

I HEREBY APPROVE

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**THE NATIONAL INFLUENZA PANDEMIC
PREPAREDNESS PLAN FOR POLAND**

PREPARED BY:

The National Influenza Pandemic Committee

ON THE BASIS OF THE PROJECT

PREPARED BY:

The National Influenza Center

**Chair of
The National Influenza Pandemic Committee
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References

Legal acts and documents indicating the necessity of preparation and implementation of the National Influenza Pandemic Preparedness Plan:

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A. INTRODUCTION

Influenza remains one of the most important medical problems of present times. Its incidences appear in every latitude and age group. According to the most recent WHO data, there are from about 330 to 990 million influenza sufferers, whereas from 0.5 to 1 million die due to postinfluenzal complications. The United States themselves experience about 36,000 deaths caused by influenza or postinfluenzal complications per year. In Poland the influenza incidence ranges from a few hundred to a few million cases, depending on epidemiological season. This data, however, appears to be underestimated due to the fact that a considerable number of patients avoids seeing a physician fearing financial loss resulting from being on sick leave.

Influenza incidences are caused by viruses from Orthomyxoviridae family. On the basis of antigenic differences in structural proteins, i.e. nucleoprotein and matrix protein, they can be classified into three types: type A, type B and type C. Influenza B viruses appear in humans, influenza C viruses both in humans and pigs, whereas influenza A viruses in humans, birds, pigs, horses and marine mammals. Considering differences in surface glycoproteins, i.e. hemagglutinin and neuraminidase in influenza A viruses, there are 15 subtypes of hemagglutinin (H1-H15) and 9 subtypes of neuraminidase (N1-N9). However, in humans there have been isolated so far the strains of subtypes A(H1N1), A(H2N2), A(H3N2) and A(H1N2), as well as the strains of subtypes A(H5N1), A(H9N2) and A(H7N7), until now appearing only in birds.

Influenza viruses are characterised by their high changeability, which applies most of all to hemagglutinin (HA) and neuraminidase (NA). The changes may be determined as antigenic drift, consisting in accumulation of point mutations in genes encoding HA and NA or as antigenic shift. The latter are caused by genetic reassortation, i.e. replacement of complete fragments of single-stranded RNA, which in type A and B viruses is present in eight segments, whereas in influenza C viruses in seven segments respectively. Whereas type C viruses in humans induce benign illnesses, type A viruses are responsible for the most severe infections. Due to the existence of the animal reservoir of influenza A viruses, different animal influenza A subtypes may reassort with human influenza A subtypes, resulting in creation of new influenza strains with unprecedented hemagglutinin and/or neuraminidase subtype. Such a new strain is likely to become a potentially pandemic one, as most of the population might have little or no immune protection against it. Genetic reassortation of strains very often occurs in pigs (considered as “mixing vessel”), which are susceptible both to human and avian influenza viruses. It cannot be excluded, as it did happen in the past, that an animal influenza virus may cross the species barrier and may be transmitted to a human organism without prior reassortation with any other human influenza virus strain.

It is likely indeed that a new influenza virus strain, capable of inducing a world-wide epidemic (pandemic), will occur one day. Such a strain may be characterized by a new hemagglutinin and/or neuraminidase subtype, different from the currently known human influenza virus strains, and by high incidence and mortality. No answer is known, however, to the question when it will occur.

With all due determination it should be stated that **the outbreak of influenza pandemic will introduce dramatical changes to the functioning of a state. Still, the peril of influenza pandemic outbreak and of using influenza virus in a terrorist attack remains underestimated and omitted. The consequences of such a mistake may become tragic one day.**

An influenza pandemic is likely to occur when:

- due to intense shifts there appears an influenza virus strain with other hemagglutinin and/or neuraminidase subtype than the already circulating influenza virus strains,
- the society consists of a significant number of people susceptible to the new strain, i.e. the majority of population shows low or no level of the new virus' antibodies,
- the new virus displays high capacity of transmission and disease inducing,
- the new virus' subtype causes high incidence in more than one country.

The high possibility of a potential influenza pandemic outbreak was confirmed in 1997 in Hong Kong, where eighteen people were infected and six of them died due to the influenza virus strain A/Hong Kong/156/97 (H5N1), until then appearing only in birds. The mass chicken slaughter, which followed these incidences, as well as the withdrawal and elimination of these animals from the market and chicken farms, prevented further human infections. A similar situation was observed in 1999, when other avian influenza virus strain A/Hong Kong/1074/99 (H9N2) was isolated in humans. In February 2003 two further deaths of an 8-year-old girl and her 33-year-old father were reported from Hong Kong. The deceased died of the same virus subtype as those in 1997, i.e. of A(H5N1). Successive alarming reports were coming from the Netherlands, where since the beginning of March 2003 there were 89 confirmed cases of infections caused by a highly pathogenic avian influenza virus A(H7N7). One person died due to the infection and there were several, highly alarming, confirmed cases of virus A(H7N7) human-to-human transmission. Further cases of influenza virus A(H5N1) infections were registered in Thailand, Vietnam and Cambodia, where from December 2003 to May 2005 there were overall 97 such cases, with 53 deaths confirmed (data of 19th May 2005). It is expedient to point out that a double infection caused simultaneously by a human and an avian virus is likely to lead to genetic reassortation and to the creation of a new virus subtype, which may become extremely dangerous for humans.

Therefore, as early as in 1999, the World Health Organization prepared the *Influenza Pandemic Plan. The role of WHO and Guidelines for National and Regional Planning* (WHO/CDS/CSR/EDC/99.1, Dept. of Communicable Disease Surveillance and Response, WHO, Geneva, Switzerland, April 1999), containing guidelines for preparing national and regional pandemic plans and for establishing multidisciplinary national pandemic planning committees. In April 2005 this document was replaced by a new, updated one, entitled *WHO global influenza preparedness plan. The role of WHO and recommendations for national measures before and during pandemics* (WHO/CDS/CSR/GIP/2005.5, Dept. of Communicable Disease Surveillance and Response, Global Influenza Programme, WHO, Geneva, Switzerland, 2005).

The pandemic plans first and foremost aim at:

- minimizing the number of incidences and deaths by gaining a satisfying level of immunization of the population due to influenza prophylaxis and use of antivirals,
- optimising medical care and appropriate facilities sufficient for a large number of patients,
- maintaining the infrastructure and fundamental elements of the society's functioning.

In 20th century there were four influenza pandemics: the Spanish Flu in 1918 (around 50 million of deaths), the Asian Flu in 1957 (around 1 million of deaths), the Hong Kong Flu in 1968 (around 700,000 of deaths) and the Russian Flu in 1977. During the Spanish Flu pandemic one fourth of the world population fell ill and a half was infected. The mortality rate during the second wave reached from 120/1000 (children of age 0-4) to 150/1000 (adults of age 25-29). During the Asian Flu pandemic about 25-30% of the world population was affected, whereas during the Hong Kong Flu – about one fifth.

Despite considerable progress that has been made since then in medical science, a well-prepared national pandemic plan becomes essential, especially when considering modern widely-developed communication chains. It can be safely assumed that in the days of air travel the time remaining for taking proper pandemic actions will not be long. Furthermore, it should be pointed out that at present the production process of a trivalent influenza vaccine on chick embryos takes at least 6 months. However, the experience gained in 1997 has shown that preparing well-replicating reassortants for influenza virus H5N1 was both difficult and time-consuming, due to technical problems (e.g. its toxicity towards chick embryos). It took more than a year since first influenza cases in May 1997 before reagents for experimental vaccine production became available. Thus, it is likely that the fast production of even a monovalent vaccine against a pandemic strain may not be possible. Soon, influenza vaccines will be produced not only of chick embryos, but of tissue cultures as well, which shall accelerate and facilitate the production, as well as it shall enable to avoid the problems that occurred in 1997. Regardless of this fact, however, the national influenza pandemic plans shall also take into consideration other ways of controlling infections and incidences caused by a pandemic strain, i.e. using neuraminidase inhibitors, such as oseltamivir and zanamivir, and M2 protein inhibitors, such as amantadine and rimantadine.

The present National Influenza Pandemic Preparedness Plan is a preliminary plan, thus requiring future systematic supplementing, extending and updating resulting from the cooperation between the National Influenza Center and respective bodies, institutions and units, which take part in the work of the National Influenza Pandemic Committee, set out pursuant to the Disposition of the Minister of Health of 25 March 2005 (Official Journal of the Ministry of Health of 2005, No 5, item 14).

B. PANDEMIC PHASES

| PANDEMIC PHASES | ADDITIONAL NATIONAL SUBDIVISIONS OF PANDEMIC PHASES |
|---|---|
| I. INTERPANDEMIC PERIOD | |
| <p>PHASE 1 No new influenza virus subtypes have been detected in humans. An influenza virus subtype that has caused human infection may be present in animals. If present in animals, the risk* of human infection or disease is considered to be low.</p> | |
| <p>PHASE 2 No new influenza virus subtypes have been detected in humans. However a circulating animal influenza virus subtype poses a substantial risk* of human disease.</p> | Affected or extensive travel/trade links with affected country. |
| | Not affected. |
| II. PANDEMIC ALERT PERIOD | |
| <p>PHASE 3 Human infection(s) with a new subtype but no human-to-human spread, or at most rare instances of spread to a close contact.**</p> | Affected or extensive travel/trade links with affected country. |
| | Not affected. |
| <p>PHASE 4 Small cluster(s) with limited human-to-human transmission but spread is highly localized, suggesting that the virus is not well adapted to humans.**</p> | Affected or extensive travel/trade links with affected country. |
| | Not affected. |
| <p>PHASE 5 Larger clusters but human-to-human spread still localized, suggesting that the virus is becoming increasingly better adapted to humans, but may not yet be fully transmissible (substantial pandemic risk).**</p> | Affected or extensive travel/trade links with affected country. |
| | Not affected. |
| III. PANDEMIC PERIOD | |
| <p>PHASE 6 Pandemic: increased and sustained transmission in general population.**</p> | Not yet affected. |
| | Affected or extensive travel/trade links with affected country. |
| | Subsided |
| | Next wave. |
| IV. POSTPANDEMIC PERIOD | |
| Return to interpandemic period. | Return to interpandemic period. |

- * The distinction between **PHASE 1** and **PHASE 2** is based on the risk of human infection or disease resulting from circulating strains in animals. The distinction is based on various factors and their relative importance according to current scientific knowledge. Factors may include pathogenicity in animals and humans, occurrence in domesticated animals and livestock or only in wildlife, whether the virus is enzootic or epizootic, geographically localized or widespread, and/or other scientific parameters.
- ** The distinction between **PHASE 3**, **PHASE 4** and **PHASE 5** is based on an assessment of the risk of a pandemic. Various factors and their relative importance according to current scientific knowledge may be considered. Factors may include rate of transmission, geographical location and spread, severity of illness, presence of genes from human strains (if derived from animal strains), and/or other scientific parameters.

C. THE NATIONAL INFLUENZA PANDEMIC COMMITTEE

The National Influenza Pandemic Committee is an auxiliary body of the Minister of Health and operates on the legal basis of the Disposition of the Minister of Health of 25 March 2005 on establishing the National Influenza Pandemic Committee.

In accordance to the Disposition, the National Influenza Pandemic Committee is composed of:

1. Chair - Mr Zbigniew Podraza, Secretary of State of the Ministry of Health;
2. Deputy Chair - Mr Andrzej Trybusz, Chief Sanitary Inspector;
3. Secretary - Mr Paweł Abramczyk - representative of the Department of Defence Matters at the Ministry of Health;
4. Mr Józef Piotr Knap – Chief Sanitary Inspector’ Advisor;
5. Mr Wojciech Dębiński – Director of the Department of Communicable Diseases Control at the Chief Sanitary Inspectorate;
6. Mr Zbigniew Niewójt - Director of the Department of Supervision at the Chief Pharmaceutical Inspectorate;
7. Mr Marek Chmielewski - representative of the Department of Public Health at the Ministry of Health;
8. Mr Marcin Wiśniewski - Deputy Director of the Department of Medicines’ Policy at the Ministry of Health;
9. Mr Włodzimierz Pisarski - Deputy Director of the Department of Health Care Organisation at the Ministry of Health;
10. Mr Dariusz Adamczewski - Director of the Department of Health Policy at the Ministry of Health;
11. Mr Piotr Rusecki - Chief Sanitary Inspector of the Polish Armed Forces;
12. Mr Maciej Kisiel - Chief Sanitary Inspector of the Ministry of Interior and Administration;
13. Mr Jan K. Ludwicki – Director of the National Institute of Hygiene;
14. Ms Agnieszka Gutowska – Vice-president of the Material Reserves Agency;
15. Mr Andrzej Koronkiewicz – President of the Office for Registration of Medicinal Products, Medical Devices and Biocidal Products;
16. Mr Mirosław Mioduszcwski – Chief Doctor of the Ministry of Foreign Affairs ;
17. Mr Andrzej Zieliński – National Consultant in Epidemiology;
18. Mr Andrzej Gładysz - National Consultant in Communicable Diseases;
19. Mr Tadeusz Wijaszka – Director of the National Veterinary Research Institute ;
20. Ms Lidia Bernadetta Brydak – Head of the National Influenza Center at the National Institute of Hygiene.

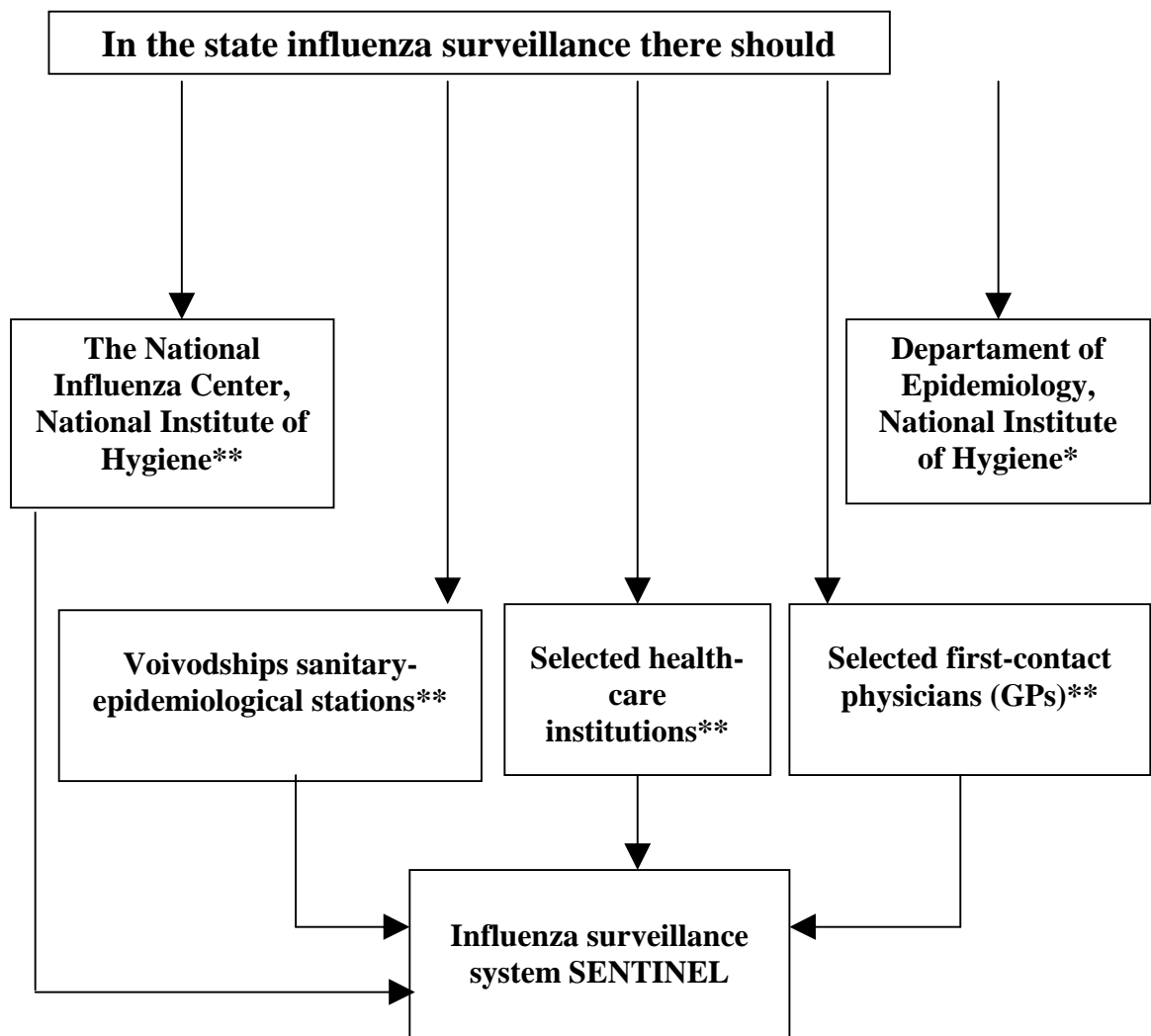
THE NATIONAL PANDEMIC COMMITTEE

Furthermore, the work of the Committee is assisted by the WHO observer Ms Paulina Miśkiewicz, Liaison Officer of the WHO Liaison Office in Poland. . The Chair of the Committee is entitled to invite other persons to participate in the Committee's tasks and activities.

The sessions of the Committee are held at least once a quarter and in the case of a considerable increase in influenza cases at least once a week.

All decisions and actions related to influenza pandemic incidence, as well as all actions undertaken in interpandemic periods require close cooperation and constant exchange of information between the Committee members.

D. INFLUENZA SURVEILLANCE IN POLAND



* epidemiological surveillance

** epidemiological and virological surveillance

The influenza surveillance, comprising both epidemiological and virological surveillance, is conducted within a whole year, with special strengthening required during epidemiological season, i.e. conventionally from October to the end of April.

The overarching aim of the surveillance is the constant monitoring of influenza situation of the country, including the fastest as possible detection of a new, potentially pandemic virus' strain, an early recognition of the situation of an artificial human exposure (e.g. resulting from a terrorist attack) as well as an early recognition of the situation of animal-to-human transmission followed by further spread of the virus in humans.

Apart from the influenza surveillance at the national level, the National Influenza Center in the normal course monitors relevant information concerning current virus activity in the world (e.g. on WHO and EISS websites).

PRINCIPLES OF INFLUENZA SURVEILLANCE BASED ON THE *SENTINEL* SYSTEM

The *SENTINEL* system is an integrated epidemiological and virological surveillance system conducted on a given population representative of the whole country. In the system there should participate 1-5% of the country physicians as well as Voivodship Sanitary-Epidemiological Stations (VSESs), both coordinated by the National Influenza Center. An integrated and representative system is essential for early warning system in epidemic and anticipated pandemic of influenza.

Epidemiological surveillance

Data concerning new influenza/influenza-like cases are to be collected by the physicians participating in the *SENTINEL* system. They are collected from the following age groups: 0-4, 5-14, 15-64 and ≥ 65 years of age, for each week of the year, i.e. from Monday to Sunday (according to the weeks' calendar numeration). Next, accompanied with the data concerning the number of patients attributed to a given physician, they are sent to relevant VSESs.

On the basis of the received data each VSES prepares a comprehensive report for a given week of the year (according to the weeks' calendar numeration) and sends it within a set date to the National Influenza Center. The National Influenza Center compiles a weekly report for the whole country, which is then forwarded to the European Influenza Surveillance Scheme, WHO and National Influenza Centers in other countries.

Virological surveillance

The physicians taking part in the *SENTINEL* system are obliged to take samples from the patients with influenza and influenza-like symptoms. The samples are then examined by relevant VSESs and the National Influenza Center.

The virological surveillance comprises:

- isolation of influenza virus strains as well as other virological (immunofluorescence, RT-PCR) and serological diagnostics of samples taken from the patients with influenza and influenza-like symptoms,
- information concerning the results of the performed virological and serological tests, forwarded in weekly reports (according to the weeks' calendar numeration) from VSESs to the National Influenza Center in due time,
- influenza virus strains isolated by VSESs or, if needed, by other units, are immediately sent to the National Influenza Center, which carries out antigenic and/or genetic analysis of the isolated strains in order to determine their type and subtype,
- the isolated influenza virus strains, including non-definable ones, are immediately sent to by the National Influenza Center to the WHO Collaborating Centre for Reference and Research on Influenza, National Institute for Medical Research (NIMR) in London,
- in each epidemiological season VSESs perform serological review of the sera taken from patients in the following age groups: 0-3, 4-7, 8-14, 15-25, 26-44, 45-64 and ≥ 65 years of age,
- on the basis of the reports received from VSESs as well as the data collected through own research and tests, the National Influenza Center compiles a weekly report for the whole country, which is then forwarded to the EISS, WHO and National Influenza Centers in other countries together with the epidemiological report.

TYPE OF MATERIAL FOR TESTING AND DIAGNOSTIC METHODS

1. Material for virological and serological tests

- nasal swabs
 - pharyngeal swabs
 - nasal and pharyngeal swabs
 - aspirate from nasopharynx
 - washings from nasopharynx
- } in the case of respiratory system symptoms
- bronchial tree washings
 - pericardial fluid
 - cerebrospinal fluid
 - biopsy specimen from cardiac muscle
 - biopsy specimen from lung tissue
 - biopsy specimen from muscles
- } in the case of specific postinfluenzal complications
- trachea
 - lungs
 - muscles
 - heart
 - brain
- } material taken during autopsy
- two serum samples taken during the acute period of the disease and during convalescence period

2. Methods

- virus isolation on MDCK cell culture or chick embryos
- detection of influenza virus antigen by immunofluorescence test (IF)
- detection of influenza virus genetic material by RT-PCR
- detection of influenza virus antigen by fast near-patient tests, which shall cannot be applied as the only diagnostic method; its results should be confirmed by isolation, IF, or RT-PCR:
 - AB Flu OIA (Biostar)
 - Directigen Flu A and Directigen Flu A+B (Beckton Dickinson)
 - Quickvue Influenza (Quidel)
 - ZstatFlu (Zymetex)
 - Influenza A/B Rapid test (Roche) (non-commercial sets)
 - other
- serological methods: hemagglutination inhibition test and ELISA tests

PRINCIPLES OF EPIDEMIOLOGICAL SURVEILLANCE APART FROM THE *SENTINEL* SYSTEM

All physicians in Poland are obliged to report cases and suspected influenza cases in the following age groups: 0-4, 5-14, 15-24, 25-44, 45-64 and ≥ 65 years of age. The reported data are sent to relevant Poviats Sanitary-Epidemiological Stations (PSESs) and then forwarded to relevant VSESs, which again pass them to the Department of Epidemiology at the National Institute of Hygiene.

On the basis of the received data the Department of Epidemiology compiles reports on disease incidences: from October to April for 1st-7th day of a month, 8th-15th day of a month, 16th-22nd day of a month and 23rd-30th/31st day of a month. Apart from weekly reports the Department of Epidemiology prepares biweekly, quarterly, semi-annual and annual reports.

ANIMAL INFLUENZA SURVEILLANCE

Due to the existing reservoir of the animal influenza viruses and especially avian ones, there is a need for permanent cooperation and information exchange with the Ministry of Agriculture and Rural Development and its subordinate agencies, including veterinary services responsible for animal influenza surveillance and animal influenza viruses' research.

E. NECESSARY ACTIONS FOR INFLUENZA PANDEMIC PREPAREDNESS

Appropriate preparation of the country to a pandemic indubitably requires:

1. strengthening of the influenza surveillance system, which proper functioning requires:
 - creating the influenza surveillance system on the basis of *SENTINEL* system;
 - designating in each voivodship an adequate number of physicians to take part in *SENTINEL* system;
 - providing VSESs with necessary laboratory equipment and reagents enabling them to participate in the national influenza surveillance:
 - biological safety cabinets of II class¹,
 - two-chamber CO₂ water-jacketed incubators²,
 - microscopes with fluorescence device³,
 - culture microscopes⁴,
 - incubators for +37°C and +35°C with cooling⁵
 - refrigerator-freezers⁶
 - low-temperature freezers –86°C⁷,
 - vessels for storing samples in liquid nitrogen⁸;
 - equipping the National Influenza Center with:
 - biological safety cabinets of II class laminary chambers of II class of biological security¹,
 - two-chamber incubators with water jacket CO₂ flow²,
 - refrigerator-freezer⁶,
 - two-sided autoclave⁹;
 - training the employees;
 - preparing appropriate procedures and training programmes.
2. determining availability of influenza vaccine, antivirals (inhibitor of influenza virus' neuraminidase - oseltamivir, inhibitors of M2 protein – amantadine and rimantadine) and other pharmaceuticals;
3. developing fast procedures enabling purchase of new pharmaceuticals for emergency use;
4. developing strategies for vaccinations and use of antivirals, including:
 - determining real range of vaccinations⁷,
 - defining high-risk groups to be vaccinated or offered antivirals in first order,
 - determining the way of distribution of vaccines and antivirals, with due consideration to available resources;
5. planning logistic actions connected with supplying influenza vaccines, antivirals, antibiotics, needles, syringes, protective clothing, etc., as well as assessing the cost of these materials, including costs of storage and transport;
6. determining availability of health care (hospitals, number of beds, intensive care, convalescence places) and of appropriate number of staff;
7. defining, in case of high mortality rate, the way of corpse storing, transport, traditional burial or cremation;
8. developing procedures of informing the public, including rapid contradicting of rumours and preventing possible panic spreads;

NECESSARY ACTIONS FOR INFLUENZA PANDEMIC PREPAREDNESS

9. defining sources and means of financing respective actions;
10. establishing precise time frameworks necessary for collection and implementation of the elements of the National Influenza Pandemic Preparedness Plan, as well as for their review and update;
11. ensuring fast exchange of information, including electronical communication channels;
12. exchanging the national pandemic plans with neighbouring countries in order to harmonise actions within a given region;
13. developing procedures related to possible quarantine and confinement of persons suspected of having contact with avian influenza virus.

¹ essential for fulfilling primary standards of laboratory work, including work with contagious material; serves to ensure necessary laboratory cleanliness in maintaining tissue cultures, isolating influenza virus on chick embryos and tissue cultures, performing of serological tests, operating on a potentially contagious material taken from a patient and many other, as well as ensures safe working conditions for the staff, protecting it from possible infections.

² essential in working on cell cultures, including isolating and multiplying influenza virus; two-chamber incubators are necessary for cultures requiring different incubation temperature (non-infected versus infected culture).

³ essential for observing preparations analysed with immunofluorescence method.

⁴ essential for observing cell cultures.

⁵ essential for incubating chick embryos, which serve to multiply and isolate influenza viruses as well as for performing immunofluorescence test.

⁶ essential for storing reagents and tests.

⁷ essential for storing materials taken from the patients and influenza viruses.

⁸ essential for storing cell cultures on low levels of passage.

⁹ essential for neutralising contagious and potentially contagious material.

F. TARGET POPULATION FOR INFLUENZA VACCINATIONS AS WELL AS FOR ANTIVIRALS PROPHYLAXIS AND TREATMENT IN PANDEMIC SITUATION

1. Vaccinations

During the pandemic a monovalent vaccine shall be produced, offering protection against the influenza pandemic virus strain.

The following section presents the influenza vaccination target population in due order:

a. Persons who, due to their place and type of occupation, participate in the pandemic spread, including the groups highly risking postinfluenzal complications or decease in the aftermath of the influenza infection

- Health care employees (doctors, nurses and remaining hospital and health care unit staff, including emergency service),
- Nursing home staff as well as the staff of other institutions for chronic disease or aged patients and other persons taking care of high-risk group patients (including household members),
- Armed forces,
- The police,
- State Fire Service employees,
- Border Guards,
- Custom Officers,
- Administration employees,
- Transport employees.

b. Persons belonging to the high-risk groups of postinfluenzal complications or decease in the aftermath of the influenza infection

- Patients with chronic cardiovascular and respiratory system diseases (including asthma) as well as patients with renal failure, metabolic diseases (including diabetes) and haemoglobinopathy,
- Patients with immunological deficiency (including those caused by immunosuppression treatment),
- Children and youth from 6 months to 18 years of age,
- Patients chronically treated with acetylsalicylic acid increasing the risk of the Reye's syndrome occurrence in case of influenza infection,
- Persons above 50 years of age,
- Inhabitants of nursing homes and other institutions for chronic disease or aged patients,
- Pregnant women.

2. Antivirals prophylaxis and treatment

Considering economic reasons antivirals (oseltamivir, amantadine and rimantadine) shall be reserved for:

- Persons who cannot be vaccinated due to medical reasons,
- Situation when the vaccine shall not yet/already be available or if the number of available vaccine doses shall be insufficient to vaccinate all the persons from the target population groups enumerated above.

TARGET POPULATION FOR INFLUENZA VACCINATIONS AND PROPHYLAXIS

G. INTERPANDEMIC PERIOD – PHASE 1

No new¹influenza virus subtypes have been detected in humans.

An influenza virus subtype that has caused human infection or disease may or may not be present in animals. If present in animals, the risk of human infection or disease is considered to be low².

It is likely that influenza subtypes that have caused human infection and/or disease will always be present in wild birds or other animal species. Lack of recognized animal or human infections does not mean that no action is needed. Preparedness requires planning and action in advance.

OVERARCHING PUBLIC HEALTH GOAL:

Strengthen influenza pandemic preparedness at the global, regional, national and subnational levels.

I. PLANNING AND COORDINATION

National objectives:

1. To develop and maintain national influenza pandemic contingency plans which are in harmony with international plans.
2. To promote national and global capacity to respond to early reports of new influenza virus strains.
3. To develop effective mechanisms for mobilization and rapid deployment of resources to areas of need.
4. To develop effective mechanisms for decisionmaking and subsequent actions regarding national and international responses to influenza-related health emergencies, by strengthening intersectoral and intergovernmental cooperative arrangements that will identify and minimize the risk of human infection with a new influenza virus.

National actions:

1. Establish a national pandemic planning committee.
2. Advocate the importance of pandemic planning to relevant decision-makers.
3. Develop and periodically update national plans in close collaboration with relevant partners, including those outside the health sector, and with reference to current WHO guidance.
4. Ensure implementation of plans and preparedness activities at all levels of public authorities.

¹ Definition of new: a subtype that has not circulated in humans for at least several decades and to which the great majority of the human population therefore lacks immunity.

² The distinction between **phase 1** and **phase 2** is based on the risk of human infection or disease resulting from circulating strains in animals. The distinction is based on various factors and their relative importance according to current scientific knowledge. Factors may include pathogenicity in animals and humans, occurrence in domesticated animals and livestock or only in wildlife, whether the virus is enzootic or epizootic, geographically localized or widespread, other information on the virus genome and/or other scientific parameters.

5. Exercise pandemic plans and use the results to improve and refine plans and preparedness.
6. Identify, brief regularly and train key personnel to be mobilized in case of emergence of a new influenza virus strain.
7. Consider the development of a domestic stockpile (antivirals, personal protective equipment, vaccines, laboratory diagnostics, other technical support) for rapid deployment when needed.
8. Consider providing resources and technical assistance during pandemic alert periods to resource-poor countries with foci of influenza activity.
9. Ensure procedures for rapid sharing of specimens or isolates for virus characterization and development of diagnostics and vaccine.
10. Develop surge-capacity contingency plans for the internal management of domestic resources and essential workers during a pandemic.
11. Establish national guidance to address food safety, safe agricultural practices and other public health issues related to infected animals.

II. SITUATION MONITORING AND ASSESSMENT

National objectives:

1. To have available up-to-date information on trends in human infection with seasonal strains of influenza.
2. To be able to detect animal and human infections with new influenza virus strains, identify potential animal sources of human infection and assess the risk of transmission to humans.
3. To develop plans for ongoing assessment of impact and resource needs during the pandemic period.

National actions:

1. Develop robust national generic surveillance systems for the detection, characterization and assessment of clusters of influenza-like illness or respiratory deaths, with provision for surge capacity and intersectoral and interinstitutional collaboration.
2. Develop or strengthen national systems for influenza surveillance in both humans and animals, based on WHO, FAO and OIE guidance.
3. Report routine and unusual surveillance findings to relevant national and international authorities.
4. Characterize and share influenza virus isolates and information on circulating strains with relevant international agencies, such as WHO, FAO and OIE.
5. Assess burden of seasonal influenza to help estimate additional needs during a pandemic.
6. Develop contingency plan for ongoing monitoring of information, for assessment of impact and resource needs during the pandemic phase (e.g. morbidity, mortality, workplace absenteeism, regions affected, risk groups affected, health-care workers and other essential workers' availability, health-care supplies, bed occupancy/availability, admission pressures, use of alternative health facilities, mortuary capacity).

III. PREVENTION AND CONTAINMENT

National objectives:

1. To agree in advance a range of containment strategies based on nonpharmaceutical public health actions.
2. To develop a strategy regarding stockpiling of antivirals and criteria for deployment.
3. To increase availability of vaccine in the event of a pandemic.
4. To develop national strategies and criteria for use of seasonal and pandemic vaccines.
5. To anticipate the possible need to develop a future pandemic vaccine.

National actions:

1. Develop national guidance for use of public health interventions, considering WHO recommendations.
2. Ensure that proposed interventions are discussed with responsible decision-makers in and outside the health sector (transport, education, etc.); ensure legal authority for proposed interventions; anticipate and address resource implications for implementation.
3. Conduct/observe table-top exercises and use the results to improve planning.
4. Develop a strategy to ensure access to antivirals for national use (e.g. stockpiling); ensure availability of data to project likely needs during higher phases.
5. Consider setting priorities and criteria for deployment and use of antivirals during pandemic alert and pandemic periods.
6. Consider participation in research projects to assess safety and antiviral drug resistance to current drugs.
7. Using national data on burden of influenza disease develop or adapt a national vaccination policy to achieve the targets recommended by the World Health Assembly for uptake of seasonal influenza.
8. Define national objectives for the use of pandemic vaccines; develop preliminary priorities for pandemic vaccine use, based on expected availability.
 - a). *Countries with vaccine manufacturing capacity.*

Define how to ensure access to vaccines, and fair and effective distribution to target population; consider supporting initiatives to increase global production by contributing to global vaccine research and/or by strengthening infrastructure.
 - b). *Countries without vaccine manufacturing capacity.*

Explore strategies to allow access to vaccines through bilateral agreements with manufacturers or manufacturing countries.
9. Review logistic and operational needs for implementation of pandemic vaccine strategy (vaccine storage, distribution capacity, cold-chain availability, vaccination centres, staffing requirements for vaccine administration).

IV. HEALTH SYSTEM RESPONSE

National objectives:

1. To ensure that up-to-date contingency plans and strategies are in place for pandemic response in the health-care sector.

National actions:

1. Benchmark health system preparedness with the help of the *WHO checklist for influenza pandemic preparedness planning*, and address deficiencies according to national resources.
2. Ensure that authorities, responsibilities and pathways are clearly identified for command and control of health systems in the event of a pandemic.
3. Identify priorities and response strategies for public and private health-care systems for each stage including where relevant: triage systems, surge capacity, human and material resource management.
4. Produce interim: case-finding, treatment and management protocols and algorithms; infection control guidelines; guidance on triaging; surgecapacity management and staffing strategies.
5. Ensure implementation of routine laboratory biosafety, safe specimen handling, and hospital infection control policies.
6. Estimate pharmaceutical and other materiel supply needs; commence arrangements to secure supply.
7. Increase awareness and strengthen training of health-care workers on pandemic influenza.
8. Exercise contingency plans regularly, including command-and-control pathways.

V. COMMUNICATIONS

National objectives:

1. To ensure that mechanisms exist for routine and emergency communications between health authorities, within and between government agencies, with other organizations likely to be involved in a pandemic response, and with the public.
2. To maintain an appropriate level of awareness among government and other essential partners.
3. To ensure collaborative working relationships with the media regarding epidemics, including the roles, responsibilities and operating practices of public health authorities.

National actions:

1. Establish phased national communications strategy for pandemic influenza.
2. Strengthen risk communication related to influenza, taking into consideration existing WHO guidance for outbreak communication and corresponding national contingency plans.
3. Plan and test capacity for meeting expected domestic information demands for diverse audiences, including professional/technical groups, the news media and general public.

4. Ensure communications infrastructure is adequate for pandemic needs.
5. Establish and maintain a web site with relevant information.
6. Establish networks among key response stakeholders, including risk communicators, non-health government departments, and professional and technical groups.
7. Familiarize news media with national plans, preparedness activities and decision-making related to seasonal and pandemic influenza.
8. Establish formal communications channels with WHO and other partners for sharing of outbreak information and coordination of communications strategy related to influenza.
9. Develop feedback mechanisms to identify public level of knowledge about pandemic influenza and emerging public concerns. Address rumours proactively, and correct misinformation.

H. INTERPANDEMIC PERIOD – PHASE 2

No new¹ influenza virus subtypes have been detected in humans.

However, a circulating animal influenza virus subtype poses a substantial risk² of human disease.

The presence of animal infection caused by a virus of known human pathogenicity may pose a substantial risk to human health and justify public health measures to protect persons at risk.

OVERARCHING PUBLIC HEALTH GOAL:

Minimize the risk of transmission to humans; detect and report such transmission rapidly if it occurs.

I. PLANNING AND COORDINATION

National objectives:

1. To ensure a heightened response capacity to address possible human cases.
2. To coordinate implementation of measures in close collaboration with animal health authorities in order to limit the risks of human infection.

National actions:

Affected countries or countries with extensive travel/trade links with affected countries.

1. Activate joint mechanisms for actions with animal health authorities and other relevant organizations.
2. Assess preparedness status and identify immediate actions needed to fill gaps (e.g. with the help of the *WHO checklist for influenza pandemic preparedness planning*).
3. Ensure ability to mobilize and rapidly deploy a multisectoral expert response team.
4. Ensure ability to rapidly deploy stockpile resources (national or from global pool) to field locations.
5. Decide whether to deploy part of the stockpile components according to risk assessment.
6. Establish a policy on compensation for loss of animals through culling, in order to improve compliance with emergency measures.

¹ Definition of new: a subtype that has not circulated in humans for at least several decades and to which the great majority of the human population therefore lacks immunity.

² The distinction between **phase 1** and **phase 2** is based on the risk of human infection or disease resulting from circulating strains in animals. The distinction is based on various factors and their relative importance according to current scientific knowledge. Factors may include pathogenicity in animals and humans, occurrence in domesticated animals and livestock or only in wildlife, whether the virus is enzootic or epizootic, geographically localized or widespread, other information on the virus genome and/or other scientific parameters.

II. SITUATION MONITORING AND ASSESSMENT

National objectives:

1. To identify interspecies transmission at an early stage and transmit this information to WHO and other appropriate partners.
2. To provide ongoing risk assessment for transmission of viruses with pandemic potential to humans.

National actions:

Affected countries or countries with extensive travel/trade links with affected countries.

1. Implement enhanced animal and human surveillance based on WHO, FAO and OIE recommendations; report results rapidly and regularly to the abovementioned international bodies.
2. Urgently transmit representative isolates from infected animals to WHO- and OIE-designated reference laboratories for confirmation, detailed characterization, development of diagnostic reagents and consideration of suitability for use to develop candidate vaccine viruses/prototype vaccine strains.
3. Urgently transmit representative isolates from suspected human cases of infection with an animal influenza virus strain to the National Influenza Center or other designated national laboratory for influenza.
4. Conduct field investigations (epidemiological, laboratory) in affected area to assess spread of the disease in animals and threat to human health.
5. Participate actively in assessment of the risk of transmission (e.g. animal models for pathogenicity testing).
6. Ensure expertise and capacity for virological surveillance in national laboratories according to standard procedures and using reagents provided by WHO- and OIE-designated reference laboratories.
7. Continue to collect and exchange virus isolates and other scientific information with partner organizations.
8. Conduct serological surveillance of farmers (including their families) and animal workers involved in containment of outbreaks of animal influenza.

III. PREVENTION AND CONTAINMENT

National objectives:

1. To minimize the risk of human infection from contact with infected animals.
2. To assess the national availability of antiviral drugs.
3. To reduce the risk of coinfection in humans and thereby minimize the opportunities for virus reassortment.

National actions:

Affected countries.

1. Ensure optimal response to the animal outbreak, including measures to reduce infection risk in those involved in the response (education and training regarding potential threat; correct use of personal protective equipment; deployment of antivirals if risk assessment indicates).

2. Recommend measures to reduce human contact with potentially infected animals (e.g. advice for travellers).
3. Prepare for use of further interventions if human infection is detected.
4. Update information on available national supplies of antivirals.
5. Update recommendations for prophylaxis and treatment with antivirals; consider implementation after formal risk assessment.
6. Ensure that antivirals component of a national or global stockpile could be deployed rapidly from a central location to the affected district(s), and that appropriate staff are familiar with guidance for deployment and use.
7. Review strategy for the use of interpandemic vaccines to prevent dual infection with human and animal viruses, and promote their use in defined risk groups.
8. Develop contingency plans for procuring seasonal vaccine (or specific vaccine if available) and for distribution once available.

Unaffected countries:

1. Establish or enhance mechanisms for exchange of epidemiological and virological data, and of infection control expertise/guidance with affected countries.

Countries with vaccine production capacity:

1. Review strategies for emergency production, licensing and testing of pandemic vaccine.

IV. HEALTH SYSTEM RESPONSE

National objectives:

1. To ensure that if human infections occur, they will be quickly recognized and that health system will respond appropriately.

National actions:

Affected countries or countries with extensive travel/trade links with affected countries.

1. Alert local health-care providers to: consider new influenza infection in ill patients with epidemiological link to affected animal species; implement infection control measures; report cases immediately to public health authorities.
2. Verify availability and distribution procedures for personal protective equipment and antivirals and for vaccine for the protection of persons at occupational risk; consider measures to implement.
3. Ensure rapid deployment of diagnostic tests when available.

All countries:

1. Alert health system to review preparedness plans and be ready to receive presumably small numbers of patients with new influenza subtype infection requiring isolation and clinical care.
2. Assess health system capacity to detect and contain outbreaks of human disease in hospital settings.
3. Alert local health-care providers to consider influenza infection in ill patients with travel or epidemiological link to an affected country, and to recognize the need for immediate reporting to national authorities.

V. COMMUNICATIONS

National objectives:

1. To ensure that appropriate information is shared rapidly among health authorities, other partners and the public.
2. To ensure that mechanisms exist for coordinating communications with the animal-health sector.

National actions:

Affected countries or countries with extensive travel/trade links with affected countries.

1. Establish rapid communications to answer questions from health-care providers and the public.
2. Communicate information on risk and prevention (risk of infection; safe food; animal handling) based on WHO recommendations.
3. Address possible stigmatization of individuals/populations in contact with the animal strain.

I. PANDEMIC ALERT PERIOD – PHASE 3

Human infection(s) with a new subtype, but no human-to-human spread, or at most rare instances of spread to a close contact³.

The occurrence of cases of human disease increases the chance that the virus may adapt or reassort to become transmissible from human to human, especially if coinciding with a seasonal outbreak of influenza. Measures are needed to detect and prevent spread of disease. Rare instances of transmission to a close contact – for example, in a household or health-care setting – may occur, but do not alter the main attribute of this phase, i.e. that the virus is essentially not transmissible from human to human.

OVERARCHING PUBLIC HEALTH GOAL:

Ensure rapid characterization of the new virus subtype and early detection, notification and response to additional cases.

I. PLANNING AND COORDINATION

National objectives:

1. To ensure that mechanisms exist so that imminent potential human health threats can be recognized and dealt with.
2. To coordinate timely interventions that will reduce the risk of a pandemic.

National actions:

Affected countries:

1. Activate national pandemic contingency planning arrangements.
2. Implement interventions to reduce disease burden in the initial foci and contain or delay the spread of infection.
3. Mobilize national response and provide guidance to relevant authorities in reviewing, updating and implementing contingency plans.
4. Brief appropriate officials in all relevant government departments at national and subnational levels, regarding the status of the incident and the potential need for additional resources, interventions and the use of emergency powers.
5. Provide assistance to regional, district and local authorities (including private essential services) in implementing measures and interventions.

³ The distinction between **phase 3**, **phase 4** and **phase 5** is based on an assessment of the risk of a pandemic. Various factors and their relative importance according to current scientific knowledge may be considered. Factors may include rate of transmission, geographical location and spread, severity of illness, presence of genes from human strains (if derived from animal strains), and/or other scientific parameters.

II. SITUATION MONITORING AND ASSESSMENT

National objectives:

1. To be able to exclude wider human-to-human transmission, and to detect this as soon as it occurs.
2. To be able to detect and characterize additional cases (including risk factors for transmission).

National actions:

Affected countries or countries with extensive travel/trade links with affected countries.

1. Confirm and report cases promptly using appropriate channels (e.g. International Health Regulations).
2. Exclude laboratory accident or intentional release as the cause of the human cases..
3. Determine the epidemiology of human cases (source of exposure; incubation period; infection of contacts (clinical and subclinical); period of communicability).
4. Establish national case definition (or review/modify existing definition) based on WHO guidance.
5. Assess clinical characteristics of infections in humans and share with relevant international partners.
6. Ensure rapid virological characterization of the virus responsible for human infection, in collaboration with WHO collaborating centres.
7. Enhance human and animal surveillance, including cluster detection.
8. Collaborate with international efforts to assess virus pathogenicity in humans.
9. Identify priority geographical areas and risk groups for targeting with preventive measures.
10. Assess effectiveness of treatment protocols and infection control measures and revise if necessary.
11. Conduct seroprevalence studies in risk groups, and then expand to the general population, to assess prevalence/incidence of infection (symptomatic and asymptomatic).
12. Continue to collect and share virus isolates and other information needed to develop or adjust diagnostic reagents and develop candidate vaccine viruses/prototype vaccine strains, and monitor any emerging antiviral resistance.

III. PREVENTION AND CONTAINMENT

National objectives:

1. To contain or reduce human-to-human virus transmission.
2. To limit morbidity and mortality associated with current human infections.
3. To assess the potential for use of antivirals in current and later phases.
4. To increase readiness for possible pandemic vaccine development.

National actions:

Countries with case(s):

1. Implement appropriate interventions as identified during contingency planning, in consultation with relevant partners.

2. Share virus isolates with WHO in a timely fashion to allow for potential pandemic vaccine development and updating of reagents.
3. If associated with animal outbreak(s):
 - (a) consider deploying supplies of antivirals for postexposure (and possibly pre-exposure) prophylaxis of individuals who are most likely to be exposed to the animal virus;
 - (b) continue promoting vaccination with seasonal influenza vaccine to limit risk of dual infection in those most likely to be exposed to the animal virus, and potentially decrease concurrent circulation of human strains in the outbreak-affected area.

All countries:

1. Assess/reassess availability of antivirals.
2. Review evidence base for effectiveness and safety of antivirals and if necessary reassess and review strategies, guidelines and priorities for use with partner organizations.
3. Reassess emergency methods to increase supply of antivirals, e.g. additional production facilities, investigatory new drugs.
4. Review vaccine use strategies with partner organizations.
5. Resolve liability and other legal issues linked to use of the pandemic vaccine for mass or targeted emergency vaccination campaigns, if not yet done.
6. Assess inventories of vaccines and other material resources needed to carry out vaccinations (e.g. syringes).
7. Consider supporting development of prototype vaccines.

IV. HEALTH SYSTEM RESPONSE

National objectives:

1. To prevent nosocomial transmission and laboratory infections.
2. To ensure heightened awareness among healthcare workers regarding the possibility of cases and/or clusters of cases.

National actions:

Affected countries:

1. Activate emergency coordinating committees (national, regional and local) and pre-established coordination between the health-care sector and relevant partner organizations.
2. Explore ways to provide drugs and medical care free of charge (or covered by insurance) to the patient and the health-care delivery system, in order to encourage prompt reporting of new cases.
3. Review contingency plans at all levels.
4. Test decision-making procedures and chains of command.
5. Train health-care workers to detect/identify clusters of cases.
6. Ensure implementation of infection-control procedures to prevent nosocomial transmission.
7. Ensure compliance with standards for biosafety in laboratories, and for safe specimen-handling and shipment.

All countries:

1. Provide public and private health-care providers with updated case definitions, protocols and algorithms to assist with case-finding, management, infection control and surveillance.
2. Assess capability/capacity for implementing infection control procedures for ill patients; implement infection control consistent with existing WHO guidance.

V. COMMUNICATIONS

National objectives:

1. To communicate transparently with the public regarding possible outbreak progression and contingencies to be expected.
2. To ensure rapid sharing of appropriate information among health authorities, other relevant government departments and other partners, including what is known and what is unknown.

National actions:

Affected countries:

1. Provide regular updates to WHO and other international and domestic partners on the evolving national situation.

All countries:

1. Identify target groups for delivery of key messages; develop appropriate materials, formats and language options.
2. Work with partners to ensure consistent messages are delivered.
3. Address the issue of stigmatization of individuals/families/communities affected by human infection with the animal strain.
4. Review and update information materials for news media, general public, health workers and policymakers.
5. Review communications systems and facilities to ensure that they are functioning optimally, and that contact lists are up to date.

J. PANDEMIC ALERT PERIOD – PHASE 4

Small cluster(s) with limited human-to-human transmission but spread is highly localized, suggesting that the virus is not well adapted to humans¹.

Virus has increased human-to-human transmissibility but is not well adapted to humans and remains highly localized, so that its spread may possibly be delayed or contained.

OVERARCHING PUBLIC HEALTH GOAL:

Contain the new virus within limited foci or delay spread to gain time to implement preparedness measures, including vaccine development.

I. PLANNING AND COORDINATION

National objectives:

1. To ensure that systems exist to detect and characterize outbreaks, and assess the risk of escalation into a pandemic.
2. To coordinate the implementation of procedures that will delay or contain the spread of human infection within limited foci.

National actions:

Affected countries:

1. Ensure highest levels of political commitment for ongoing and potential interventions/countermeasures.
2. Activate procedures to obtain additional resources.
3. Activate overarching national command and control of response activities.
4. Deploy operational response teams across all relevant sectors.
5. Ensure cross-border collaboration with surrounding countries for information-sharing and coordination of emergency responses.
6. Identify needs for international assistance.

Dotyczy krajów nie dotkniętych:

1. Activate national pandemic contingency planning arrangements.
2. Reassess current state of preparedness using the *WHO checklist for influenza pandemic preparedness planning* and national tools; implement actions required to close priority gaps.
3. Identify ability to respond to requests for international assistance.

¹ The distinction between **phase 3**, **phase 4** and **phase 5** is based on an assessment of the risk of a pandemic. Various factors and their relative importance according to current scientific knowledge may be considered. Factors may include rate of transmission, geographical location and spread, severity of illness, presence of genes from human strains (if derived from animal strains), and/or other scientific parameters.

II. SITUATION MONITORING AND ASSESSMENT

National objectives:

1. To assess the extent of human-to-human transmission.
2. To detect, notify and characterize additional clusters (including the identification of risk factors and other data concerning transmission as requested by WHO).
3. To assess the threat to human health and the impact of any control measures, and identify resources required for enhanced control.

National actions:

Affected countries:

1. Describe and (re)assess the epidemiological, virological and clinical features of infection; identify possible source(s).
2. Report this information on cases and clusters through appropriate mechanisms, e.g. International Health Regulations, to WHO and other appropriate bodies.
3. Expand activities already under way in pandemic alert period **phase 1**; adjust case definition if necessary.
4. Assess sustainability of human-to-human transmission.
5. Conduct clinical research to optimize treatment protocols, if resources available.
6. Collect and share strains and information needed to develop or adjust diagnostic reagents and prototype vaccines.
7. Forecast likely impact of the spread of infection.
8. Attempt to assess the impact of containment measures to allow for adjustment of recommendations; share findings urgently with the international community (including WHO) to allow updating of national and international policies.
9. Enhance surge capacity for surveillance.

Unaffected countries:

1. Enhance surveillance, especially in countries with extensive travel/trade links to affected areas.

III. PREVENTION AND CONTAINMENT

National objectives:

1. To contain or delay human-to-human virus transmission.
2. To limit morbidity and mortality associated with current human infections.
3. To assess the potential for wider usage of antivirals in later phases.
4. To increase readiness for pandemic vaccine production and deployment.
5. To gain early experience in pandemic vaccine use under field conditions (if clinical trial lots are available).

National actions:

Countries with cases:

1. Implement appropriate interventions identified during contingency planning, and consider any new guidance provided by WHO.
2. Evaluate the effectiveness of these measures in collaboration with WHO.

3. Use antivirals for early treatment of cases, and consider antiviral prophylaxis for close contacts of cases based on risk assessment and severity of illness in humans.
4. Assess likely effectiveness and feasibility of prophylaxis for the purpose of attempting to contain outbreaks. Determine target population; if intervention agreed, implement as an emergency measure; assess impact.
5. Consider deploying prototype pandemic vaccine if available.

Countries without cases:

1. Assess need to deploy current antiviral stock to local/regional level to facilitate rapid implementation of antiviral strategy (if this becomes necessary).
2. Consider supporting development or increased production of prototype vaccines.

IV. HEALTH SYSTEM RESPONSE

National objectives:

1. To prevent nosocomial transmission.
2. To ensure capacity is available and used optimally in affected countries.

National actions:

Affected countries:

1. Update and reinforce messages to local health-care providers to consider influenza infection in ill patients, and report findings to public health authorities.
2. Update case definition, protocols and algorithms for case-finding, management (antivirals and other required drugs), infection control and surveillance as required.
3. Activate contingency plans for response to overload of health facilities with influenza patients, and identify alternative strategies for case isolation and management.
4. Implement surge-capacity arrangements and contingency plans for staff shortages in health-care facilities and in all other key activity sectors.
5. Re-emphasize infection-control measures and issue stockpiles of personal protective equipment.

Unaffected countries:

1. Activate pandemic contingency planning arrangements.

V. COMMUNICATIONS

National objectives:

1. To ensure rapid sharing of appropriate information among health authorities, other relevant government departments and other partners, including what is known and what is unknown.
2. To prepare the public and partners for a possible rapid progression of events and possible contingency measures.

National actions:

Affected countries:

1. Reinforce and intensify key messages on prevention of human-to-human spread.

2. Explain rationale and update public on all aspects of outbreak response and likely next steps.
3. Provide instruction in self-protection.

All countries:

1. Update national authorities, other partner organizations/stakeholders and the public on the domestic and international epidemiological situation and known disease characteristics.
2. Activate emergency communications plans.
3. In conjunction with partner organizations, update communications messages.
4. Develop general health protection education materials, e.g. templates, for national and local applications.
5. Re-emphasize infection-control measures in the community, health-care settings, and long-term care facilities.

K. PANDEMIC ALERT PERIOD – PHASE 5

Larger cluster(s) but human-to-human spread still localized, suggesting that the virus is becoming increasingly better adapted to humans, but may not yet be fully transmissible (substantial pandemic risk).¹

Virus is more adapted to humans, and therefore more easily transmissible among humans. It spreads in larger clusters, but spread is localized. This is likely to be the last chance for massive coordinated global intervention, targeted to one or more foci, to delay or contain spread. In view of possible delays in documenting spread of infection during pandemic **phase 4**, it is anticipated that there would be a low threshold for progressing to **phase 5**.

OVERARCHING PUBLIC HEALTH GOAL:

Maximize efforts to contain or delay spread, to possibly avert a pandemic, and to gain time to implement pandemic response measures.

I. PLANNING AND COORDINATION

National objectives:

1. To coordinate and ensure maximum efforts to delay or possibly avert a pandemic.

National actions:

Affected countries:

1. As needed, designate special status to affected area in order to facilitate interventions (e.g. state of emergency).
2. Assist in the ongoing evaluation of interventions.
3. Finalize preparations for imminent pandemic, including activation of internal organizational arrangements (within command-and-control system) and staffing surge capacity.
4. Adjust and maximize efforts and resources to reduce disease burden and contain or delay the spread of infection.

¹ The distinction between **phase 3**, **phase 4** and **phase 5** is based on an assessment of the risk of a pandemic. Various factors and their relative importance according to current scientific knowledge may be considered. Factors may include rate of transmission, geographical location and spread, severity of illness, presence of genes from human strains (if derived from animal strains), and/or other scientific parameters.

II. SITUATION MONITORING AND ASSESSMENT

National objectives:

1. To determine pandemic risk and exclude spread to other countries/regions and to identify this as soon as it occurs.
2. To determine and monitor public health resources required for pandemic response.

National actions:*Affected countries:*

1. Expand and adjust activities in pandemic alert period, *phase 2*, to maximum intensity.
2. Report increased spread through appropriate means, including the revised International Health Regulations, as a public health emergency of international concern (PHEIC).
3. Implement real-time monitoring of essential resources (medical supplies, pharmaceuticals, infrastructure, vaccines, hospital capacity, human resources, etc.).
4. Conduct enhanced surveillance for respiratory disease through surveys (telephone or questionnaires).
5. Adjust forecasts of the likely impact of both infection spread and control measures.
6. Assess impact of containment measures to date in order to allow for readjustment if necessary; share findings with the international community to allow updating of national and international guidance/recommendations.
7. Monitor the development of antiviral resistance.

Unaffected countries:

1. Enhance surveillance measures to maximum intensity.

III. PREVENTION AND CONTAINMENT**National objectives:**

1. To make massive efforts to contain or delay human-to-human virus transmission and the onset of a pandemic.
2. To limit morbidity and mortality associated with current human infections.
3. To assess the potential for usage of antivirals in the pandemic period.
4. To support preparations for large-scale pandemic vaccine production and licensing, and prepare for deployment as supplies become available.
5. To gain early experience in pandemic vaccine use under field conditions (if clinical trial lots are available).

National actions:*Countries with cases:*

1. Implement interventions identified during contingency planning and new guidance provided by WHO.
2. Consider/reconsider use of antivirals for early treatment of cases (prioritization may need to be changed).
3. Assess/reassess efficacy and feasibility of prophylaxis for the purpose of attempting to contain outbreaks. Determine target population; if intervention agreed, implement as an emergency measure; assess impact.
4. Consider deploying prototype pandemic vaccine if available.

Countries without cases:

1. Reassess need to deploy current antiviral stock to local/regional level to facilitate rapid implementation of antiviral strategy (if this becomes necessary).

2. Consider results and lessons learned from use in countries with cases and modify antiviral strategy (if applicable).
3. If agreements already in place with manufacturer(s), consider recommending cessation of seasonal vaccine production and initiation of full-scale pandemic vaccine production.
4. Plan for vaccine distribution and accelerate preparations for mass vaccination campaigns (e.g. education, legal/liability issues) for when pandemic vaccine becomes available.
5. Adjust priority lists of persons to be vaccinated (if applicable).

If pandemic vaccine has already been developed:

1. Activate emergency procedures for rapid licensing and use of pandemic vaccines (all countries).
2. Consider allocating vaccine for population-based intervention aimed at containing infection within currently affected areas.
3. Consider implementing pandemic vaccine strategy as indicated in pandemic period.

IV. HEALTH SYSTEM RESPONSE

National objectives:

1. To ensure that health systems are ready to scale up response and implement changes in triage and treatment priorities, and that these actions occur as soon as a country becomes affected.
2. To prevent nosocomial transmission and maintain biosafety.

National actions:

Affected countries:

1. Full mobilization of health services and full implementation of emergency/contingency plans in affected areas, including coordination with other emergency sectors.
2. Commence triage arrangements and other emergency procedures for efficient use of health-care facilities.
3. Fully implement emergency plans for deployment of health-care workers.
4. Ensure attention to the health and other needs of persons in quarantine.
5. Arrange for additional human and material resources, and alternative means of health-care delivery, based on forecasted needs and contingency plans.
6. Implement corpse-management procedures.
7. Prepare health-care workers for potential change in policy regarding antivirals for occupational exposures (switch from prophylaxis to early treatment).

Unaffected countries:

1. Activate emergency coordinating committees (national, regional or other) for health system.
2. Provide public and private health-care providers with updated case definition, protocols and algorithms for case-finding, management, infection control and surveillance.

3. Explore ways to provide drugs and medical care free of charge (or covered by insurance) to the patient and the health-care delivery system, to encourage prompt reporting and enrolment.
4. Assess capability/capacity for infection control for ill patients, and implement infection control consistent with WHO guidelines.
5. Review contingency plans relevant to health system response at all levels, with special attention to surgecapacity arrangements.
6. Test decision procedures and chains of command, and other pandemic working arrangements to ensure that they are functioning.
7. Train health-care workers to detect/identify cases and clusters.

V. COMMUNICATIONS

National objectives:

1. To prepare the public and other partners for a likely rapid progression of events, additional contingency measures, and disruptions to normal life.
2. To ensure rapid sharing of appropriate information among health authorities, other relevant government departments and other partners, including what is known and what is unknown.

National actions:

1. Redefine key messages; set reasonable public expectations; emphasize need to comply with public health measures despite their possible limitations.
2. Utilize last “window of opportunity” to refine communications strategies and systems in anticipation of imminent pandemic.
3. Inform public about interventions that may be modified or implemented during a pandemic, e.g. prioritization of health-care services and supplies, travel restrictions, shortages of basic commodities, etc.

L. PANDEMIC PERIOD – PHASE 6

Increased and sustained transmission in the general population.¹

Major change in global surveillance and response strategy, since pandemic risk is imminent for all countries. The national response is determined primarily by the disease impact within the country.

OVERARCHING PUBLIC HEALTH GOAL:

Minimize the impact of the pandemic.

I. PLANNING AND COORDINATION

National objectives:

1. To provide leadership and coordination of multisectoral resources that will: minimize morbidity and mortality; preserve health-care system effectiveness; minimize societal disruption; and minimize the economic impact of a pandemic.
2. To ensure rational access to finite national resources, including pharmaceutical supplies and (when available) vaccine.
3. To evaluate the effectiveness of specific responses and interventions.
4. To establish and maintain trust across all agencies and organizations and with the public, through a commitment to transparency and credible actions.
5. To draw lessons from the ongoing pandemic response in order to improve response strategy and inform future planning.

National actions:

Countries not yet affected:

1. Activate crisis committee(s) and national command and control of emergency operations (if not already done).
2. Finalize adjustment of official guidelines and recommendations.
3. Provide guidance to local authorities in all sectors on implementation and evaluation of proposed interventions.

Affected countries:

1. Implement all relevant elements of national pandemic plan, including coordination of response and implementation of specific interventions
2. Assess and publicize the current and cumulative national impact.
3. Consider applying emergency powers.

¹ The distinction between **phase 3**, **phase 4** and **phase 5** is based on an assessment of the risk of a pandemic. Various factors and their relative importance according to current scientific knowledge may be considered. Factors may include rate of transmission, geographical location and spread, severity of illness, presence of genes from human strains (if derived from animal strains), and/or other scientific parameters.

Subsided (end of pandemic or between waves):

1. Determine need for additional resources and powers during subsequent pandemic waves.
2. Declare end of emergency command-and-control operations, states of emergency, etc.
3. Support rebuilding of essential services, including rotating rest and recuperation for staff.
4. Review national plan based on experiences.
5. Address psychological impacts.
6. Acknowledge contributions of all stakeholders (including the public) and essential staff towards fighting the disease.
7. Consider offering assistance to remaining countries with ongoing widespread activity.

II. SITUATION MONITORING AND ASSESSMENT

National objectives:

1. To monitor the epidemiological, virological and clinical features, and the course and impact of the pandemic at the national level, in order to forecast trends and optimize the use of finite resources.
2. To assess the effectiveness of interventions used to date in order to guide future actions.

National actions:

Countries not yet affected:

1. Continue enhanced surveillance measures as for *phase 5* (unaffected country).
2. Monitor global situation (vaccine/antiviral availability, recommendations for best practices, etc.).
3. Estimate the impact of vaccination and antiviral programmes used elsewhere (safety, efficacy and antiviral resistance).

Affected countries:

1. Monitor geographical spread of disease from point(s) of introduction/first detection.
2. Use enhanced surveillance and case-management database to identify initial cases/contacts and track initial geographical spread.
3. Monitor for possible changes in epidemiology, clinical presentation and virological features.
4. Monitor and assess national impact (morbidity, mortality, workplace absenteeism, regions affected, risk groups affected, health-care worker availability, essential worker availability, health-care supplies, bed occupancy/availability, admission pressures, use of alternative health facilities, mortuary capacity, etc.).
5. Assess need for emergency measures, e.g. emergency burial procedures, use of legal powers to maintain essential services.
6. If sufficient resources, forecast trends (course of pandemic) and economic impact.
7. Assess uptake and impact of: treatments and countermeasures, including vaccine/antiviral efficacy and safety and emergence of antiviral resistance; nonpharmaceutical interventions; etc.

8. As disease activity intensifies and becomes more widespread, adjust surveillance (e.g., reduce virological surveillance, discontinue case-management database) and adjust case definition to reflect increasing certainty of clinical diagnoses in absence of virological confirmation; switch to aggregate data collection on morbidity, mortality. Maintain sufficient virological surveillance to detect antigenic drift.

Subsided (end of pandemic or between waves):

1. Evaluate resource needs for subsequent waves if they occur.
2. Identify the most effective surveillance and control measures for subsequent pandemic waves.
3. Report current status through appropriate international mechanisms.
4. Review lessons learned.
5. Reinstate enhanced surveillance for early detection of subsequent wave.
6. Share experience gained with international community (lessons learned).

III. PREVENTION AND CONTAINMENT

National objectives:

1. To contain or delay spread using public health interventions, while limiting societal disruption.
2. To minimize morbidity and mortality through the rational use of available pharmaceuticals, e.g. vaccines and antivirals.

National actions:

As soon as possible (regardless of extent of disease activity):

1. Implement pandemic vaccine procurement plans; update vaccine recommendations; re-evaluate dosage and schedule based on available new data and WHO recommendations; plan logistics of delivery.
2. As soon as available, implement pandemic vaccine programme as availability/resources permit; evaluate safety and efficacy; monitor supply.

Countries not yet affected:

1. Implement appropriate public health interventions as identified during contingency planning and consider new guidance provided by WHO.
2. Review/update recommendations for use of antivirals based on: emerging data from affected countries; clinical studies; evidence of resistance; changes to WHO recommendations; availability and resources.
3. Implement distribution plan; monitor supply; be prepared to contribute to evaluation of safety and effectiveness.

Affected countries:

1. Implement appropriate public health interventions identified during contingency planning, and consider new guidance provided by WHO.
2. When possible, evaluate the effectiveness of such measures.
3. Re-evaluate use of antivirals based on clinical studies, evidence of resistance, changes to WHO recommendations and availability.

Subsided (end of pandemic or between waves):

1. Review effectiveness of treatments and countermeasures; update guidelines, protocols and algorithms.
2. Evaluate antiviral efficacy, safety and resistance data; review/update guidelines as necessary; assess supply for subsequent wave(s).
3. Assess vaccine coverage to date, efficacy and safety; review/update guidelines as necessary; begin vaccination of persons not yet immunized in line with plans, priority status and availability; consider incorporation of pandemic strain into seasonal vaccine.

IV. HEALTH SYSTEM RESPONSE

National objectives:

1. To optimize patient care with limited resources.
2. To reduce overall impact of the pandemic (morbidity and mortality).
3. To manage demand on health systems in order to maximize sustainability of response.

National actions:

Countries not yet affected:

1. Keep emergency coordinating arrangements and chains of command for health systems fully functional.
2. Keep case definition, protocols and algorithms for case-finding, management (including appropriate use of antibiotics to treat suspected bacterial infections), infection control and surveillance updated in line with latest WHO guidance.
3. Maintain health-care worker vigilance for the onset of cases and clusters.
4. Explore ways to provide drugs and medical care free of charge (or covered by insurance) to the patient and the health-care delivery system, to encourage prompt reporting and recognition of the start of pandemic activity.
5. Maintain capability/capacity for infection control for ill patients, and implement infection control consistent with latest WHO guidelines; maintain staff competency in use of personal protective equipment (conduct drills).
6. Keep under review plans relevant to health system response at all levels down to the smallest functioning health unit; maintain surge-capacity arrangements; prepare for imminent switch to pandemic working arrangements.

Affected countries:

1. Implement in full pandemic contingency plans for health systems and essential services, at national and local levels where affected; monitor health system status; adjust triage system if necessary; deploy additional workforce and volunteers; ensure staff support; provide medical and non-medical support for ill people in alternative (non-health-care) facilities if needed; provide social/psychological support for health-care workers, victims and communities.
2. If resources permit, collect available data on effectiveness and safety of clinical interventions and share these with areas not yet affected and WHO.
3. Implement vaccination campaign according to priority status, in line with plans and availability.

4. If resources permit, collect available data on effectiveness of clinical interventions and share these with WHO.

Subsided (end of pandemic or between waves):

1. Ensure that overworked staff have opportunities for rest and recuperation.
2. Restock medications and supplies; service and renew essential equipment.
3. Review/revise plans in anticipation of subsequent wave(s).
4. Support rebuilding of essential services.
5. Adjust case definitions, protocols and algorithms.
6. Continue with vaccination programme in line with plans, priority order and availability.

V. COMMUNICATIONS

National objectives:

1. To ensure public access to regularly-updated official national sources and focal points for credible, consistent information related to the pandemic.
2. To maintain open and accessible channels for advice to the public on specific subjects (e.g. travel, social gatherings, etc.).
3. To achieve public acceptance and support for national responses and contingency measures.
4. To ensure rapid sharing of information regarding progress of the pandemic among health authorities, other relevant government departments and other partners.

National actions:

Countries not yet affected:

1. Keep news media, public, professional partners and other stakeholders informed about progress of pandemic in affected countries; prepare audiences for imminent onset of pandemic activity.
2. Redefine key messages; set reasonable public expectations; emphasize need to comply with public health measures despite their possible limitations.
3. Utilize last “window of opportunity” to refine communications strategies and systems in anticipation of imminent pandemic.
4. Inform public about interventions that may be modified or implemented during a pandemic, e.g. prioritization of health-care services and supplies, travel restrictions, shortages of basic commodities, etc.

Affected countries:

1. Maintain capacity for meeting expected domestic and international information demands.
2. Activate all elements of communications plan.
3. Acknowledge public anxiety, grief and distress associated with pandemic.
4. Audit outcomes of communications activities to refine current response and inform future pandemic planning.

Subsided (end of pandemic or between waves):

1. Evaluate communications response during previous phases; review lessons learned.
2. Publicly address community emotions after the pandemic.
3. Make people aware of uncertainties associated with subsequent waves.

M. POSTPANDEMIC PERIOD

Return to interpandemic period.

N. RECOMMENDATIONS FOR NONPHARMACEUTICAL PUBLIC HEALTH INTERVENTIONS AND MEASURES

The following public health interventions and measures are based on the document *WHO consultation on priority public health interventions before and during an influenza pandemic*, Dept. of Communicable Disease Surveillance and Response, WHO, Geneva, Switzerland, 2004 (WHO/CDS/CSR/RMD/2004.9).

Measures at the national level (for persons living or travelling within an affected country).

| Measures/intervention | Pandemic alert period | | Pandemic period | Comments |
|--|-----------------------|---------------|-----------------|---|
| | Phase 3 | Phase 4 and 5 | Phase 6 | |
| Public health information: | | | | |
| Information for public on risk and risk avoidance (tailored to target population) | Y | Y | Y | |
| Information for professionals | Y | Y | Y | |
| Advice on universal hygiene behavior | Y | Y | Y | |
| Preparatory information on next phase | Y | Y | Y | |
| Measures to reduce risk that cases transmit infection | | | | |
| Confinement: - Confine cases (mild and severe) as appropriate to local situation; provide medical and social care. | Y | Y | Y | Need to plan for large numbers of severe cases. |
| Face masks ¹ : - Symptomatic persons. - Exposed persons: undertake risk assessment considering: evidence of human-to-human transmission; closeness of contact; frequency of exposure. | Y | Y | Y | Logistics need to be considered |
| - Persons seeking care (respiratory illness) in risk area (waiting room) | ± | ± | ± | Consider recommending masks based on risk assessment. |
| | Y | Y | Y | Need more data, especially on use by well person. |

INTERVENTIONS AND MEASURES

| Measures/intervention | Pandemic alert period | | Pandemic period | Comments |
|--|-----------------------|---------------|-----------------|---|
| | Phase 3 | Phase 4 and 5 | Phase 6 | |
| Measures to reduce risk that contacts transmit infection | | | | |
| Tracing and follow-up of contacts | Y | Y | N | Not feasible once pandemic starts |
| Voluntary quarantine (such a home confinement) of healthy contacts with health monitoring; provide medical and social care. | N | Y | N | Voluntary quarantine should also apply to contacts of known cases undergoing antiviral prophylaxis, as efficacy not known. |
| Self-health monitoring and reporting if ill but no restrictions on movement. | Y | ± | N | Not relevant for contacts in quarantine. |
| Advise contacts to reduce social restrictions. | N | NR | N | Not relevant for contacts in quarantine; see also measures to increase social distance. |
| Advise contacts to defer travel to unaffected areas. | N | NR | Y | Not relevant for contacts in quarantine. Precautionary principle when unclear whether human-to-human transmission is occurring; see also travel measures. |
| Provide contacts with antiviral prophylaxis. ² | Y | Y | N | Principle of early aggressive measures to avert pandemic. |
| Measures to increase social distance | | | | |
| Voluntary home confinement of symptomatic persons. | Y | Y | Y | Measures need to reduce risk of transmission to other household members |
| Closure of schools (including preschool, higher education) in conjunction with other measures (limiting after-school activities) to reduce mixing of children. | N | ± | ± | Depends on epidemiological context – extent to which these settings contribute to transmission. |

INTERVENTIONS AND MEASURES

| Measures/intervention | Pandemic alert period | | Pandemic period | Comments |
|--|-----------------------|---------------|-----------------|--|
| | Phase 3 | Phase 4 and 5 | Phase 6 | |
| Population wide measures to reduce mixing of adults (furlough non-essential workers, close workplaces, discourage mass gathering) ³ | N | ± | ± | Consider in certain circumstances – extent to which unlinked community transmission and transmission in workplaces occurs. |
| Masks in public places. | N | N | N | Not known to be effective; permitted but not encouraged. |
| Measures to decrease interval between symptom onset and patient isolation | | | | |
| Public campaign to encourage prompt self-diagnosis. | Y | Y | Y | |
| Urge entire population (affected area) to check for fever at least once daily. | N | N | N | |
| Set up fever telephone hotline with ambulance response | N | ± | N | |
| Set up fever clinics with appropriate infection control | N | ± | N | |
| Introduce thermal scanning in public places. | N | N | N | Not effective based on experience; also requires individual and public health action for identified febrile persons. |
| Disinfection measures: | | | | |
| Hand-washing. | Y | Y | Y | |
| Household disinfection of potentially contaminated surfaces. | Y | Y | Y | |
| Widespread environmental disinfection. | N | N | N | |
| Air disinfection | N | N | N | |
| Measures for persons entering or exiting an infected area within the country: | | | | |
| Advise to avoid contact with high risk environments (such as infected poultry farms live-poultry markets). | Y | Y | Y | |

INTERVENTIONS AND MEASURES

| Measures/intervention | Pandemic alert period | | Pandemic period | Comments |
|---|-----------------------|---------------|-----------------|---|
| | Phase 3 | Phase 4 and 5 | Phase 6 | |
| Recommended deferral of non-essential travel to affected areas. | N | Y | Y | If significant areas of country remain unaffected |
| Restrict travel to and from affected areas. | N | N | N | Enforcement of travel restrictions considered impractical in most countries but likely to occur voluntarily when risk appreciated by the public . |
| Cordon sanitaire. | N | N | N | Enforcement considered impractical. |
| Disinfection of clothing, shoes or other objects or persons exiting affected areas. | N | N | N | Not recommended for public health purpose, but may be required by veterinary authorities to prevent spread of infection in animals. |

INTERVENTIONS AND MEASURES

Measures at the international level.

| Measures/intervention | Pandemic alert period | | Pandemic period | Comments |
|--|------------------------|---------------|-----------------|---|
| | Phase 3 | Phase 4 and 5 | Phase 6 | |
| Measures at borders for persons entering or exiting a country | | | | |
| Information for travelers: | Y | Y | Y | Message must be tailored to phase. While travel would remain a matter of personal choice, transparency must be ensured in order to allow for informed decision-making. Consequences for the traveler may include personal risk to health and economic harm. |
| - Outbreak notice, | | | | |
| - Recommended that travelers to areas experiencing outbreaks of highly pathogenic avian influenza avoid contact with poultry farms and live animal markets.. | Y | Y | ± | |
| - Recommended deferral of non-essential international travel to affected areas. | N | Y | Y | |
| - Recommended deferral of non-essential international travel from affected areas. | see screening measures | | | |
| Measures at borders for persons entering or exiting a country | | | | |
| Information for travelers: | Y | Y | Y | Message must be tailored to phase. While travel would remain a matter of personal choice, transparency must be ensured in order to allow for informed decision-making. Consequences for the traveler may include personal risk to health and economic harm. |
| - Outbreak notice, | | | | |
| - Recommended that travelers to areas experiencing outbreaks of highly pathogenic avian influenza avoid contact with poultry farms and live animal markets.. | Y | Y | ± | |
| - Recommended deferral of non-essential international travel to affected areas. | N | Y | Y | |
| - Recommended deferral of non-essential international travel from affected areas. | see screening measures | | | |

| Measures/intervention | Pandemic alert period | | Pandemic period | Comments |
|---|-----------------------|---------------|-----------------|--|
| | Phase 3 | Phase 4 and 5 | Phase 6 | |
| Measures at borders for international travelers coming from or going to affected areas : | | | | |
| Health alert notices to travelers to and from affected areas. | N | Y | Y | WHO negotiates with appropriate organizations (e.g. international air transport association) to ensure that health alert notices are distributed; WHO facilitates shared notice formats among countries. |
| Medical surveillance: | | | | |
| - daily self-checking for fever, travelers for affected area; travelers to affected areas. | N | Y | Y | Contacts of confirmed cases should be encouraged to monitor health. Quarantine may be indicated. Persons on affected conveyance should be traced and similarly advised. |
| - Self-reporting if symptoms appear in travelers from affected areas. | N | N | Y | |
| - Advice on how to behave if ill after travel in affected areas (seek health care, give travel history, receive influenza laboratory test); if pandemic virus detected, patient should be isolated and public health officials, including WHO notified. | Y | Y | Y | |
| | Y | Y | Y | |

| Measures/intervention | Pandemic alert period | | Pandemic period | Comments |
|---|-----------------------|---------------|-----------------|--|
| | Phase 3 | Phase 4 and 5 | Phase 6 | |
| <p><i>Entry screening</i> for travelers coming from affected areas.</p> <ul style="list-style-type: none"> - Screening for symptoms (visual detection of symptoms). - - Screening for at-risk travelers (health declaration, questionnaire). - Thermal screening, - Medical examination. | N | N | N | <p>Due to lack of proven health benefit, practice should be permitted (for political reason, to promote public confidence) but not encouraged. Travelers should receive health alert notices instead.</p> <p>Entry screening may be considered where host country suspects that exit screening (see below) at traveler's point of embarkation is suboptimal.</p> |
| <p>Entry screening for geographically isolated infection-free areas (island), using the options above.</p> | N | Y | Y | <p>Feasible, may prevent entrance of pandemic virus. May also be relevant where country's internal surveillance capacity is limited.</p> |
| <p><i>Exit screening</i> for all travelers from areas with human infection.</p> | N | N | N | <p>More feasible that entry screening for detecting early cases.</p> |

| Measures/intervention | Pandemic alert period | | Pandemic period | comments |
|--|-----------------------|---------------|-----------------|--|
| | phase 3 | phase 4 and 5 | phase 6 | |
| - Screening of symptoms (visual detection of symptoms) | N | N | N | Not feasible due to passenger volume. |
| - Screening for at-risk travelers (health declaration, questionnaire). | N | Y | Y | |
| - Thermal scanning or ear-temperature measurement | N | Y | Y | Thermal scanning less sensitive and specific but may be more practical than ear-temperature scanning. |
| - Stop-list of isolated or quarantined persons, | N | N | N | May be feasible in certain countries, but generally not encouraged. |
| - Recommended that ill persons postpone travels, | Y | Y | Y | |
| - Medical examination for travelers at risk or with fever. | N | N | N | Not feasible to implement at borders. |
| Measures for countries with porous borders (including informal or illegal crossing points) adjoining affected areas | | | | |
| Raise awareness among health-care providers and general public to facilitate surveillance and response measures, such as social distancing, quarantine or isolation. | N | Y | Y | WHO to post relevant guidelines on web for use by countries in developing posters, mass-media messages and similar measures. Possible benefits include rumour control. |
| Recommend self-reporting if influenza-like symptoms appear. | N | Y | Y | |
| Separate sick travelers (if possible) on board. | N | Y | Y | On flights from affected areas, masks should be offered to all passengers upon boarding. |

INTERVENTIONS AND MEASURES

| Measures/intervention | Pandemic alert period | | Pandemic period | Comments |
|---|-----------------------|---------------|-----------------|--|
| | Phase 3 | Phase 4 and 5 | Phase 6 | |
| Advise health authority at countries of traveler's embarkation, destination and transit that a person on board is ill (airline is responsible to notify destination only) | Y | Y | Y | Established requirement for destination, but not uniformly observed in practice. |
| Share epidemiological information for contact tracing with national public health authorities. | N | Y | Y | Countries to share this information directly with others, as appropriate. |

Y- yes, N-no, ±-should be considered, NR-not relevant

¹ Quality and type of masks depend on risk group. Cases: surgical mask; health-care workers: N95 or equivalent; others: depends on risk.

² Implementation depends on adequate supplies and may require a global stockpile with a prenegotiated targeting and delivery strategy availability in the area where potential pandemic virus emerges. Prophylactic use will depend on evidence of effectiveness. Targeted use is required because of potential for drug resistance, side effects and limited supplies. Targeted use might consider: public prevention; protection of health care-workers; protection of other essential service providers; individual treatment.

³ Given a pandemic strain causing significant morbidity and mortality in all age groups and the absence of a vaccine, authorities should seriously consider introducing population-wide measures to reduce the number of cases and death. Decisions can be guided by mathematical and economy modeling. If modeling indicates a reduction in the absolute numbers of cases and deaths, decision to introduce measures involving multiple government sectors will then need to balance the protection of priority functions against the risk of social and economic disruption.

⁴ Could be considered as an emergency measure to avert or delay a pandemic.

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ANNEX 1

CONCLUSIONS AND RECOMMENDATIONS ADOPTED ON THE WHO CONSULTATION ON GLOBAL PRIORITIES IN INFLUENZA SURVEILLANCE AND CONTROL MEETING, HELD AT THE WORLD HEALTH ORGANIZATION, GENEVA, SWITZERLAND, 6-7 MAY 2002.

- I.** Accelerate National and International Action on Pandemic Preparedness
- II.** Strengthen Disease and Virological Surveillance Nationally and Internationally
- III.** Increase Influenza Vaccine Usage
- IV.** Increase Knowledge on the Health and Economic Burden of Influenza

I. Accelerate National and International Action on Pandemic Preparedness

Priority 1

Increase awareness of the need for pandemic planning

Required key actions:

- transform scientific message on pandemic preparedness into political action
- WHO to table pandemic preparedness at the World Health Assembly

Rationale:

Authorities must understand the potential impact and threat of pandemic influenza, so that they will see the importance of pandemic planning and provide enough resources to carry it out. With adequate preparation, the morbidity, mortality and social disruption associated with a pandemic should be reduced.

Priority 2

Accelerate the development and implementation of national pandemic plans

Required key actions:

- WHO to develop a model national plan and assist with regional planning
 - develop a tool for country self assessment of pandemic planning progress
 - exchange expertise / provide consultations in pandemic planning
- publish the progress/status of pandemic planning periodically.

Rationale:

WHO published the Pandemic Preparedness Plan in 1999, however only a few countries have begun pandemic planning. There are many obstacles to planning, especially in developing countries. Providing motivation and assistance will accelerate the planning process and decrease the risk of a world unprepared for the next pandemic.

Priority 3

Enhance the utilization of influenza vaccine and antivirals in the inter-pandemic period

Required key actions:

- set up a specific working group to develop guidelines for the use of antivirals
- enhance the surveillance of antiviral resistance
- provide assistance to countries where there is no existing or limited influenza vaccine manufacturing capacity and there is a wish to produce influenza vaccine.

Rationale:

Wide scale use of antivirals and vaccines during a pandemic will depend on familiarity with their effective application during the inter-pandemic period. The increasing use of these modalities will expand capacity and mitigate the morbidity and mortality of annual influenza epidemics. Studies conducted during the inter-pandemic period can refine the strategies for use during a pandemic.

Priority 4

Develop strategies for the utilization of vaccines and antivirals and securing adequate supplies for a pandemic

Required key actions:

- develop and rehearse strategies for emergency production, licensing and testing of vaccines and antivirals
- develop models and guidelines for the use of vaccines and antivirals when they are in short supply and adjust these at the start of the pandemic
- incorporate antiviral stockpiling into pandemic plans
- equity of supply between countries should be addressed by a multidisciplinary working group under the auspices of the WHO.

Rationale:

Vaccines will not be available at the start of a pandemic. The only specific intervention possible in the absence of vaccines would be the use of antivirals but their adequate availability requires stockpiling. It is essential that action is taken to accelerate availability of vaccines and antivirals and to develop guidelines for their use when they are in short supply.

Priority 5

Advocate research on pandemic viruses, vaccines, antivirals and other control measures

Required key actions:

- investigate mechanisms underlying the emergence of pandemic viruses
- develop novel vaccines and production strategies/technologies
- evaluate the immunogenicity and safety of conventional and novel vaccines
- update libraries of seed viruses and vaccine potency reagents
- evaluate the effectiveness of antivirals for complications; relative effectiveness and side-effects of M2 and NA inhibitors and feasibility of alternative models of antivirals access
- evaluate the effectiveness of community control strategies other than vaccines and antivirals.

Rationale:

With more knowledge on pandemic viruses, vaccines, antivirals and other control measures, it will be possible to design more appropriate intervention strategies, and governments will be encouraged to commit resources.

II. Strengthen Virological and Epidemiological Surveillance Nationally and Internationally

Priority 1.

Enhance and integrate virologic and disease surveillance

Required key actions:

- evaluate the activities/physical facilities of the National Influenza Centres (NICs)
- develop standardized methods and training for laboratory and disease surveillance (develop reagents/manuals, provide training and proficiency testing)
- encourage integrated surveillance based on clinical and virological data
- facilitate shipment of influenza isolates/specimens
- encourage NICs to collect additional data (e.g., influenza-related hospitalization, use of emergency services, and mortality) in different age groups
- incorporate antiviral resistance monitoring.

Rationale:

The WHO influenza surveillance network must be utilized more effectively in order to improve global influenza surveillance.

Priority 2

Expand virologic and disease surveillance

Required key actions:

- identify gaps in geographical coverage of the WHO global surveillance network and explore the use of polio and other networks to expand surveillance coverage
- investigate and integrate into the WHO surveillance system other sources of samples and information, including rapid tests, commercial testing and clinical trial samples
- arrange regional/global meetings to improve laboratory and disease surveillance and support interactions between “sister” laboratories.

Rationale:

Expansion of the WHO global influenza network is essential to provide comprehensive global coverage for early warning of the emergence of variants and novel strains.

Priority 3

Expand animal influenza surveillance and integrate with human influenza surveillance

Required key actions:

- expand and formalise the WHO Animal Influenza Network (AIN)
- establish close interactions between OIE (Office International des Epizooties) and WHO influenza networks
- encourage studies at the human/animal and at the domestic/wild bird interfaces and provide training to carry out studies

- develop and distribute reagents for identifying influenza viruses of all subtypes and establish the total gene pool among influenza viruses.

Rationale:

Extension of animal influenza surveillance and integration with human influenza surveillance is essential for understanding and preparing for threats to human health posed by animal influenza viruses.

Priority 4

Improve Data Management, Utilization and Exchange

Required key actions:

- encourage communication between surveillance systems and harmonization of data
- improve collation/analysis/dissemination of existing data, including an electronic bulletin board for special announcements
- facilitate and support central databases (e.g., Flunet and the LANL sequence database) for recording epidemiological, virological and genetic information, and for modeling purposes.

Rationale:

Existing surveillance must be better harmonized and data sets and information must be made more rapidly and widely available in order to maximize their usefulness.

Summary of the priorities concerning influenza surveillance:

- enhance and integrate virological and disease surveillance
- expand virological and disease surveillance
- expand animal influenza surveillance and integrate with human influenza surveillance
- improve data management, utilization and exchange.

There is a special need for support for developing countries.

III. Increase Influenza Vaccine Usage

Priority 1

Encourage assessment of disease burden and cost-effectiveness analyses

Rationale:

Required to justify vaccine programs and establish as a national priority given competing priorities.

Key actions:

Depend on antecedent activities, but considered absolutely essential to improve coverage.

Priority 2

Encourage countries to establish national policies and set immunization targets

Rationale:

Each element is an important determinant of vaccination coverage.

Key actions:

WHO regularly collate and publish policies, immunisation rates and reimbursement mechanisms.

Priority 3

Promote awareness amongst policy makers, health care providers, and the public

Rationale:

An important determinant of vaccination coverage.

Key actions:

Develop, compile and disseminate relevant information, initiate demonstration projects, provide training.

Priority 4

Encourage countries to identify and develop effective strategies for vaccine delivery

Rationale:

Important determinants of vaccination coverage.

Key actions:

Develop, compile and disseminate information, initiate demonstration projects, provide training.

Priority 5

Develop and implement methods for measurement and feedback of the progress of national and local programmes

Rationale:

Measurement and feedback are important determinants of vaccination coverage.

Key actions:

Develop and standardize approaches to assessing national vaccination rates, rates within target groups and vaccine effectiveness to close the audit loop.

Summary of the priorities concerning increasing influenza vaccine usage:

- encourage assessment of disease burden and cost-effectiveness analyses
- encourage countries to establish national policies and set immunization targets
- promote awareness amongst policy makers, health care providers, and the public
- encourage countries to identify & develop effective strategies for vaccine delivery
- develop and implement methods for the measurement and feedback of the progress of national and local programmes.

The recommendations represent a logical but not necessarily sequential progression and support one another in enhancing vaccine coverage. Each recommendation is necessary for increasing influenza vaccine usage.

IV. Increase Knowledge on Health and Economic Burden of Influenza

Priority 1

Capacity strengthening in epidemiological and statistical techniques for studies on influenza disease burden.

Rationale:

To enable studies on burden of influenza disease.

Key actions:

Initiate regional training programmes.

Develop common protocols including case definitions.

Priority 2

Evaluation of the clinical and economic burden of disease in countries where *there is no recognition of influenza or no control policies are in place*.

Rationale:

Establish the magnitude of influenza as a public health problem.

Determine the proportion of acute respiratory infections and febrile illnesses that is due to influenza, and to prioritise influenza in relation to other major infectious diseases.

Key actions:

Establish comprehensive studies in countries representative of a geographical area and socio-economic status.

Conduct additional smaller epidemiological studies for national influenza policy development.

Priority 3

Re-evaluate the clinical and economic burden of influenza in countries where *influenza control policies are in place*.

Rationale:

The need for better information to sustain and improve influenza control.

Key actions:

Encourage the evaluation of the burden of disease in different age and risk groups in relation to control policies.

Provide tools and protocols for evaluating effectiveness of current and alternative strategies for influenza control.

ANNEX 2

PATHOGENESIS, CLINICAL PICTURE OF INFLUENZA AND POSTINFLUENZAL COMPLICATIONS

1. Pathogenesis

- droplet infection
- virus attacks the upper airways
- it multiplies in epithelial cells
- incubation period lasts from 1 to 4 days (2 days on average)
- infected children and adults become the source of infection from 1 day before the occurrence of symptoms up to about 5 days after the occurrence of symptoms; very young children can become the source of infection for up to 6 days before the symptoms of the disease occur

2. Clinical picture of influenza

The clinical course of influenza is dependent on the properties of virus, patient's age, immunologic status, concomitant diseases (e.g. heart and lung diseases), renal sufficiency, immunosuppression, nutrition etc.

Symptoms appear suddenly and include:

- body temperature exceeding 38°C (not necessarily among elderly people)
- cough (a characteristic symptom among elderly people)
- pain of the muscles and/or headache

In addition, the following symptoms may occur:

- malaise
 - shivering
 - sore throat
 - hoarseness
 - rhinitis
 - expectorating sputum
 - chest pains
 - lack of appetite
 - vertigo
 - nausea and vomiting
 - diarrhoea
 - abdominal pains
 - sleepiness and drowsiness
- } most common among elderly people
- } much more common among children than adults

3. Postinfluenzal complications

Respiratory system:

- viral pneumonia and bronchitis
- secondary bacterial pneumonia caused by infections with *Staphylococcus aureus*, *Streptococcus pneumoniae* or *Haemophilus influenzae*
- bronchiolitis (especially among infants and toddlers)

Other systems:

- otitis media, which may lead to partial hearing loss or even deafness
- myocarditis and pericarditis
- myositis and myoglobinuria, which may lead to renal failure (especially among young patients infected by influenza A virus)
- meningoencephalitis
- toxic encephalopathy
- febrile seizures
- Reye syndrome (complication following the influenza caused by B viruses, less often by A viruses, which is observed among people under the age of 18, who were subject to long-term aspirin therapy)
- DIC (Disseminated Intravascular Coagulation)
- exacerbation of the existing diseases (especially respiratory tract diseases, e.g. asthma, and cardiovascular system diseases)
- septic shock syndrome (usually resulting from infection caused by influenza B virus and secondary *Staphylococcus* infection)
- higher frequency of occurrences of schizophrenia in the case of intrauterine infection during pregnancy
- epileptic disorders
- cerebrovascular diseases (subarachnoid haemorrhages)
- often increase in the number of cases of Parkinson disease
- lethargic encephalitis
- acute psychotic disorders, sometimes accompanied with aural and visual hallucinations

ANNEX 3

INFLUENZA TREATMENT AND PROPHYLAXIS

1. Conventional treatment

Influenza without complications:

- symptomatic treatment (including antipyretics, which are applied if the body temperature exceeds 38°C, antitussive agents)
- staying in bed
- NO NEED TO APPLY ANTIBIOTICS

Influenza with complications resulting from bacterial infection:

- in addition, it is necessary to apply antibiotics

2. Prophylaxis involving the application of influenza vaccines

At present there are 7 influenza vaccines registered in Poland, yet none of them is produced here. All these vaccines are inactivated, trivalent vaccines with antigenic composition which is updated every season in accordance with WHO recommendations. The vaccines contain either split virions (split vaccines) or only surface glycoproteins of influenza virus, i.e. hemagglutinin and neuraminidase (subunit vaccines).

Influenza vaccines registered in Poland

- Inactivated vaccines with split virion
 - Vaxigrip (Aventis Pasteur, F, certificate issued in 1992)
 - Fluarix (GlaxoSmithKline Biologicals, B, certificate issued in 1994)
 - Begrivac (Chiron Behring, D, certificate issued in 1997)
- Subunit vaccines containing isolated surface antigens: hemagglutinin and neuraminidase
 - Influvac (Solvay Pharmaceuticals, NL, certificate issued in 1995)
 - Fluvirin (Evans Medical, GB, certificate issued in 1998)
 - Isiflu Zonale (Istituto Sierovaccinogeno Italiano, certificate issued in 1999)
 - Agrippal (Chiron Behring, D, certificate issued in 2004).

Vaccines:

- are safe,
- do not cause serious side effects,
- their efficiency in preventing influenza incidences and postinfluenzal complications amounts to 70-90% among unaffected people under the age of 65 and 30-70% among elderly people and children

3. Treatment and prophylaxis with application of antivirals:

Available antivirals:

- amantadine and rimantadine – effective only in the case of infections caused by influenza A viruses
- oseltamivir and zanamivir – effective in the case of infections caused by influenza **A and B** viruses.

In the process of treatment of influenza the following can be applied:

- amantadine (in the form of tablets and sirup) – to be applied in patients of 1 year and older
- rimantadine (in the form of tablets and sirup) – to be applied in patients of 13 years and older
- oseltamivir (in the form of fluid for children; also in the form of dragées and powder) – to be applied in patients of 1 year and older
- zanamivir (in the form of powder for oral inhalation) – to be applied in patients of 7 years and older

In the influenza prophylaxis the following can be applied:

- amantadine (in the form of tablets and sirup) – to be applied in patients of 1 year and older
- rimantadine (in the form of tablets and sirup) – to be applied in patients of 1 year and older
- oseltamivir (in the form of fluid for children; also in the form of dragées and powder) – to be applied in patients of 13 years and older

Effects of applying the above antivirals

- in the case of treatment:
 - reducing the duration of disease
 - milder course of disease
 - reducing the period when the virus is disseminated by the infected person, which limits the spread of infection
 - antivirals do not suppress the immunologic response to influenza vaccination and infection
- in the case of prophylaxis:
 - amantadine and rimantadine are effective in preventing influenza incidences caused by A virus (effectiveness: 70%-90%)
 - oseltamivir is effective in preventing influenza incidences caused by A and B viruses (effectiveness: about 82%-92%)

Amantadine and rimantadine - drawbacks:

- effective only in the case of influenza caused by A viruses
- in the case of treatment, it is necessary to apply them as soon as possible after the symptoms of disease occurred; it is best to apply them within 48 hours following the occurrence of the symptoms
- adverse reaction to central nervous system (they cause e.g. insomnia, nervousness, anxiety, troubles with concentration, vertigo and headaches, convulsions)
- adverse reaction to digestive system (they cause e.g. nausea, lack of appetite, constipation)

- selection of strains resistant to these medications; such strains show stability, spread and cause infections among people who have contact with those who take amantadine and rimantadine; the resistance is of cross character
- they do not provide protection against postinfluenzal complications

Oseltamivir and zanamivir – drawbacks:

- in the case of treatment, it is necessary to apply them as soon as possible after the symptoms of disease occurred; it is best to apply them within 48 hours following the occurrence of the symptoms
- in the case of zanamivir, the medication has a rather inconvenient form requiring the application of inhaler, which is a problem for many people, especially the elderly

ANNEX 4

GUIDELINES FOR THE VOIVODSHIP SANITARY-EPIDEMIOLOGICAL STATIONS (VSESS) CONCERNING VIROLOGICAL INFLUENZA SURVEILLANCE

In the virological surveillance there should participate all Voivodship Sanitary-Epidemiological Stations. They are obliged to:

1. conduct isolation of influenza viruses' strains as well as other virological diagnostics (immunofluorescence, RT-PCR) of the materials taken from the patients with influenza/influenza-like symptoms and provided by selected health-care institutions, including outpatient clinics and clinics, as well as selected physicians participating in influenza surveillance (including *SENTINEL* system),
2. forward immediately the isolated influenza virus' strains to the National Influenza Center,
3. send information on materials taken from patients, including the results of virological tests, the National Influenza Center in weekly reports ,
4. conduct serological diagnostics on influenza infections,
5. perform sero-surveys on influenza in serum samples taken from the following age groups: 0-3, 4-7, 8-14, 15-25, 26-44, 45-64 and ≥ 65 years of age.

VSESS' participation in virological influenza surveillance requires:

1. establishing cooperation with selected physicians in outpatient clinics and hospitals and particularly with general practitioners, who are to take samples for influenza viruses' isolation as well as for immunofluorescence (IF) and other diagnostic tests and methods,
2. organising, on VSESS' own, training courses for selected physicians and nurses concerning taking, storing and transporting materials for influenza testing,
3. providing VSESS with necessary laboratory equipment, including:
 - biological safety cabinets of II class¹,
 - two-chamber CO₂ water-jacketed incubators²,
 - microscopes with fluorescence device³,
 - culture microscopes⁴,
 - incubators for +37°C and +35°C with cooling⁵
 - refrigerator-freezers⁶
 - low-temperature freezers -86°C⁷,
 - vessels for storing samples in liquid nitrogen⁸

¹ essential for fulfilling primary standards of laboratory work, including work with contagious material; serves to ensure necessary laboratory cleanliness in maintaining tissue cultures, isolating influenza virus on chick embryos and tissue cultures, performing serological tests, operating on a potentially

contagious material taken from a patient and many other, as well as ensures safe working conditions for the staff, protecting it from possible infections.

- ² essential in working on cell cultures, including isolating and multiplying influenza virus; two-chamber incubators are necessary for cultures requiring different incubation temperature (non-infected versus infected culture).
- ³ essential for observing preparations analysed with immunofluorescence method.
- ⁴ essential for observing cell cultures.
- ⁵ essential for incubating chick embryos, which serve to multiply and isolate influenza viruses as well as for performing immunofluorescence test.
- ⁶ essential for storing reagents and tests.
- ⁷ essential for storing materials taken from the patients and influenza viruses.
- ⁸ essential for storing cell cultures on low levels of passage.

ANNEX 5

GUIDELINES FOR THE NATIONAL INFLUENZA CENTER IN RELATION TO THE VOIVODSHIP SANITARY-EPIDEMIOLOGICAL STATIONS (VSESS)

Incorporating all VSESSs into virological influenza surveillance requires from the National Influenza Center following actions:

1. organising training courses on taking, storing and transporting materials for influenza testing for VSESSs' employees
2. organising training courses on methods of influenza virus isolation in 8 and 11 days old chick embryos and in MDCK cell cultures, as well as training courses on other virological diagnostic methods (IF and other) and on serological tests for VSESSs' employees
3. preparing detailed information (procedures) and instructions on taking, storing and transporting materials for influenza testing for VSESSs
4. preparing detailed information (procedures and instructions) on methodology of conducting influenza virus isolation and carrying out IF and other diagnostic tests, as well as serological tests for VSESSs
5. organising and maintaining efficient information exchange between VSESSs and the National Influenza Center.

ANNEX 6

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