Does the plan have information /guidelines for antiviral drugs storage?	X			
49.	Does the plan have information/ guidelines for antiviral drugs distribution?	X			
50.	Does the plan specify monitoring strategy for	X			

		Scores			
		0	1	2	3
	antiviral drugs (such as monitoring usage, efficacy, adverse events or resistance)?				
Vaccines					
51.	Does the plan specify vaccination use/policy for pandemic influenza?		X		
52.	Does the plan specify priority groups for pandemic influenza vaccination?			X	
53.	Does the plan mentioned mass vaccination for pandemic influenza	X			
54.	Does the plan specify strategies for pandemic vaccine supply/ procurement (such as estimated amount, % of population, contract/ arrangement with manufacturers etc.)?	X			
55.	Does the plan specify the sources of pandemic vaccine?	X			
Indicators for Prevention and Containment					
56.	Does the plan have information/guidelines for pandemic vaccine storage?	X			
57.	Does the plan have information/guidelines for pandemic vaccine distribution?	X			
58.	Does the plan specify monitoring strategy for pandemic vaccine (such as monitoring coverage, efficacy, or adverse events)?	X			
Other Pharmaceuticals and Supplies					
59.	Does the plan specify other medications (antibiotics, antipyretics, etc.) procurement and logistics?	X			
60.	Does the plan specify medical supplies for infection prevention and control procurement and logistics?	X			
Indicators for Health System Response					

		Scores			
		0	1	2	3
Laboratory Capacity					
61.	Does the country have laboratory/ies for routine influenza testing?				X
62.	Does the plan specify any laboratory where samples should be sent for virus isolation and/or sub typing or a WHO reference laboratory for confirmation or determination of influenza virus (in or outside the country)?		X		
63.	Does the plan have guidelines for human specimen collection, handling, transport and disposal?	X			
64.	Does the plan specify guidelines for standard laboratory procedures?	X			
65.	Is there a strategy to share clinical material (from confirmed cases) and laboratory results with national agencies and/or International (WHO, neighboring countries, other countries etc)?		X		
66.	Does the plan specify monitoring strategy for antiviral drug resistance?	X			
Epidemiological Investigation and Contact Management					
67.	Is there information on epidemiological investigation of confirmed cases of influenza caused by new strain (to assess modes of transmission, disease presentation etc.)?	X			
68.	Does the plan have mechanisms for rapid and timely (daily) exchange of outcomes of epidemiological investigations with national and international agencies (WHO)?			X	
Case Management and Treatment					
69.	Is there a country specific clinical guideline (which includes diagnosis, treatment, admission and discharge criteria etc.) for the management of pandemic influenza?		X		

		Scores			
		0	1	2	3
70.	Does the plan identify health facilities where patients access treatment during pandemic?	X			
71.	Does the plan identify potential alternative sites for medical care during pandemic and specify the level of care?	X			
72.	Does the plan identify health facilities priorities and response strategies during pandemic such as triage, case referral, service prioritization etc.		X		
73.	Does the plan specify training needs for health workers (surveillance, laboratory, infection control, case management, antivirals, vaccines etc.)?		X		
<i>Infection Control in Health care Settings</i>					
74.	Is there information on infection prevention and control at all level of health care facilities?		X		
<i>Health Personnel</i>					
75.	Does the plan specify sources from where additional health care workers could be recruited (volunteers, retired staff, training additional workers etc)?	X			
<i>Excess Mortality</i>					
76.	Is there a protocol for safe handling of corpse, including storage and disposal?	X			
Indicators for Communication					
77.	Does the plan specify communication plan for health and non-health authorities?			X	
78.	Does the plan specify communication plan for international agencies (WHO, FAO)?		X		
79.	Does the plan specify communication plan for policy makers?	X			
80.	Does the plan specify communication plan for the public and risk groups			X	

		Scores			
		0	1	2	3
81.	Does the plan specify communication plan for the media?		X		
82.	Does the plan outline mechanism for communication and information sharing between national/local authorities, regional authorities, WHO and other UN agencies?		X		
83.	Does the plan have pandemic communication committee/spokesperson		X		
84.	Are the roles and responsibilities of the pandemic communication committee/coordinator identified and mentioned in the plan?		X		
85.	Does the plan specify the roles of civil society and other community organization in public education or communication?		X		
86.	Are public communication messages for each phase of the pandemic clearly identified in the plan	X			
87.	Are communication channels clearly identified in the plan?	X			
88.	Does the plan ensure delivery of public communication message to hard to reach or minority groups such as refugees, displaced persons, migrants, ethnic minorities etc.)?	X			
89.	Is there any plan to update communication messages with available new knowledge or feedbacks from the public, health sector, other stakeholders etc.?	X			