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National Preparedness Plan for an Influenza Pandemic

MINISTRY OF SOCIAL AFFAIRS AND HEALTH
Helsinki, Finland 2007

SUMMARY

National preparedness plan for an influenza pandemic. Helsinki 2007. 191 pp. (Publications of the Ministry of Social Affairs and Health, ISSN 1236-2050, 2007:10)
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In the face of an increasing threat of an influenza pandemic, WHO has repeatedly urged its member countries to update their pandemic preparedness plans, and published strategic and technical instructions and recommendations for their guidance. Preparedness for a flu pandemic has recently been discussed on a number of occasions in the various organs of the European Council.

The Ministry of Social Affairs and Health set up a Working Group on National Pandemic Preparedness on 21 April 2005, whose remit was to draw up a national pandemic preparedness plan. Its objective is to confine the harmful effects of a potential influenza pandemic on the population's health and to secure the best possible continuity of the society's functions. On the basis of the proposal, the Ministry of Social Affairs and Health has compiled a national preparedness plan for an influenza pandemic. This preparedness plan has been accepted in the Ministry of Social Affairs and Health management group and in the Government Meetings of the Heads of Preparedness.

The purpose of the preparedness plan is to set up guidelines for flu pandemic preparedness at all administrative levels of healthcare and to support preparations in other administrative sectors.

The preparedness plan paints a picture applicable to Finnish conditions of development of a pandemic, its health, societal and economic impact, available means of its prevention, special ethical questions, areas of responsibility and special arrangements of healthcare organisations, material requirements of preparedness, needs for collaboration between different administrative sectors and special characteristics of organisation during a pandemic, as well as communication and provision of information. The preparedness plan examines a pandemic from a wide perspective, creating a foundation for detailed plans of all administrative sectors. For practical reasons, this preparedness plan includes only brief outlines of plans other than that of the Ministry of Social Affairs and Health administrative sector. A prerequisite of effective implementation is integration of the plans of different administrative sectors.

Management relations during a pandemic are determined in accordance with the Government model for Government civilian crisis management.

At the municipal level, the organ responsible for prevention of communicable diseases plays a central role in pandemic preparedness and during a pandemic. The hospital district physicians responsible for communicable diseases act as experts in planning at the regional and local levels.

A preparedness plan must change with changes in perceived threat, the operating environment and methods of prediction and prevention. For this reason, a preparedness plan is never 'finished', and it will be updated as essential changes occur in the pandemic situation. An influenza pandemic may be set into motion soon or it may take years, and the virus that will cause it is not necessarily a current influenza virus subtype. Being prepared for a flu pandemic simultaneously significantly reinforces Finland's preparedness to repel any other widespread, transnational or global epidemic. The set structures for repelling infectious diseases reinforced by preparedness support important areas of continuous protection against infectious diseases, and thus promote health of the population. Preparedness supports safeguarding of vital functions of society.

Key words: preventive healthcare, quarantine, infectious diseases, inoculation, protection, preparedness, influenza

TIIVISTELMÄ

Kansallinen varautumissuunnitelma influenssapandemiaa varten. Helsinki 2007. 191 s. (Sosiaali- ja terveysministeriön julkaisuja, ISSN 1236-2050, 2007:10)
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Influenssapandemian uhkan lisääntyessä WHO on kehottanut jäsenmaita päivittämään pandemiaan varautumisen suunnitelmiaan sekä julkaissut tätä ohjaavia strategisia ja teknisiä ohjeistoja ja suosituksia. Influenssapandemiaan varautumista on käsitelty Euroopan unionin komission kokouksissa useasti viime aikoina.

Sosiaali- ja terveysministeriö asetti 21.4.2005 kansallisen pandemiavarautumisen työryhmän, jonka tehtävänä oli laatia ehdotus influenssapandemiaan varautumisen kansalliseksi suunnitelmaksi. Sen tavoitteena on mahdollisen pandemian väestön terveydelle aiheuttamien haittojen rajoittaminen sekä yhteiskunnan toimintojen jatkuvuuden mahdollisimman hyvä turvaaminen. Ehdotuksen pohjalta sosiaali- ja terveysministeriö on laatinut valtakunnallisen varautumissuunnitelman influenssapandemian varalle. Tämä varautumissuunnitelma on hyväksytty soiaali- ja terveysministeriön johtoryhmässä ja valtioneuvoston valmiuspäällikkökokouksessa

Varautumissuunnitelman tarkoitus on ohjata varautumista influenssapandemiaan terveydenhuollon kaikilla hallinnon tasoilla sekä tukea valmistautumista muilla hallinnon aloilla.

Varautumissuunnitelmassa annetaan Suomen oloihin soveltuva kuva pandemian kehittymisestä, terveydellisistä, yhteiskunnallisista ja taloudellisista vaikutuksista, torjuntaan käytettävissä olevista keinoista, eettisistä erityiskysymyksistä, terveydenhuollon organisaatioiden vastuualueista ja erityisjärjestelyistä, varautumisen materiaalisista tarpeista, eri hallinnon alojen välisen yhteistyön tarpeista ja pandemian aikaisen organisaation erityispiirteistä, sekä viestinnästä ja tiedottamisesta. Varautumissuunnitelma tarkastelee pandemiaa laaja-alaisesti luoden pohjan kaikkien hallinnon alojen yksityiskohtaisille suunnitelmille. Käytännön syistä tässä valmiussuunnitelmassa on esitetty vain lyhyesti muiden kuin sosiaali- ja terveysministeriön hallinnonalan suunnitelmat. Tehokas toimeenpano edellyttää laajempaa eri hallinnonalojen suunnitelmien integroimista toisiinsa.

Johtosuhteet pandemiatilanteessa määräytyvät valtion siviilikriisin johtamismallin periaatteiden mukaisesti.

Kuntatasolla kunnan tartuntatautien torjunnasta vastaava toimielin on keskeisessä asemassa pandemiaan varautumisessa ja pandemiatilanteessa. Sairaanhoitopiirien tartuntataudeista vastaavat lääkärit toimivat alueellisen ja paikallisen suunnittelun asiantuntijoina.

Varautumissuunnitelman tulee muuttua uhkakuvan, toimintaympäristön sekä ennustamis- ja torjuntakeinojen muuttuessa. Tästä syystä varautumissuunnitelma ei ole koskaan ”valmis”, vaan sitä päivitetään sitä mukaa kun oleellisia muutoksia tilanteessa tapahtuu. Influenssapandemia saattaa käynnistyä pian tai viedä vuosia, eikä sen aiheuttava virus ole välttämättä ajankohtainen influenssaviruksen alatyyppi.

Influenssapandemiaan varautuminen tehostaa samalla olennaisesti Suomen valmiutta torjua mitä tahansa laajaa, kansainvälistä tai globaalia epidemiaa. Valmistautumisen tehostamat tartuntatautien torjunnan rakenteet tukevat keskeisiä jatkuvan tartuntatautien torjunnan alueita ja edistävät näin väestön terveyttä. Varautuminen tukee yhteiskunnan elintärkeiden toimintojen turvaamista.

Asiasanat: ehkäisevä terveydenhuolto, karanteeni, tartuntataudit, rokotus, suojaus, valmius, influenssa

SAMMANDRAG

Nationell beredskapsplan för en influensapandemi. Helsingfors 2007. 191 s. (Social- och hälsovårdsministeriets publikationer, ISSN 1236-2050, 2007:10)
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I och med att hotet om en influensapandemi ökat har WHO upprepade gånger uppmanat medlemsländerna att uppdatera sina beredskapsplaner för pandemier samt publicerat riktgivande strategiska och tekniska anvisningar och rekommendationer för detta. Beredskapen för en influensapandemi har behandlats flera gånger i Europeiska unionens olika rådskonstellationer under den senaste tiden.

Social- och hälsovårdsministeriet tillsatte den 21 april 2005 en arbetsgrupp för nationell pande-miberedskap som fick i uppdrag att utarbeta en nationell beredskapsplan för en influensapandemi. Syftet med planen är att begränsa de skador som en eventuell pandemi orsakar befolkningens hälsa samt att så väl som möjligt trygga kontinuiteten i samhällsfunktionerna.

På basis av förslaget har social- och hälsoministeriet utarbetat ett nationell beredskapsplan för en influensapandemi. Denna beredskapsplan har behandlats i social- och hälsovårdsministeriets ledningsgrupp och statsrådets beredningschefsmöte.

Syftet med beredskapsplanen är att styra beredskapen för en influensapandemi på alla förvalt-ningsnivåer inom hälso- och sjukvården samt att stödja beredskapen inom andra förvaltningsområden. I beredskapsplanen ges en till finländska förhållanden anpassad bild av en pandemis utveckling, dess hälsomässiga, samhälleliga och ekonomiska verkningar, tillgängliga bekämpningsmetoder, etiska specialfrågor, hälso- och sjukvårdsorganisationernas ansvarsområden och specialarrangemang, de materiella beredskapsbehoven, behovet av samarbete mellan olika förvaltningsområden och särdragen hos organisationen under en pandemi, samt av kommunikationen och informationen. Beredskapsplanen granskar pandemier på ett övergripande sätt och skapar en grund för alla förvaltningsområdens detaljerade planer. Av praktiska skäl presenteras andra förvaltningsområdens planer än social- och hälsovårdsministeriets förvaltningsområdes plan endast i korthet i denna beredskapsplan. Ett effektivt verkställande förutsätter en mera omfattande integration av de olika förvaltningsområdenas planer.

Beredskapsplanen bör ändras när hotbilden, omvärlden samt prognos- och bekämpningsmetoder-na förändras. Av denna orsak blir beredskapsplanen aldrig ”färdig” och därför skall man uppdatera den allteftersom väsentliga förändringar förekommer i pandemisituationen . En influensapandemi kan starta snart eller ta flera år, och det virus som orsakar den behöver inte nödvändigtvis vara den aktuella undertypen av influensavirus.

Beredskapen för en influensapandemi effektiverar samtidigt betydligt Finlands beredskap att bekämpa vilken som helst omfattande, internationell eller global epidemi. Förberedelserna effektiverar strukturerna för bekämpningen av smittsamma sjukdomar och detta stödjer områden som är centrala med tanke på den fortlöpande bekämpningen av smittsamma sjukdomar och främjar på så sätt befolkningens hälsa. Beredskapen stödjer säkrandet av livsviktiga samhällsfunktioner.

Nyckelord: förebyggande hälsovård, karantän, smittsamma sjukdomar, vaccination, skydd, beredskap, influenza

CONTENTS

1 SUMMARY

The Ministry of Social Affairs and Health established a National Working Group for Pandemic Preparedness on April 21 2005, with a remit to prepare a national preparedness plan for pandemic influenza. Its aim is to limit the harm a pandemic could cause to the health of the population and to ensure continuous functioning of society as far as possible. Based on this proposal, the Ministry of Social Affairs and Health has prepared a national preparedness plan for an influenza pandemic. The Ministry of Social Affairs and Health Steering Group and the Government Meeting of the Heads of Preparedness have approved the plan.

The national plan contains a summary of its management and powers, background information and methods of monitoring influenza and influenza pandemics, and an assessment of the possibilities of reducing the damage caused by a pandemic. The document identifies the organisations in charge of the preparedness for an influenza pandemic in Finland, as well as the objectives and guidelines for the operation of the healthcare services in the different phases leading to a pandemic. The document includes ethical considerations on the allocation of limited resources, considers communications and dissemination of information, and provides technical guidelines to healthcare professionals. The current status of influenza pandemic preparedness of other administrative sectors is briefly outlined in the plan. In addition, the document proposes revisions in legislation, as well as other measures and additional resources that are required for the implementation of the plan and for maintaining preparedness.

Influenza pandemic

Influenza is a respiratory tract infection characterised by sudden onset and caused by influenza virus types A and B, which cause annual epidemics around the globe. During these epidemics, 5 to 15% of the population acquires the infection. In Finland, additional mortality caused by annual epidemics ranges from hundreds to over one thousand during severe epidemics. Influenza epidemics cause a considerable strain on the healthcare services and at worst can disrupt school and work activities over a period of several weeks. The impact of the annual epidemics can be limited by vaccination in autumn, before the epidemic season. These vaccinations are free of charge for individuals belonging to groups at risk of severe complications after an influenza infection.

An influenza pandemic is an epidemic of an influenza A virus subtype novel to the human population and spreading rapidly around the world. Morbidity during a pandemic can rise to 25 – 35% of the population, significantly higher than during the annual epidemics, and the average clinical description may be more severe than that of normal seasonal influenza. Unlike with seasonal influenza, serious illness may develop also in otherwise healthy, young individuals.

Wild waterfowl harbour a large variety of influenza A virus subtypes that have not been found in humans during the last century and which could potentially cause a pandemic. Avian viruses, however, are poorly transmissible to humans. The virus causing the next pandemic cannot be predicted, nor when it will emerge. The continuously geographically spreading avian influenza epidemic caused by the A/H5N1 virus that emerged in Asia at the end of 2003 has increased the risk of a pandemic to a considerably higher level than seen during the past 30 years. Disease clusters and epidemics in poultry caused by the A/H5N1 virus have spread from Asia to Europe, the Middle East and Africa. WHO on its website

monitors the number of human infections worldwide. Of those who have contracted the disease between 2003 and 2006, on average 60% have died. With almost no exceptions, these individuals have contracted the infection through handling virus-infected, sick or dead birds, or otherwise through close contact with diseased poultry.

According to the WHO 6-phase analysis of the development of an influenza pandemic, the situation has now reached pandemic alert phase 3. If this A/H5N1 virus, currently posing the greatest pandemic threat, acquires the ability to spread between humans, it will cause small (phase 4) or large (phase 5) disease clusters in humans before the onset of a pandemic (phase 6).

Alleviating the damage caused by a pandemic

It is impossible to predict the severity of the next pandemic. However, certain basic assumptions concerning the impact of a pandemic are required in order to establish a pandemic preparedness plan. For the current Finnish pandemic preparedness plan, it is assumed that during a first pandemic wave of about 8 weeks' duration, 35% of Finland's population of 5.2 million may fall ill with influenza, of whom 11,000 to 36,000 may require hospital treatment, and 3,500 to 9,000 may die. Such an impact is considerably more severe than the one observed during the Asian influenza pandemic (1957) or during the Hong Kong influenza pandemic (1968), but it would be substantially less than the impact of the Spanish Flu pandemic (1918).

If the morbidity associated with the pandemic is high and the average clinical description clearly more severe than seen during annual epidemics, the impact on society may be wide-ranging and substantial. Absences from work may cause disruption in key sectors of society, essential for the wellbeing of the population. Rumours and fear may lead to damaging over-reactions by individuals and subgroups in the population. Disturbances lasting several weeks or months in all segments of society may cause significant economic loss, both at national and international level.

Minimising the impact of a pandemic requires close cooperation between administrative sectors and may require fast-track decision-making procedures. For the scenario of a significant fraction of the workforce falling ill within a two-month pandemic wave, a key component in developing pandemic preparedness is defining clear mandates regarding responsibilities at the national level and a detailed action plan for all administrative sectors, in addition to advance procurement of materials. This is a particular challenge for the healthcare services, where a greatly increased workload needs to be addressed while much of the staff will be on sick leave and there is a shortage of hospital beds. The progress of the pandemic may be slowed, with a consequent fall in the peak burden on healthcare services, by measures that slow down the transmission of the virus in the population. These measures include good hand hygiene, appropriate coughing and sneezing practices, and encouraging infected persons to stay at home. Closing of daycare centres and schools may be considered, and non-essential mass gatherings may be prohibited.

The most effective measure to reduce the impact of a pandemic would be immunisation with a vaccine made from the pandemic virus. The production of such a specific vaccine, however, can only begin after WHO has declared the beginning of a pandemic. Since the vaccine manufacturing process takes several months, it is unlikely that such a targeted pandemic vaccine will be available during the first wave of the pandemic. During past pan-

demics, several consecutive waves have been observed. Thus, the availability of a specific pandemic vaccine would be important during a second or subsequent wave of the pandemic. Once a pandemic emerges, the global demand for a pandemic vaccine will be much higher than production capacity can meet. For this reason, Finland has signed a contract with a Dutch vaccine manufacturer, according to which an annual fee ensures a privileged slot in the line of vaccine orders. In addition, Finland has placed an order for prototype vaccine. In manufacturing the prototype vaccine, the H5N1 influenza virus isolated from birds and known to have caused the disease in humans is used. Negotiations have taken place on a shared vaccine manufacturing facility for the Nordic countries.

Early treatment of influenza patients with specific antiviral drugs may significantly alleviate the illness caused by the pandemic virus and thus reduce the impact a pandemic can cause for the society. For the event of a pandemic, Finland has acquired 1.3 million treatment courses of the antiviral oseltamivir (Tamiflu). In addition, quantities of amantadine (Atarin) and zanamivir (Relenza) have been obtained for more limited use. Other equipment, such as respirator masks, have also been purchased.

Operation of the healthcare services during a pandemic

The healthcare services are under the greatest stress during a pandemic, and on the other hand, the impact of the pandemic on the rest of society is largely dependent on its successful functioning. The present preparedness plan addresses a wide range of activities of the healthcare services to minimise damage from a pandemic threat and a pandemic. It presents the principles of detection of influenza cases and epidemics, as well as evaluation and treatment of patients. The plan contains guidelines for exceptional division of functions between primary healthcare and specialist treatment facilities and patient placement, and outlines the responsibilities of different organisations in the healthcare services and their cooperation. Among others, the plan contains guidelines for personal protective equipment in healthcare settings. These measures also require the procurement of a variety of supplies in Hospital Districts and municipalities.

During the pandemic alert period, the virus may spread from person to person in local clusters or epidemics. If human-to-human transmission has not yet been identified in Finland during this stage, the main objective of the healthcare services is to swiftly identify infected persons entering the country, isolate them and initiate treatment in order to prevent further transmission of the infection. Once the pandemic has started, the main objective is to slow the speed of its spread and to care for the patients.

The justification of planned actions and the fair allocation of limited prophylactic and treatment measures require careful ethical consideration of these issues (see section 9). Although Finland intends to purchase one dose each of the two different vaccines for every inhabitant, these vaccines may arrive in different shipments. Consequently, decisions may have to be made as to which population groups should be vaccinated first. Likewise, the limited availability of oseltamivir does not allow for its use in all proven indications. The primary value of pandemic preparedness is saving years of life. On the other hand, protecting healthcare staff treating infectious disease patients is important, both because of their increased risk of exposure and the specific burden caused by the situation on healthcare services. The priority order of protecting other population groups will be determined by the properties of the pandemic virus. Such information only becomes available when the pandemic is already under way.

With a perceived decline in threat from infectious diseases during 1970-1990s, preparedness to address such threats was not developed. Thus, the organisations to combat unexpected infectious disease threats and the resources required to address such threats have remained scarce. Reducing significantly the impact of a pandemic can only be achieved if resources for the surveillance and control of infectious diseases are permanently increased at both national and regional levels.

Under exceptional conditions, operation of the healthcare services can only be successful if healthcare staff, the public and society at large are well informed about preparedness plans before the onset of a pandemic, and about possible revisions of plans once the pandemic has reached the country. This needs to be incorporated also in resource allocation for communications at national and local levels.

Securing the vital functions of society

The national government has defined in a decision of principle the vital functions of society that need to be secured under all circumstances. These include state governance, state function as an international body, military defence, internal security, maintaining the functionality of the economy and society, securing the livelihood of the population and its ability to function and to cope with the crisis.

An influenza pandemic can present a threat to almost all vital functions of society. The National Working Group for Pandemic Preparedness has requested each of the ministries to identify functions in their domains that need to be secured. Besides social welfare and healthcare, such critical services include management systems, energy supply, food supply, essential transports, financial and insurance operations, as well as the means for traffic and communications. Severe disruptions in any of these services threaten the functions of society.

During a pandemic, the greatest burden will fall on the healthcare services, but securing other vital government functions will also present a major challenge. The present plan contains detailed guidelines for preparedness in the healthcare services, and also provides the core information from which other sectors can update their pandemic preparedness plans.

Governance and competent authorities in a pandemic situation

Leadership relations in a pandemic situation are determined in accordance with the principles set out in the Government civil crisis management model. Management of civil crises is based on the Constitution of Finland, the Government Act, the Government Code of Practice, and other legislation concerning the authorities, particularly the Communicable Diseases Act. The Cabinet discusses coordination of the functions of the administrative sectors and prepares issues for decision by the Council of State. Operative management is the responsibility of the statutory competent Ministry, which in a pandemic situation is the Ministry of Social Affairs and Health. Government level governance is based on the duties of the Prime Minister under section 66 of the Constitution of Finland. Under section 10 of the Government Code of Practice, the Meeting of the Ministries' Permanent Secretaries is the cooperative organ supporting the work of the Government and the Prime Minister. The Government Meeting of the Heads of Preparedness supports the Meeting of the Ministries' Permanent Secretaries.

When WHO declares that the pandemic alert has reached phase 4 or at the latest when it progresses to phase 5, i.e. the virus is increasingly transmitted between humans, the Ministry of Social Affairs and Health establishes a Pandemic Coordination Group to support its governance of healthcare services. The Coordination Group undertakes the tasks not covered by the Government Meeting of the Heads of Preparedness.

The State Provincial Office coordinates preparedness for emergency conditions as defined in the Emergency Powers Act by organising the stipulated concerted actions within the province (7.4.2000/348). The State Provincial Office is led by the Governor. The Social and Health Department of each State Provincial Office ensures that the expertise of the Hospital Districts is utilised in drawing up regional preparedness plans, and that their plans and those of the local authorities are coordinated into a functional whole, in accordance with the Ministry of Social Affairs and Health guidelines. Leadership by the State Provincial Office directed at the local authorities in a pandemic situation takes place through the coordination, issuing of guidelines and surveillance of legality outlined above.

The Communicable Diseases Act defines the competent authorities in a pandemic situation. Under it, the powers demanded by the situation rest with the Government, Ministry of Social Affairs and Health, State Provincial Office, the local authority organ responsible for infectious diseases, and the National Public Health Institute.

The Communicable Diseases Act also assigns obligations to the Hospital District, the medical practitioner responsible for infectious diseases in the local authority, the doctor treating a patient infected by a generally dangerous or notifiable infectious disease, and the National Authority for Medicolegal Affairs.

On municipal level, the agency responsible for prevention of infectious diseases takes a central role in pandemic preparedness and a pandemic situation. Close collaboration between the leader of the local authority and the senior doctor of each health centre is necessary for good management. However, the competent authorities and decision-making remain unchanged.

Communications are a part of governance. The party responsible for governance is also in charge of communications.

Execution of preparedness plan and further planning measures

All Ministries must ensure that preparedness plans within their sector are regularly updated at local, regional, and national level, and that the resource, legislative and other prerequisites are ensured for the necessary measures to increase preparedness. At least once a year, each Ministry makes an assessment to ensure that the national pandemic preparedness plan is up-to-date regarding the mandate of the ministry, and makes the necessary revisions. Prime Minister's Office coordinates the preparedness plans of all sectors. The Government Meeting of the Heads of Preparedness and the Meeting of the Ministries' Permanent Secretaries support the Prime Minister's Office.

The Ministry of Justice has drafted the revised Emergency Powers Act. The draft Act defines as a state of emergency a very widely spread dangerous infectious disease equivalent to an especially serious disaster.

The Ministry of Social Affairs and Health has drafted the necessary amendments to the Communicable Diseases Act and Decree required in order to enhance protection against a pandemic, as well as those of the Primary Health Care Act and the Act on Specialised Medical Care.

Finland participates in the planning process on possible setting up of pan-Nordic vaccine production. The National Public Health Institute prepares the plans on vaccination of the population.

The Ministry of Social Affairs and Health, National Public Health Institute, Finnish Institute for Occupational Health, National Agency for Medicines and National Emergency Supply Agency assess the necessary additional reserve stocks of respirator masks and other healthcare equipment, in cooperation with Hospital Districts.

The National Agency for Medicines makes contingency plans for distribution, release for consumption, delivery to patients and surveillance of consumption of antiviral drugs held in reserve stocks.

Hospital District, health centre and other healthcare services employers must organise provision of information and training on occupational health and safety in accordance with occupational health and safety regulations, and ensure that sufficient quantities of protective equipment are available in healthcare units.

The Ministry of Education and the Ministry of Social Affairs and Health will jointly prepare a plan of training for employees recruited from other duties and involved in outpatient and nursing care of influenza patients, and for noting risks from infectious diseases, such as those of a pandemic, in basic training.

The National Public Health Institute will maintain online guidelines related to surveillance of the influenza situation, detection of cases, and pandemic protection and control of healthcare employees and the public.

The Ministries will ensure that they have the resources for communications concerning the pandemic within their own administrative area. Information, instructions and recommendations contained on the websites will be continually updated and the loading capacity of online services tested. The Ministries will step up their training and use of the VIRVE telephone network. Each administrative sector makes a plan for enhanced communications and prepares relevant material in advance.

International cooperation

The World Health Organization (WHO)

WHO has a central role in surveillance of infectious diseases. It defines the point of transition from one pandemic phase to the next and issues recommendations on necessary action. The revised International Health Regulations reinforce worldwide prevention of infectious diseases. About 120 national influenza centres from more than 80 countries, including Finland, participate in WHO international influenza surveillance. One of the most important tasks of the WHO influenza laboratory network is detection of novel, uncommon influenza viruses, which in a worst case scenario may develop into causes of a pandemic.

The European Union (EU)

The European Union has developed a surveillance and prevention system of infectious diseases since the 1990s. At the EU Commission, the work is concentrated under DG SANCO, the Directorate General for Health and Consumer Affairs. The European Centre for Disease

Prevention and Control (ECDC), established in 2005, is an expert agency with scientific know-how to improve prevention and control of infectious diseases within the EU. The EU cooperation, carried out within the Council, Commission and ECDC working groups and committees, improves the preparedness and compatibility of member countries' pandemic plans. Preparedness for a flu pandemic is the responsibility of each individual member country. The member countries of the Union are legally obliged to participate in the operation of the Early Warning Response System of communicable diseases. Through the infectious diseases surveillance and monitoring network, the Commission, member countries and the European Centre for Disease Prevention and Control obtain up-to-date information on epidemic outbreaks within the EU zone.

Nordic cooperation

The Nordic countries signed the Nordic Public Health Preparedness Agreement in 2002. The Agreement commits the Nordic countries to mutual social and healthcare cooperation in crisis and catastrophic situations, taking into account national needs. A widespread influenza pandemic constitutes a crisis situation as defined in the Agreement.

The agenda of Finland's presidency of the Nordic Council of Ministers in 2007 includes active promotion of Nordic cooperation in issues related to vaccines and a possible pandemic. Investigations are currently under way on the possible initiation of joint Nordic influenza vaccine production.

2 INTRODUCTION

During the 20th century, influenza viruses caused three global epidemics or pandemics, in 1918, 1957, and 1968. They had a significant impact on public health, and substantial economic, societal and political consequences. Based on increasing knowledge about influenza viruses and pandemics accumulated recently, it is likely that mankind will sooner or later face another influenza pandemic.

During recent decades, the World Health Organization (WHO) has established a wide network of reference laboratories for the global surveillance of influenza. WHO has consistently communicated on the threat of a pandemic and encouraged member states to prepare for such an event. Many member states have developed a preparedness plan, but until recently, measures to improve preparedness have been very restricted in many countries and did not cover all functions that may be affected by a pandemic, and need to be covered by a pandemic preparedness plan. With a perceived decline in threat from infectious diseases during 1970-1990s, preparedness to address such threats was not developed. This misconception was rooted in the successful elimination of threats presented by certain infectious agents. Therefore, preparing for extensive infectious disease epidemics has not been considered important.

The international anthrax threat in 2001, the international SARS epidemic in 2003, and a survey carried out in 2004 by the Ministry for Social Affairs and Health have indicated that preparedness for biological threats, i.e. large epidemics of infectious diseases or pandemics, is inadequate in Finland.

With the increased pandemic threat, WHO, the European Commission, and the European Centre for Disease Prevention and Control (ECDC), set up in spring 2005, have repeatedly encouraged member states to update their preparedness plans and published strategic guidelines and technical recommendations. Recently, preparedness for an influenza pandemic has been repeatedly discussed by the European Council.

On 21 April 2005, The Ministry of Social Affairs and Health nominated a National Working Group for Pandemic Preparedness, with the following duties: (1) to prepare a national plan for pandemic preparedness; (2) to establish guidelines for preparedness in the healthcare services; (3) to ensure efficient cooperation between different administrative sectors. The Working Group consisted of representatives of the Ministry of Social Affairs and Health administrative sectors from the National Public Health Institute, the National Agency for Medicines, the State Provincial Office, Hospital Districts, primary health care, the Association of Finnish Local and Regional Authorities, and civic organizations, as well as the Ministry of Agriculture and Forestry, the Ministry of the Interior, the Ministry of Foreign Affairs, and the Ministry of Defence. The Working Group reported to Liisa Hyssälä, Minister of Health and Social Services, on 15 March 2006. After circulation of the proposal for comments, the plan has been updated at the Ministry of Social Affairs and Health.

In addition to the National Working Group for Pandemic Preparedness, many other ministries and departments have implemented measures to improve pandemic preparedness.

Research and modelling work related to influenza viruses, epidemiology, medicines, vaccines and measures to limit its spread is under way in Europe and elsewhere in the world, and producing new insights. Preparing for the next influenza pandemic is a continuous process.

3 PURPOSE OF THE PREPAREDNESS PLAN

The aim of this preparedness plan is to provide guidance to all levels of the healthcare services for pandemic preparedness, and to support activities of all other administrative sectors.

Adapted to the specific Finnish context, this preparedness plan presents a possible scenario for the development of a pandemic, its impact on health, society, and economy. Furthermore, it addresses measures that are available to reduce the impact of a pandemic, ethical issues specific to a pandemic situation, the areas of responsibility and exceptional arrangements for healthcare organisations. The plan identifies the needs of procurement of materials for improving preparedness, the need for cooperation between the different administrative sectors, requirements for exceptional organisational arrangements during the event of a pandemic, and needs of communications. The plan addresses a wide range of issues related to a pandemic, thus providing the basis to other administrative sectors when preparing their detailed pandemic preparedness plans. For practical reasons, plans of administrative sectors other than social affairs and health are presented only briefly in this document. Efficient implementation requires integration of plans prepared by the different administrative sectors.

The preparedness plan needs to be continuously adapted to change in threats and functional environment, change in possibilities to predict further developments, or when control measures become available. For this reason, the preparedness plan will never be "ready". An influenza pandemic can emerge at any time, within months or within years. It can be caused by a virus currently presenting a pandemic threat or by any other influenza A virus subtype. Preparing for an influenza pandemic concomitantly enhances Finland's ability to cope successfully with any other large international or global epidemic. Strengthening structures for combating pandemics at the same time improves core areas of infectious disease control and enhances public health. Preparedness supports securing the vital functions of society.

Primary responsibility in the preparedness of healthcare services rests, apart from the municipalities, in the regional organisation, in which Hospital Districts and the Provincial Offices jointly guide the planning and implementation for preparedness in public primary healthcare, social services and private healthcare services. The function of the regional organisation is to create a regionally adapted organisation and command structure, and a plan that incorporates regional and local characteristics.

A key objective of the plan is to ensure equal services to the population in different areas of the country even in the exceptional conditions of a pandemic, although organisation and implementation may differ from region to region. Incorporated in this plan are a number of specific technical guidelines addressing issues essential during the current phase of pandemic alert. These guidelines may have to be adapted when new knowledge accumulates. Resources permitting, the Ministry of Social Affairs and Health and its expert organisations will support other administrative sectors in the development of preparedness plans for infectious disease threats and their implementation.

It is desirable that the present preparedness plan is widely used for training to improve preparedness, and in the preparation and implementation of adapted local plans. This plan also provides the base for strengthening the resources needed in different organisations. Assessment of the economic impact of an influenza pandemic will continue during the implementation of the preparedness plan.

4 INFLUENZA

Influenza is an acute inflammatory disease of the respiratory system, caused by either influenza viruses A or B and occurring annually in wintertime in epidemics. The reason for repeated epidemics (seasonal influenza) is that the superficial structure of both viruses is constantly mutating, and they are thus capable of evading the immune reactions created in the population during previous epidemics. Influenza A viruses occur as numerous subtypes in other animals and particularly in waterfowl. The letters H and N are used to describe the crucial surface proteins of the virus in terms of both transmissibility and human immunity, haemagglutinin and the neuraminidase enzyme. Several different subtypes and a number of different combinations of both occur in avian viruses. In humans, epidemic diseases in the last decades have been caused by two A virus subtypes, H1N1 and H3N2, and their composite virus (reassortant) H1N2. A previously healthy person usually recovers from influenza without any particular treatment within two weeks, but with the elderly and those suffering from certain chronic diseases, an influenza viral infections may cause a serious secondary disease. Prevention of influenza is effected through vaccination. The disease may also be alleviated by using antiviral drugs, with certain preconditions.

4.1 Influenza as a disease

4.1.1 Infection mechanisms, incubation period, infectious period

Influenza viruses spread from one person to another mainly through droplets. Infection through direct or indirect contact is also possible. There is also a possibility of airborne infection. Influenza viruses multiply in the epithelial cells of the respiratory system and are released into respiratory secretions. Particularly when coughing or sneezing, large numbers of secretion droplets of various sizes are released from the respiratory system, spreading across the immediate surroundings of the infected person, in reality to a maximum distance of a metre. Even microscopic droplets may contain sufficient numbers of viable virus to infect another person, if they gain access to membranes of the upper respiratory tract or the eyes, either directly (droplet infection) or via hands contaminated by respiratory tract secretions (direct contact infection). People may also be infected via hands from surrounding surfaces or materials, if respiratory tract secretions have contaminated them (indirect contact infection). Influenza viruses are easily destroyed by disinfectants, as well as by heating to above 60 ºC (cf. section 10.4).

The incubation period from the point of infection to emergence of symptoms is usually one to four days, but with children may take up to six days. During the incubation period, the virus multiplies in the organism, as the defence mechanisms responsible for creation of symptoms have not yet had time to develop. The virus may be present in respiratory tract secretions before manifestation of the symptoms, but the secretions are at their peak during the first and second symptom day. At that time, the chances of identifying the virus from secretions by laboratory tests are also at their highest. Subsequently, the virus content of secretions gradually declines. With adult influenza patients, the virus may usually be found in respiratory tract secretions within five-six days from the onset of the illness, but children may secrete the virus for up to three weeks.

4.1.2 Clinical description

With an adult influenza patient, a typical symptom is an acute fever, generally more than 38°C, rising possibly even above 40°C. Along with the temperature or soon after, at least one of the following symptoms arise: sore throat, dry cough, nasal congestion. In addition, typical cases present with headache and muscular pains. Usually, the temperature starts to decline on the third symptom day and returns to normal within five or six days. At the same time, respiratory tract symptoms, such as cough and nasal congestion may increase in severity. Nasal secretions may increase and respiratory symptoms continue for one to two weeks after the temperature has gone. In mildest cases, influenza may present as a head cold or an inflamed throat. With children, the commonest symptoms of influenza are a high temperature, cough and nasal congestion, but the disease may also include symptoms of the digestive tract, such as vomiting, diarrhoea and abdominal pains.

4.1.3 Complications

Although the majority of both children's and adults' influenza infections pass without treatment, a considerable number of serious complications are associated with influenza. With adults, influenza A/H3N2 causes the most serious consequences, while with children, both influenza A subtypes, A/H1N1 and A/H3N2, and influenza B may cause an equally serious disease.

There is no evidence of risk of deformity or other abnormalities in foetal development associated with ordinary influenza epidemics. However, several independent studies have described a slightly increased risk of developmental abnormality affecting the central nervous system associated with the 1957 H2N2 pandemic. There was no evidence of an increased risk associated with the 1968 H3N2 pandemic. New studies on the issue are ongoing.

The most dangerous complication of influenza is pneumonia, which during annual epidemics or so-called seasonal influenza is almost always caused by bacteria. The most common cause is *Streptococcus pneumoniae* (pneumococcus), but it may also be an infection caused by some other bacterium, such as *Haemophilus influenzae* or *Staphylococcus aureus*. Pneumonia may develop soon after onset of influenza symptoms, or typically not until the convalescence stage. It may be life-threatening with the elderly and with patients who are in poor health and suffering from various chronic diseases. During previous pandemics, particularly the so-called Spanish flu that began in 1918, pneumonia caused by the influenza virus has also occurred, often developing rapidly immediately after emergence of influenza symptoms and possibly leading to death within a few days. About a quarter of these affected young and otherwise healthy people, and in addition about 10 percent were pregnant women.

Inflammation of the heart muscle and meningitis are more uncommon sequelae associated with influenza. They are also linked to considerable mortality rates. Less severe but troublesome complications of influenza with children are commonly middle ear infections, and sinusitis with all age groups.

A proportion of the mortality rate caused by influenza is due to deterioration of heart and vascular diseases, pulmonary disease and other chronic conditions.

4.1.4 Influenza that passes from birds to humans

Known cases of human infection caused by the A/H5N1 avian influenza virus differ quite considerably from the clinical description of seasonal influenza. The incubation period is often longer, taking up to eight days, possibly even longer. Patients are usually running a high temperature and have symptoms indicative of lower respiratory tract infection very soon after the onset of the disease. Breathing difficulties, rasping breathing sounds and high breathing rate are typical observations. Almost all patients have clinically definite pneumonia, and microbiological test results to date indicate that the pneumonia is almost always viral. Functioning of many other organs is also disrupted, with impaired renal function and cardiac enlargement typical findings. In some cases, the predominant symptom has been diarrhoea, and in a couple of cases, the patient has had meningitis without respiratory tract symptoms. The mortality rate of virologically confirmed cases has been under 60 percent, and the patients have died on average nine–ten ten days after the onset of the disease. The majority of the patients have been children or young adults. If the A/H5N1 virus develops into a pandemically spreading form, the clinical picture may change to become less severe than is currently the case.

In 2003, an A/H7N7 influenza subtype caused a widespread poultry epidemic in the Netherlands. At the time of the epidemic, the same virus was found to have caused illness also in humans. One veterinary surgeon died from the avian influenza infection he had contracted, but the symptoms affecting the other 90 or so patients were very mild, mostly conjunctivitis or mild infections of the upper respiratory tract.

4.2 Protection from infection

The basic principles of protection against influenza infection are good hand hygiene and protection from respiratory tract secretions. Thorough and frequent hand washing prevents viral respiratory tract infections. (cf. 7.1.6 ”*Hygiene and disinfection measures*”)

Spread of the disease is prevented by covering the mouth and nose with a disposable tissue when coughing and sneezing and placing the used tissue immediately in the bin. The hands must be cleansed immediately after coughing or sneezing either by washing with soap and water or with alcohol-based disinfectant (cf. Appendix 7).

4.3 Vaccines

Vaccines have been employed in prevention of seasonal influenza for more than 50 years. Annual influenza inoculations can significantly reduce serious influenza infections, hospitalisation and deaths.

Because the composition of the vaccine varies each year, clinical investigations to ensure compliance with the immunogenicity, safety and efficacy requirements of the vaccine must also be repeated annually. The vaccine containing the new strains is approved through the EU Mutual Recognition Procedure, in which Finland participates.

Today, the vaccines most commonly used to prevent influenza are inactivated vaccines. In addition to inactivated vaccines, influenza vaccines containing live but weakened virus have been developed in recent years. The difference is that the inactivated vaccine is injected into muscle, but the vaccine containing live virus is administered via a nasal spray. Live vac-

cine virus is capable of multiplying in the epithelial cells of the upper respiratory tract, and as the result of a very mild infection the inoculated person develops immunity. Live vaccine viruses have been modified so that they are incapable of multiplying in the higher temperature of the lower respiratory tract.

In all European countries, influenza vaccinations are recommended for those in medical risk groups and the aged. In Finland, everyone over 65 has been included in the influenza vaccination recommendation under the general inoculation programme since 2002. In 2005, 52 percent of the over-65s were inoculated against influenza in Finland. In 2003, the WHO Health Assembly urged countries to step up their national influenza vaccination campaigns, so that risk groups would be more comprehensively vaccinated.

About 300 million doses of influenza vaccine are currently produced annually worldwide. In order to extensively reduce morbidity caused by an influenza pandemic, production capacity should be considerably increased in the next few years. Negotiations on joint vaccine production for the Nordic countries have taken place during 2006.

Production capacity can only be increased if the vaccine industry deems increased capacity to be feasible. Increasing inoculation coverage in the recommended groups and extending the vaccination programme to new medically justified groups, such as children, would reduce influenza morbidity in all age groups and increase consumption, production and availability of vaccines.

4.4 Antiviral drugs

4.4.1 Amantadine

The oldest of the influenza drugs, amantadine, has been used since the 1960s. Amantadine is an orally administered drug available only in tablet form. Thus, its use with children is difficult, although the drug is officially approved also for treatment and prevention of influenza in children over the age of two.

When amantadine treatment is begun within two days of onset of symptoms, the medication reduces duration of influenza symptoms in adults by about twenty-four hours. However, the medication is relatively frequently linked to side-effects affecting the central nervous system and the intestines, such as insomnia, headache, dizziness, lack of concentration and nausea. Amantadine is effective on the majority of influenza A viruses, but even some of the epidemic A virus strains are resistant to it. Conversely, amantadine has no effect whatsoever on B viruses. Nor has amantadine been found to be effective against topical H5 type avian influenza viruses, with the exception of a few isolated virus strains.

Perhaps the most significant drawback of amantadine is that during treatment, the patient quickly hosts new viruses resistant to this drug, with normal transmission capacity. For this reason, amantadine is today rarely used in treatment of influenza, but in influenza prevention it is still a viable drug for example for elderly people in residential care, provided that troublesome side-effects are minimised and that the circulating virus strains are sensitive to it.

Rimantadine is closely related to amantadine, and has been used in some countries alongside it. It is not available in Finland.

4.4.2 Zanamivir

Zanamivir was the first influenza virus neuraminidase inhibitor which came into the market in 1999. Zanamivir binds to influenza virus neuraminidase, preventing release from its surface of new viruses created in the host cell. Thus, zanamivir does not actually prevent influenza infection at cellular level, but its effective mechanism halts the progress of the infection in the organism.

Zanamivir is a powder, administered as inhalation directly into the respiratory tract in the same way as some asthma medications. In Finland, the approved indication for use of the drug is treatment of influenza in adults and children over 12. Although research shows zanamivir to be clearly effective also in prevention of influenza, this has not been approved as official indication for use in this country.

When treatment with zanamivir is begun within forty-eight hours of the onset of influenza symptoms, the duration of the disease is reduced on average by 1-1.5 days. However, the medication is the more effective, the more severe the patient's symptoms are when treatment is started. Zanamivir has also been reported to have some preventative effect on lower respiratory tract infections associated with influenza and treatable by antibacterial drugs, although only scant research knowledge exists on the efficacy of the drug in this context. Conversely, in prophylaxis following exposure to influenza within the family circle, the efficacy of zanamivir has been about 80 percent regardless of whether or not the first case in the family has been treated with the drug. Similarly, daily prophylaxis over four weeks administered during an influenza epidemic has been reported to reduce the incidence of influenza cases confirmed by laboratory tests by 67 percent.

Tolerance to zanamivir is very high. A rare reported side-effect is bronchospasm after inhalation. Therefore, it is recommended that at least patients suffering from asthma or chronic obstructive pulmonary disease should also have access to fast-acting medication that opens up the bronchial tubes during zanamivir treatment.

Zanamivir is effective on both A and B type influenza viruses. Development of resistance during treatment has been extremely rare. Usability of zanamivir, particularly with the elderly, is limited by the nebulator required to administer it, the use of which may be difficult for some patients, especially during the illness.

4.4.3 Oseltamivir

Oseltamivir is the other influenza neuraminidase inhibitor in the market. It was licensed for sale in 2002. Its mechanism of action is the same as that of zanamivir.

Oseltamivir is a drug taken by mouth, available both in capsule form and as an oral suspension. Its approved indications for use are treatment and prevention of influenza in adults and children over 1 year old. Dosage must be reduced for patients with serious renal failure.

Efficacy of oseltamivir in influenza treatment is akin to that of zanamivir; the total duration of the disease is cut by about 1-1.5 days, when treatment is begun within forty-eight hours from onset of the symptoms. There are no published directly comparative efficacy studies between different neuraminidase inhibitors. However, in the case of oseltamivir, efficacy of the drug has been shown to be critically dependent on how quickly after the onset of symptoms the treatment is started. If it is possible to start oseltamivir treatment within six hours of onset of the symptoms, the disease duration is cut by more than half of what it

would be if the medication is begun 36-48 hours from onset of symptoms. Oseltamivir has been shown to prevent complications linked to influenza and requiring antibacterial medication by about 55 percent and the total antibacterial medications by about 27 percent. It has also been reported to reduce hospitalisations by about 60 percent. In influenza treatment of children, oseltamivir can reduce development of acute middle ear infection as a complication of influenza by more than 40 percent, when treatment is begun within forty-eight hours from onset of the symptoms.

In long-term influenza prophylaxis lasting for six weeks, the efficacy of a daily dose of oseltamivir has been 76 percent. In post-exposure prophylaxis within the family, the efficacy of oseltamivir has also been 85-90 percent at individual level.

The most common side-effects of oseltamivir are nausea and vomiting, which occur in 5-10 percent of patients, depending on their age. However, these adverse effects are generally so mild that they rarely lead to interruption of the drug treatment. Gastric side-effects may be reduced by taking the medicine with a meal, and in any event they usually cease as the treatment progresses.

In principle, oseltamivir is effective against all A and B type influenza viruses. Development of resistant virus strains during treatment has been rare, but recent studies would indicate that development of virus strains resistant to oseltamivir during treatment, especially with children, may be considerably more common than has been thought. Similarly, very recent reports suggest that some influenza A/H5N1 virus strains currently posing a pandemic threat have been found to have reduced susceptibility to oseltamivir.

4.5 Principles and surveillance mechanisms of influenza diagnostics

4.5.1 Basic principles of influenza diagnostics

On estimate, 5-20 percent of the population contract so-called seasonal influenza every year, and about one in two of those infected develop the disease with typical symptoms. Even during a mild influenza epidemic, more than 125,000 inhabitants contract influenza in Finland. Only a small proportion seek medical help. Precise information on the incidence of influenza is only obtained from cases confirmed by laboratory tests. Only a small fraction of influenza cases is subjected to laboratory testing. Laboratory confirmation of influenza is either based on identification of the virus or a part of it in patient specimens of respiratory tract secretions, or by examining a sick person's blood samples and finding that his immune system has reacted to infection by the influenza virus by producing antibodies. In Finland, university virology and microbiology departments, microbiology laboratories of some hospitals, health centres and some private medical centres and laboratories provide viral diagnostic services. Customary patient diagnostics employ methods permitting identification of a possible virus in a respiratory tract secretion specimen as A or B virus usually within twenty-four hours at most.

The National Public Health Institute (NPHI) influenza laboratory carries out more precise subtype definitions on cases corresponding to exact clinical case definitions as part of national and international pandemic surveillance.

Case definitions applied during a pandemic as basis for decisions on treatment and surveillance are detailed in section 10.1.2.

4.5.2 National influenza surveillance systems

Finland has surveyed incidence of respiratory infections and influenza for a long time in selected population groups, such as conscripts. It is the intention of NPHI to initiate a surveillance scheme in cooperation with health centres and other organisations around the country. The mechanism will cover the whole population and be based on recording of symptoms, which would also aid detection and surveillance of influenza epidemics.

Most laboratories carrying out influenza diagnostics submit their positive findings to the National Register of Infectious Diseases maintained by NPHI, resulting in approx. 1,000-3,000 influenza diagnoses confirmed by laboratories.

The NPHI Influenza Laboratory also examines the specimens using the viral culture method. The laboratory isolates influenza virus from patient specimens, defines their type and subtype, analyzes their antigenic and genetic properties, and monitors mutation of the influenza viruses during the influenza season and between epidemics. The Influenza Laboratory operates as the WHO National Influenza Centre and reports regularly on surveillance results to the WHO headquarters, the Communicable Disease Surveillance Centre (London) and under bilateral reporting agreements to about 20 other national influenza laboratories.

4.5.3 International influenza surveillance schemes

About 120 national influenza centres from more than 80 countries participate in WHO international influenza surveillance. Many national centres (including NPHI Influenza Laboratory) submit their weekly findings to the WHO FluNet database. Based on virological and epidemiological data accumulated from national laboratories, the WHO group of experts issues its recommendation on vaccine viruses twice a year. One of the most important tasks of the WHO influenza laboratory network is identification of novel, uncommon influenza viruses, which in a worst case scenario may develop into causes of a pandemic.

Diagnosis of influenza in an individual patient purely on the basis of the clinical picture is impossible in reality, since many other viruses may cause a similar clinical description. Nevertheless, during an influenza epidemic, a patient running a temperature and with a cough, and with similar illness in the immediate environment, is highly likely to be suffering from influenza. Consequently, international influenza surveillance schemes often use the definition ‘influenza-like illness’, which is considered to give a better idea of incidence of influenza than would be achieved by recording all upper respiratory tract infections. Severe epidemic waves are reliably detected through the latter approach, too.

The European Union mechanism, the European Influenza Surveillance Scheme (EISS), collects virological and epidemiological data from member states and issues a report on the influenza status of the European zone between October and May. For the purpose of virological investigations, patient details and specimens are collected in health centres and private medical centres belonging to the sentinel surveillance system. The specimens are examined and the clinical-epidemiological information from the surveillance units is collated in the member state’s EISS laboratory, which submits it to the EISS centre situated in the Netherlands National Institute of Public Health and the Environment. The EISS statistics reveal both the weekly number of detected viruses and the number of health centre visits by patients suffering from influenza-like illness. Finland does not have the requisite surveillance system, but participates in the operation of EISS as an associate member.

4.5.4 Surveillance of influenza in animals

Influenza viral infections usually occurring without symptoms in wild birds may cause avian influenza epidemics in poultry, with symptoms of varying degrees of severity. Strains of the subtypes H5 and H7 have caused the most serious diseases. The World Organisation for Animal Health (OIE, Organisation Mondiale de la Santé Animale) monitors influenza cases and epidemics in domestic animals, particularly fowl and pigs. Authorities of OIE member countries report cases and epidemics to OIE. In an effort to put an end to epidemics, poultry that is either diseased or exposed to infection is destroyed, strict isolation measures are taken and transport of animals restricted. (Further information on the OIE website www.oie.int)

In Finland, the influenza laboratory of the Finnish Food Safety Authority (Evira) operating under the Ministry of Agriculture and Forestry monitors the influenza situation in poultry, imported fowl and pigs. The laboratory also participates in the influenza surveillance of poultry and migratory birds laid down by the EU. Further information on the Ministry of Agriculture and Forestry (www.mmm.fi) and Evira (www.evira.fi) websites.

4.5.5 Other sources of information on influenza epidemics

In recent years, the first information on epidemics affecting humans or animals in different parts of the world has often been obtained via the online ProMed service maintained by the International Society for Infectious Diseases. Doctors, epidemiologists, microbiologists, health authorities and other people around the world enter details of clinically and epidemiologically unusual or alarming cases and epidemics into this system, and the Society passes on the information via email and the Internet. Epidemiological observations are often reported even before the cause of the disease has been established in the laboratory. Information on new detections and epidemics obtained through official organisations, such as WHO and OIE and the Disease Control Centres of the United States (CDC) or Europe (ECDC) is often more accurate and reliable. However, at least in the early stages of epidemics it is often delayed, because these organisations generally only notify individual cases and epidemics confirmed by reference laboratories or epidemiologically investigated.

5 DEVELOPMENT PHASES OF A PANDEMIC

A risk of an influenza pandemic is only linked to influenza A viruses, which are classified as different subtypes according to the properties of the proteins, haemagglutinin (H) and neuraminidase (N), on the virus surface. 16 different subtypes of haemagglutinin and nine of neuraminidase are known, and especially influenza viruses of wild waterfowl contain numerous different HN combinations. Humans, pigs, horses and occasionally also other mammals have only been found with a few A virus subtypes.

A pandemic is created when a new subtype is transmitted to humans, and its spread is not curtailed by immunity based on previous influenza virus infections or inoculations. All pandemic viruses have originated from birds. In known cases, they have passed from birds to humans either gradually through adaptation (Spanish flu 1918) or through so-called reassortation, whereby the human virus has obtained genes originating from the avian virus (Asian flu 1957, Hong Kong flu 1968). Usually, avian influenza viruses transfer poorly to humans, and a long development process may be required before the virus is capable of effective multiplication and human-to-human transmission. Conversely, a virus created through reassortation may have properties enabling it easily and quickly to develop into a human virus and to cause a pandemic.

The pandemics of last century were only detected when the virus had already had time to spread widely and caused large-scale epidemics in different countries. Recent research indicates that the virus responsible for Spanish flu had infected individual people and caused relatively small epidemics years before the beginning of the 1918 pandemic. Evidently, the virus has gradually obtained properties of a pandemic virus, until in 1918 it began to spread rapidly around the globe.

Today, poultry epidemics and even single, unusual human cases can be quickly detected, thanks to the international influenza surveillance schemes coordinated by WHO, OIE, and the Food and Agriculture Organisation of the United Nations, FAO. Thus, development of a pandemic can be monitored phase by phase, and measures planned in an effort to prevent a pandemic or at least to slow down its development.

In the WHO Global Influenza Preparedness Plan published in 2005, development of a pandemic is divided into six possible phases. These phases are briefly described below and in Appendix 10. It is impossible to forecast the duration of the different phases; transition from one phase to the next may be very rapid or it may take several years.

5.1 Interpandemic period

Phase 1

No new influenza A virus subtypes have been detected in humans. An influenza virus subtype that has caused human infections may be present in animals, but the risk of human infection or disease is considered to be low.

Phase 2

No new influenza A virus subtypes have been detected in humans, but a circulating animal influenza virus subtype poses a substantial risk of human infection and disease.

5.2 Pandemic alert period

Phase 3

New influenza A virus subtype infections from animals to humans occur, but there is no human-to-human transmission, or at most rare instances of spread through close contact.

Phase 4

A new influenza A virus subtype has caused small disease clusters, indicating that human-to-human transmission is limited. Infection chains are very localised, indicating that the virus is not yet well adapted to humans.

Phase 5

A new influenza A virus subtype has caused geographically limited large disease clusters. This suggests increasing adaptation of the virus to humans. The virus does not yet appear to be fully transmissible human-to-human (substantial pandemic risk).

Transition from phase 3 to phases 4 or 5 may take years, but it may also happen rapidly. In addition to case numbers and cluster sizes, phase classification depends on the severity of the illness caused by the virus and estimates regarding its transmissibility that may be made based on the genetic or other properties of the virus. Efforts are made to prevent increase in pandemic threat by cutting off human infection chains, e.g. with the aid of isolation, trace-back investigations and preventive medication. In theory, it is also possible that infections of a subtype new to humans can be halted in animals at phase 3, enabling return to phase 1 or 2.

Even if the events of phases 3-5 take place outside Finland and Europe, it is possible that individual infected persons enter Finland. If this happens as early as in phase 3, the subsequent phases may also occur in Finland.

WHO aims to develop international procedures, allowing phase 4 (and possibly phase 5) to be detected almost in real time, and effective preventive measures to be initiated to break infection chains and to halt the spread of the epidemic. The objective is to prevent formation of a comprehensive pandemic. The draft document published by WHO in 2006 defines the duties of national and international authorities in order to limit localised epidemics.

5.3 Pandemic period

Phase 6

The virus is fully adapted to humans and spreads in the population, causing widespread epidemics crossing geographic boundaries. A worldwide pandemic is imminent.

Development of a pandemic cannot be halted at this phase. All resources should be concentrated on alleviating the effects of the pandemic. At previous pandemics, the first pandemic wave has been followed by a second and possibly even a third wave, months after the first wave subsided. The second wave may be equally or more severe than the first.

5.4 Postpandemic period

Return to interpandemic period.

6 POSSIBLE CONSEQUENCES OF A PANDEMIC

6.1 Impacts on health and the healthcare system

6.1.1 Scenario based on knowledge accumulated from previous pandemics

The World Health Organisation WHO states in its Global Influenza Preparedness Plan[1] that it is impossible to predict the timing, intensity, or impacts on the healthcare system and other societal functions of the next pandemic. However, in order to draft a national pandemic preparedness plan, assumptions must be made on the kind of impacts the next pandemic may have on healthcare and the rest of society. Thus, the following sections are only assumptions made in order to estimate required resources, not forecasts. Only when the pandemic virus has caused relatively extensive epidemics are factors determining its impacts revealed, consisting of at least the following: particular properties of the pandemic virus genotype and structure, human-to-human transmissibility, pathogenicity and drug susceptibility, possible partial immunity in certain population groups and available vaccines, antiviral drugs and other measures that may be employed in an effort to reduce numbers of new infections.

By the end of September 2006, the A/H5N1 avian influenza epidemic, originated at the end of 2003 in South Korea, had caused the laboratory-confirmed disease in 252 persons. Almost 60% of them had died. Even if the A/H5N1 was to develop into the next pandemic virus, case mortality is unlikely to remain at this level.

Adaptation of an avian virus to humans may take a long time. That is why it is possible that before an actual pandemic wave, the pandemic virus may cause infection chains of varying lengths in humans, some of which may also reach Finland. Attempts should be made to interrupt them through active isolation, treatment and preventative measures. This way, the start of a pandemic might be delayed, but it cannot be prevented.

The first pandemic wave, causing great morbidity, may be followed by one or more subsequent waves after months or a year. Their morbidity in previous pandemics has generally – albeit not necessarily – been lower than during the initial wave.

6.1.2 Basic assumptions for drafting preparedness plans

Observations made during pandemics of the past century may be utilised when modelling potential impacts of the next pandemic. The fundamental problem is that the degrees of severity of those three pandemics were very different, particularly in terms of case mortality. (Table 1)

[1] http://www.who.int/csr/resources/publications/influenza/WHO_CDS_CSR_GIP_2005_5.pdf

Table 1. Figures from pandemics in the 1900s

Pandemic and starting year	Estimated number of dead worldwide	Morbidity in USA	Case mortality in USA
Spanish flu 1918	50 million	25 %	1.9 %
Asian flu 1957	1.5 million	30 %*	0.14 %
Hong Kong flu 1968	0.7 million	25 %	0.07 %

* During the Asian flu pandemic, morbidity in the United Kingdom was 57 % and 188/100,000 inhabitants were hospitalised[2].

\# The UK Influenza Pandemic Contingency Plan takes the basic model case morbidity as 0.37 % and for worst case scenario 2.5 %.

In the following sections, the assumption in calculations concerning Finland is that during the first pandemic wave, in the absence of effective vaccine or drug prophylaxis, 35 percent of the population will contract influenza within two months. We will also briefly outline the result of a second model, applying a lower degree of morbidity and adapted for Finland.

6.1.3 Need for primary healthcare services

Not all who contract pandemic influenza become seriously ill. An estimate in the United Kingdom is that only 10 percent of those infected visit a doctor's surgery, where under the country's preparedness plan the possible need for hospitalisation and treatment of complications of influenza is assessed. Depending on the properties of the pandemic virus, however, the influenza may cause complications and deaths in all age groups and even basically healthy people. When the aim is treatment with antiviral drugs as early as possible (<48 h from onset of symptoms) of as large a proportion as possible of those infected, in order to reduce hospitalisation, complications and deaths, the need for outpatient services is much greater than the UK estimate would indicate; in principle, they are needed by all those affected. Clearly, a need of this magnitude cannot be fulfilled within the framework of customary surgery facilities.

The table below shows the estimated weekly outpatient contact requirement based on this worst case scenario. The estimate makes the assumption that the cases are symmetrically distributed over a period of eight weeks, nevertheless including a relatively sharp two-week peak period. The peak of a pandemic wave may also be much less pronounced, but in an individual location the epidemic peak may be even sharper than that shown in Table 2. It is likely that the epidemic wave will not occur simultaneously in all parts of Finland. The distribution of weekly incidences of illness presented in Table 2 may be useful in estimating the impacts of a pandemic on various functions of society.

[2] Gani et al. http://www.cdc.gov/ncidod/EID/vol11no09/04-1344.htm

Table 2. Outpatient services requirement during an eight-week pandemic

Measure	Pandemic week							
	1	2	3	4	5	6	7	8
Percentage of population	1	2	5	10	9	5	2	1
Number In Finland	52,000	104,000	260,000	520,000	468,000	260,000	104,000	52,000
Number / 100,000	1,000	2,000	5,000	10,000	9,000	5,000	2,000	1,000

6.1.4 Need for hospitalisation and mortality

The following shows the impacts of a pandemic on the need for hospitalisation and mortality. The results are based on two different models using different base assumptions.

The USA Centers for Disease Control and Prevention (CDC) has developed a Microsoft Excel based FluSurge program[3], which can be applied to estimate usage of hospital services during a pandemic. The model makes the assumption that need for hospital care and mortal risk depend on the age of the infected person according to a certain formula. It is further assumed that the duration of hospitalisation is on average seven days, approx. 15 percent of influenza patients admitted into hospital require intensive care, and about 7.5 percent need a respirator. Intensive and respirator care is estimated to last on average 10 days. It should be noted that these assumptions do not necessarily correspond to Finnish treatment practices and that in any case they are only assumptions made for the purpose of calculating estimates. Furthermore, the FluSurge program does not take account of antiviral drugs or vaccines possible employed, which may significantly reduce requirements for hospitalisation and mortality rates.

Tables 3 and 4 show the FluSurge program applied to Finland, using population numbers in various age groups as published by Statistics Finland in 2004[4] and making the assumption that 35 percent of the population will be infected within eight weeks. Table 3 shows the 'average', 'mild' and 'severe' scenarios created using the programme. This estimate makes the assumption that of those affected, 1.51% (0.63–1.96%) will require hospitalisation. The table shows the numbers of weekly hospitalisation periods and deaths. Table 4 shows estimated numbers of patients admitted and already staying in hospital and intensive care and respirator requirements (the figures are per 100,000 population). The case mortality shown in the severe scenario in Table 3 (0.5% of all clinically affected patients) may also be an underestimate.

[3] http://www.cdc.gov/flu/flusurge.htm

[4] http://www.tilastokeskus.fi/tup/suoluk/suoluk_vaesto.html

Table 3. Patients requiring hospitalisation and deaths during an influenza pandemic (calculated using the FluSurge software; assumption that 35% of population affected within 8 weeks)

Scenario	Population	Periods of hospitalisation	Deaths
Average	Whole country	27,500	5,650
	Cases per 100,000 population	530	109
Mild	Whole country	11,480	3,450
	Cases per 100,000 population	221	66
Severe	Whole country	35,690	9,050
	Cases per 100,000 population	686	174

Table 4. Weekly usage of hospital services during a pandemic lasting eight weeks, when morbidity is 35 percent (incidence per 100,000 population, calculated using FluSurge software)

Scenario	Event	Week							
		1	2	3	4	5	6	7	8
Average	Influenza patients admitted into hospital	21	53	79	101	101	79	53	32
Mild	Influenza patients admitted into hospital	13	22	33	42	42	33	22	13
Severe	Influenza patients admitted into hospital	41	69	103	130	130	103	69	41
Average	Influenza patients in hospital	21	53	79	101	106	97	75	50
Average	Influenza patients in intensive care	5	10	16	20	22	22	17	12
Average	Influenza patients requiring respirator	2	5	8	10	11	11	9	6

It should be noted that the estimates easily result in very different figures, depending on base assumptions and the formula applied. The estimates of different countries have been variable e.g. in terms of the proportion of those requiring hospitalisation in relation to all those affected, and the assumed case mortality rates. A French modelling study[5] on possible impacts of an influenza pandemic has made base assumptions diverging from the above: the total morbidity of the pandemic is 25 percent of the population, but the proportion of those requiring hospitalisation greater than described above and case mortality 0.8 percent of those affected. Applied to Finland, this estimation model results in a good 50,000 periods of hospitalisation caused by the influenza pandemic and deaths of approx. 10,000 people, or greater figures than those given by the FluSurge model, despite a lower base assumption or total morbidity.

[5] Doyle A., et al, unpublished data

6.2 Economic and social consequences

In addition to health risks affecting the population, the economic, social and political impacts of an influenza pandemic are wide-ranging. During the SARS epidemic, Hong Kong estimated the financial losses for South-East Asia at about 60 billion US dollars, and in Toronto, the losses were estimated at 2 billion Canadian dollars, in spite of the fact that the whole epidemic only involved around 8,000 cases, with about 250 in Toronto. The majority of the financial losses affected sectors other than healthcare.

In addition to direct healthcare costs brought about by the disease and the reduced productivity of those affected and those caring for them, a pandemic alert and an actual pandemic cause economic losses, particularly for tourism and commerce.

The avian A/H5N1 influenza epidemics that have occurred in an increasingly wider area in Asia have caused concern among those planning to travel to those countries. The small number of human cases and the absence of infections transmitted between humans have prevented extensive losses in tourism in these destinations for the time being. Despite information on risks and their prevention, enquiries from the public would indicate that even a small increase in the A/H5N1 virus human-to-human transmission rates would result in significant decline in tourism in the affected regions. As a result of isolated 'probable cases of SARS' occurred in Finland at the time of the SARS epidemic, foreign organisers of conferences and travel began to cancel trips and meetings regardless of the fact that SARS was very quickly eliminated by further investigations. At the time of the SARS epidemic, demand for tourism services to South-East Asia fell quickly and substantially. The current view is that travel restrictions or screening and preventive methods targeted at travellers at border crossings are not important in limiting the progress or effects of a pandemic. Nevertheless, it is likely that due to perceived risk and possibly the precautionary principle dictated by political pressure, some countries will issue even unfounded restrictions, causing significant and unnecessary damage to tourism.

Particular problems are posed by international operation under a pandemic alert of Finnish companies in countries with poultry epidemics spreading infections, or the first human epidemics. Company-specific travel restrictions or decisions to repatriate personnel may be adopted on the basis of personal or company-specific risk assessment, which would significantly damage business operations. Furthermore, employers' health and safety obligations must be taken into consideration, and these may be problematic in cases of international workforces. Decisions taken may have considerable economic consequences for affected companies and consequential effects on many business contacts.

Influenza is a zoonosis, or an infection affecting both animals and humans. In the present alert phase caused by the A/H5N1 avian influenza, the infection is primarily an animal infection, which occasionally infects humans in specific exposure situations. Poultry epidemics are restricted by quarantining and destroying animals, which in South-East Asian countries has led to financial hardship of especially people keeping small numbers of poultry for domestic use. Because infection is possible through handling sick animals or animal products, avian flu epidemics have resulted in widespread trading restrictions of poultry from epidemic countries. Although the objective of the restrictions is primarily prevention of the spread of a veterinary disease from one country to another, concern arises among the public over the risks of even harmless animal products. This leads to considerable financial losses for both producers and trade. In Italy, where there were no avian A/H5N1 cases in 2005, consumption of poultry products collapsed in the autumn of 2005, and the losses incurred were already estimated at hundreds of millions of euros two months after news broadcasts on avian flu epi-

demics in other countries began. With increased pandemic threat as numbers of human-to-human transmission of the virus increase, the disease is increasingly one limited to humans alone, and the importance of animals as source of infection decreases. In pandemic situations, the role of animals in terms of infection risk is insignificant in practice. At the time of the SARS epidemic, certain countries set import restrictions on other than animal products too, although there was no indication that the products may have transmitted infections.

A pandemic causing widespread illness among the population has societal impacts. Threat of infection may cause tensions between employees and employer, for example when service sector work is linked with a particular risk of exposure to influenza infection. Especially in healthcare, the risk of infection caused by work obligations and the work itself is associated with issues of work ethics that are crucial with regard to functioning of the healthcare system. Prioritisation of means of prevention or treatment in limited supply may cause socially divisive debate. Severe morbidity in the various work sectors of society may seriously restrict services included in normal basic security.

The Government Institute for Economic Research (VATT) has analysed impacts of an influenza pandemic on the national economy. A pandemic would severely impact on the labour resources available to the national economy. A pandemic would have a similar impact to that of a deep recession. It must be assumed that the impacts would be the greatest in labour-intensive service sectors. Some of the alternatives make the assumption that morbidity would be greater in the service sectors than in industry. Sickness absences and increased mortality would also have a long-term adverse effect on the national product. The results of the study are available on the National Emergency Supply Agency website www.huoltovarmuus.fi.

In Finnish conditions, care of the sick alone would incur direct additional costs to both the state and local authorities. The magnitude of the costs demands their reasonable division between the state and municipalities.

The transnational, global nature of a pandemic creates situations that require intensive international concerted action. Divergent views or procedures may develop for different reasons between countries. The International Health Regulations, revised under the coordination of the World Health Organisation (WHO) and coming into force in 2007, lay down new procedures at sudden threatened infectious diseases. A particular aim is early, open communication of information, interaction between WHO and member countries when deciding on procedures and recommendations, and an effort to find uniform measures that cause minimal damage to tourism and trade. Nevertheless, it is possible, indeed probable, that information on the threat situation will be obtained slowly from some countries. Countries may also impose restrictions on tourism or trade that are neither recommended by WHO nor supported by other countries. This is likely to lead to tensions between countries. Particularly problematic may be divergent ideas of neighbouring countries on necessary measures. The EU and the European Centre for Disease Prevention and Control (ECDC) it set up in 2005 support EU member countries in creating uniform procedures in healthcare, although the actual decisions on measures are taken in member countries. However, e.g. in the administrative sector of the Ministry of Agriculture and Forestry, preventive measures are subject to uniform regulation in all member countries through EU-level regulations and decision-making.

Finland is one of the wealthy industrial countries able to obtain the vaccines, drugs and equipment necessary for preparedness. In global terms, even within the EU, there are considerable differences in material preparedness of countries. Developing countries do not have the resources to prepare for a pandemic. At different phases of a pandemic alert, issues related to international solidarity will arise, for the effective resolution of which national and international procedures should be ready and in place.

7 WAYS OF MINIMISING THE IMPACTS OF A PANDEMIC

7.1 Slowing down the spread of infection

There are a number of possible ways of prevention (appendix 3), not based on using vaccines or drugs, of a threatened influenza pandemic (WHO phases 3–5) or a pandemic (phase 6). Their aim is (1) reduction of transnational spread of the virus through e.g. travel restrictions and screening of passengers, (2) prevention of infections within each country and between populations of different regions, through e.g. isolation and treatment of the sick, monitoring and quarantine of those exposed to infection, measures increasing social distance, such as closing educational institutions, (3) reduction of infection risk of individual persons through e.g. hand hygiene, and (4) educating the population on the risk and individual preventive measures.

During pandemic alert phases 3-4, it is important to prevent infections from animals to humans by preventing influenza virus infections causing a threat of a pandemic in production animals, particularly poultry. When poultry is infected with an influenza virus causing a pandemic threat, transmission to humans is prevented by means described in Appendix 4 *Reducing the risk of human infection during an avian influenza epidemic affecting poultry.*

Recommended preventive measures not based on using vaccines or drugs, in Appendix 3, lists preventive measures in a pandemic alert situation or a pandemic, albeit with little scientific evidence on their effectiveness. Experiences gained during previous pandemics have led to an idea as to which preventive measures are likely to have had an effect on the courses of the pandemics, and which have probably been useless.

Knowledge has accumulated from annual seasonal influenza epidemic situations and their prevention, which is useful in preparing guidelines for prevention of a pandemic. During the SARS epidemic in 2003, extensive preventive measures were implemented in some countries and in international air travel, and detailed accounts have been published on their feasibility and usefulness in preventing the spread of the disease in question. Due to differences related to transmission routes of influenza and SARS, caution is necessary when applying experiences gained from prevention of SARS to prevention of pandemic influenza.

During the pandemic alert phases and during the pandemic, investigations are carried out which help clarify knowledge on the effects of preventive measures. Guidelines are issued accordingly, and ineffective or unnecessary measures discontinued. WHO plays a central role in drawing up and updating recommendations. The European Centre for Disease Prevention and Control (ECDC) is an important agent in dissemination of the knowledge base on preventive measures.

The WHO panel of experts has prepared the recommendations in Appendix 3 on measures to help prevent an influenza pandemic through means other than vaccines and pharmaceutical products. The recommendations issued by WHO are included in the appended table as they are, with the exception of very slight modifications due to Finnish conditions.

The recommendations on use of different preventive measures vary in the distinct pandemic phases defined by the WHO. The reason is that the objectives of preventive action are significantly different between phases 3-5 and phase 6.

In phases 3-5, the number of cases is small. The objective of the action is to prevent a pandemic altogether or to significantly delay the timing of its onset. Once the pandemic has begun (phase 6), the aim is to delay the timing of the pandemic peak, minimisation of adverse effects to the health of the population, and securing of vital functions. During a pan-

demic, case numbers are very high and the infection risk for the whole population is so great that certain preventive measures used in phases 3-5 are no longer feasible, due to limited resources. Some methods used in phases 3-5 would no longer have any effect on the progress of the pandemic at phase 6.

In previous pandemics, the effects on the health of the population have fluctuated a great deal. Obviously, as the pandemic alert progresses, the estimate of the severity of the imminent pandemic affects particularly application of preventive measures that cause significant disruption in functioning of society. If information available at pandemic alert phases 4–5 indicates a threat similar to that of the Spanish flu of 1918, in societal terms it is more justifiable to employ extensive preventive measures that would cause disruption to society than if the forecast made at phases 4–5 indicates a pandemic similar to those of 1957 and 1968 (Asian flu, Hong Kong flu; see section 6.1).

The WHO preparedness plan divides nonpharmaceutical interventions into subsections below, with headings referring to the detailed analysis in the WHO plan of each pandemic alert phase, in Appendix 3, *Recommended preventive measures not based on using vaccines or drugs*. Some of the areas of these preventive actions will be dealt with in more detail in other sections of the plan, with references below.

7.1.1 Public health information, communication

Provision of information to the population and professional groups taking part in preventive action will be proactive during all pandemic alert phases and the pandemic itself. The aim of the information is to provide each target group with essential information on the epidemic and risk of infection, as well as prevention, without engendering unnecessary alarm among the population. It is particularly important to provide advance information on the next alert phases. The purpose is to support preparedness arrangements of various organisations and to educate the population as to how every citizen can affect the risk of infection. Provision of information will be dealt with in more detail in section 13.

7.1.2 Measures to reduce risk that cases transmit infection

The detailed measures are set out in the Pandemic Plan sections 10.3.1 *Treatment chain in patient care and placement* and 10.4 *Protection against infection in healthcare*

7.1.3 Measures to reduce risk that contacts transmit infection

At pandemic alert phases 3-5, it is essential to break the infection chain by targeting the actions on symptom-free persons who have been in close contact with patients infected by the influenza virus causing a pandemic threat. The identification and tracing of those exposed, post-exposure preventive use of antiviral drugs and use of quarantine are dealt with in more detail in section 10.2 *Measures targeted at those exposed.*

Tracing of contacts during the pandemic is no longer justified; since infections take place commonly in all population groups, the action will not affect the course of the pandemic, and resources required for trace-back investigations are not available.

7.1.4 Measures to increase social distance

Transmission of respiratory tract infections, such as influenza, can be reduced by staying at home at the onset of symptoms. The population will be provided with guidance on how risk of infection can be reduced at home, when a person becomes ill. A mildly affected person can often do remote work at home. Prior preparations for this option should be made.

During pandemic alert phases 4-5 and during the actual pandemic, it may be justified to issue recommendations or orders e.g. on closing pre-schools and schools, cancelling public events, sending national servicemen on leave, or closing public facilities (e.g. sports and cultural facilities). In such cases, expert recommendations are made according to an estimate based on information accumulated in the initial phases of pandemic alert on the characteristics of the relevant virus, and the importance of infections taking place in schools or other communities in terms of the progress of the pandemic at the phase in question.

There is no evidence of the efficacy of the public using a mouth-nasal face mask in prevention of infection during an influenza epidemic or seasonal influenza. WHO does not recommend use of face masks for the population, but accepts that the knowledge base regarding the usefulness of this method is inconclusive. Properties and recommended uses of face masks are laid out in more detail in section 10.4 and Appendix 6. Guidelines on protection of persons exposed to birds or their secretions, required in case of a possible poultry influenza epidemic, are included in Appendix 4.

7.1.5 Measures to decrease interval between symptom onset and patient isolation

During all phases of pandemic alert and the actual pandemic, infections may be reduced by providing information in a way that helps those affected to recognise their illness at an early stage as suspected influenza causing a pandemic threat (phases 3-5) or a probable case of pandemic influenza (phase 6). Early recognition of his own illness by the patient leads in phases 3-5 to the appropriate healthcare unit and efficiently executed isolation, and during phase 6 to behaviour reducing infections (home nursing, hygiene) and to an appropriate treatment facility. Healthcare arrangements are described in more detail in section 10.3.

7.1.6 Disinfection measures

Comparative studies provide some evidence that thorough and frequent hand washing by the population prevents viral respiratory tract infections. Use of disinfectants in this context does not improve effectiveness. The recommendation differs from those given to healthcare personnel, because in healthcare hand hygiene recommendations also have other objectives related to infection prevention. There is no research-based evidence of the part played by measures related to coughing hygiene in transmission of influenza. However, infection caused by droplets created by coughing and sneezing is an important influenza transmission mechanism. Consequently, it is justifiable to inform the population about a way of coughing that reduces the spread of droplets and their likely contact with hands or surfaces in the environment (Appendix 7).

Contamination of surfaces with respiratory tract secretions must be avoided. If soiling takes place, the surfaces must be thoroughly washed with proprietary detergents.

During the pandemic alert phase or an actual pandemic, a recommendation may be issued of avoiding greetings requiring hand-shaking or other personal contact, in order to minimise contact infections.

In public buildings, people should avoid as far as possible touching surfaces that may be contaminated by respiratory tract secretions.

Protection from infection in healthcare is addressed in section 10.4.

7.1.7 Measures for persons entering or exiting an infected area within the country

During the different phases of pandemic alert and full-blown pandemic, the population will be urged to avoid environments and especially exposure situations linked to the epidemic situation current in Finland. If there are areas in Finland that are free from influenza causing the alert or pandemic, a recommendation to put off non-essential travel is justified during phases 4-6. However, it is not expedient to actually prohibit travel within the country, if a situation causing a pandemic alert only arises in some areas of the country.

7.1.8 Measures at borders for persons entering or exiting the country

During a pandemic alert and an actual pandemic, WHO will issue situation-specific recommendations on measures related to international traffic and trade, to expand on guidelines contained in the WHO Global Influenza Preparedness Plan (see bibliography). Within the EU, preventive measures will be implemented in the same way in the different member countries as far as possible, based on consultations between the Commission, member countries and ECDC.

Ineffectual inspection and restriction measures in terms of prevention may result in great international economic and social losses, while having no effect on the course of the pandemic alert or the pandemic itself. That is why it is crucial that measures are based on recommendations of the key international organisations mentioned above. WHO emphasises that the core measures in terms of pandemic prevention take place on national level within each country, with measures directed at international traffic having little importance in pandemic prevention.

Most important is informing passengers of the current epidemic situation. They will be provided information at appropriate junctures, such as airports and border crossings, on the disease and infection risks, as well as action to take after possibly becoming ill after the trip. Depending on the nature of the alert situation, recommendations will be issued to put off non-essential international travel.

Screening of passengers entering Finland from pandemic alert areas in order to detect symptoms or identification of those belonging to a risk group using a form filled in during travel are not useful measures. This has been shown by experiences of previous influenza pandemics and the SARS epidemic.

Screening of passengers from pandemic alert areas where infections have been diagnosed in humans through questioning or taking the temperature may be justified during pandemic alert phases 4-5 and a full-blown pandemic. Travel of those who are sick from alert areas must be postponed.

A passenger may succumb to an influenza-like illness also during a flight. During pandemic alert phases 4-5 and an actual pandemic, passengers will be urged to report any influ-

enza-like symptoms to the cabin crew. The crew will isolate sick passengers as far as possible in a separate part of the aircraft. Health authorities of the destination country will relay to other countries the passenger information necessary for pandemic prevention and tracing of those exposed in the aircraft.

7.2 Vaccines

7.2.1 Influenza vaccines

From prototype vaccine to specific vaccine

The most effective means of prevention of the adverse impacts of an influenza pandemic would be a vaccine made to combat the virus that causes it. However, production of such a specific vaccine can only begin once WHO has declared that a pandemic is under way. Since the vaccine manufacturing process takes several months, it is unlikely that a specific vaccine will be available during the first pandemic wave. However, past pandemics have occurred in several waves, and the specific vaccine would probably be available to prevent a second wave. The specific vaccine to be developed for the next pandemic is likely to contain inactivated genetically modified entire pandemic virus or parts isolated from them.

The ability to manufacture and introduce a specific vaccine as quickly as possible is based on research carried out using a prototype vaccine. Approval of the manufacturing method of a prototype vaccine and fulfilment of the criteria of clinical studies is a precondition of manufacturing a specific vaccine.

The prototype vaccine is made using an influenza virus isolated from birds and known to have caused the disease in humans. The most commonly used virus in 2005–06 is A/H5N1. Depending on the manufacturer, the prototype vaccine is made in eggs or cell cultures. Characteristics of prototype vaccines containing different quantities of antigens and adjuvants (substances that boost the effect of the vaccine, especially the immune response) are studied by vaccinating laboratory animals and humans. The formula of the test vaccine creating the best immune response is documented and the vaccine sales licence applications submitted to the European Agency for the Evaluation of Medicinal Products, EMEA). With this procedure, production of a specific vaccine can be started immediately after WHO has declared a pandemic, and once the pandemic virus of the subtype in question is isolated and genetically modified to suit vaccine production. At this point, an application for a sales licence is also submitted to EMEA for the actual specific vaccine. As well as using prototype vaccine studies to speed up specific vaccine production and approval for use, the prototype vaccine itself may also be used to protect the population.

At the onset of a pandemic, inoculations to protect the population should be started as soon as possible. However, obtaining the actual specific vaccine takes time. The first doses will be available at the earliest three months after the pandemic is declared, and it will take at least six months before the vaccine is available in Finland. Therefore, purchasing a stock of the prototype vaccine for possible quick application has been deemed expedient in Finland, although there can be no prior certainty of its efficacy of protection. Finland has decided to obtain sufficient prototype vaccine to inoculate the entire population. If the pandemic virus is only slightly different from the prototype vaccine virus, quick initiation of inoculations may reduce severe illness and fatalities. To boost the protection, a second dose using the specific vaccine will be administered as soon as it is possible. Targeting of vaccinations and practical guidelines are addressed in section 10.6.

Authorisation of model and specific vaccines

The sales licence application of the prototype vaccine is submitted to the European Agency for the Evaluation of Medicinal Products (EMEA) and the application is evaluated by the Committee for Proprietary Medicinal Products (CPMP). After this, the EU Commission makes the actual decision. For the sales licence application of a specific vaccine based on the prototype vaccine, a variation application is submitted to EMEA, listing modifications to be made to the vaccine, such as change of virus stock. Following this procedure, it is possible to obtain a licence for a pandemic vaccine (specific vaccine) in about a week. A sales licence granted by the Commission is valid as such in all member states.

In addition, the Finnish National Agency for Medicines must, if necessary, make a decision on the requirements set on releasing vaccines to be used in pandemic prevention in Finland.

Should a pandemic begin before the manufacturer's prototype vaccine has had time to obtain an EU licence, the same manufacturer's specific vaccine cannot obtain a licence either through the fast-track procedure. In such a situation, the Communicable Diseases Act allows the Ministry of Social Affairs and Health to use vaccines in order to prevent an infectious disease epidemic directly and seriously threatening public health. The National Agency for Medicines will provide expert assistance if required.

Special features of production

Once a pandemic has broken out, worldwide demand for the vaccine will be enormous, and the preparation must be available for extensive use as quickly as possible. Fulfilling these expectations is a particular challenge for vaccine manufacturers.

A total of 300 million doses of ordinary influenza vaccines are manufactured in the world every year, 190 million of them in Europe. However, only 90 million doses of the European production remain for use by the EU countries, the rest is exported. If all 450 million Europeans are to be protected by vaccination at the onset of a pandemic, the number of vaccine doses required is considerably larger than normal. Taking the whole world into consideration, the shortfall in production capacity is greater still.

Development of a pandemic is based on the fact that the population lacks the immunity against the virus causing the pandemic created by previous infections (antibodies or immunological memory). For as small a quantity of antigen as possible to create a protective immune response in such a population, 'naïve' in terms of a new virus, the immunogenic effect of the vaccine must be increased by adding a booster substance or adjuvant. In order to achieve good protection, two doses of vaccine are evidently required.

Most vaccine manufacturers have made plans to increase vaccine production in the next few years. To date, influenza vaccines have been produced solely in eggs, but now cell culture has emerged alongside this method. This increases vaccine production capacity, but building and authorisation of production plants engaging in cell culture also takes time.

Countries with no vaccine production of their own can try to secure availability of the specific vaccine by entering into a contract with the manufacturer on vaccine supplies, so that the specific vaccine is available as soon as possible at the start of the pandemic. Obtaining the vaccine requires purchasing a 'place in the queue' for vaccine production, which in practice means payment of an annual reservation fee. Finland has signed a five-year contract with a Dutch vaccine manufacturer, under which it undertakes to supply Finland with 5.5 million doses of specific vaccine following a schedule which would make the vaccine available in Finland about six months after the onset of the pandemic.

7.2.2 Other vaccines

Because various bacterial infections may develop as complications of an influenza virus infection, adverse effects of a pandemic may be mitigated by inoculating the population with vaccines targeted at such bacteria either before the pandemic or once it has already begun. Of vaccines currently available, only pneumococcus vaccines may be viable in this sense. Because the effectiveness of available pneumococcus vaccines against the most common serious complication of influenza, pneumonia, is either negligible (polysaccharide vaccine) or relatively slight (conjugate vaccine tested on children) according to most recent studies, general pneumococcus inoculations are unlikely to substantially reduce the adverse effects of a pandemic. Usefulness of pneumococcus vaccinations should be reassessed, if new pneumococcus vaccines come into the market or significant new research results are obtained on the efficacy of the vaccines.

7.3 Antiviral drugs

Antiviral drugs may be used in conjunction with other preventive measures in order to interrupt or delay development leading to a pandemic during WHO pandemic alert phases 3-5. At the pandemic phase (phase 6), the objective in using antiviral drugs is to minimise complications, fatalities and loading on healthcare by treating patients presenting with symptoms.

Susceptibility of the virus causing the pandemic alert to antiviral drugs is the decisive factor as to which drugs are useful during the various pandemic alert phases and the pandemic itself. The influenza virus creating the alert may be resistant or it may develop a resistance to one or more drugs. Recommendations on drug usage are based on latest information in other countries or in Finland on susceptibility of cultured viruses. Due to changes in the susceptibility status, recommendations on choice of drug, indications for use and dosage may change quickly during the different pandemic alert phases or the pandemic itself.

Influenza antiviral drugs belonging to both the adamantine group (amantadine, rimantadine) and neuraminidase inhibitors (oseltamir, zanamivir) have been shown in comparative studies to be effective in prevention of seasonal influenza caused by the influenza A virus. Early administration of both groups reduces the duration of influenza. Neuraminidase inhibitors reduce development of influenza complications; there is no evidence of this with drugs from the adamantine group.

Use of influenza antiviral drugs in treatment of the patient, short-term post-exposure prophylaxis and long-term preventative drug therapy during the different pandemic alert phases and the full-blown pandemic are addressed in more detail in section 10.7 *Indications for use of antiviral drugs and prioritisation.*

8 ADMINISTRATION, AUTHORITY STRUCTURE AND ORGANISATIONS RESPONSIBLE FOR PREPAREDNESS IN HEALTHCARE

8.1 International cooperation

World Health Organisation (WHO)

For decades, WHO has held a central role in surveillance of communicable diseases and coordinating prevention of epidemics. A prime example of the active role of the organisation was its operation as coordinator and issuer of transnational guidelines in prevention of the SARS epidemic. Furthermore, WHO has drafted instructions to improve pandemic preparedness, e.g. by coordinating influenza surveillance through a global laboratory network and by issuing guidelines to member countries for drafting pandemic plans. The 2005 World Health Assembly approved the revised International Health Regulations, effective from 15 June 2007. It obliges member countries to notify cases of disease that may constitute international health risks (e.g. human cases of avian influenza) and to improve their ability to respond immediately to situations that entail potential international danger. The revised Regulations clarify the right of WHO to issue recommendations in the presence of international health risks. In relation to avian influenza, the WHO World Health Assembly decided in May 2006 to bring forward implementation of the revised International Health Regulations to 2006. The responsibility of the WHO Communicable Diseases Cluster is global and the EU Centre for Disease Prevention and Control covers the EU zone, providing assistance to WHO when required.

WHO publishes confirmed case and epidemic notifications on its website, where they are accessible to everyone. WHO may also supply or obtain information bilaterally with member countries, if necessary. If a human case of avian influenza was found in Finland, both WHO and the EU Community Network on Communicable Diseases would immediately be notified. WHO keeps member countries informed, with the pandemic threat possibly rising, of the detailed surveillance and notification procedures required at each alert phase. In a possible influenza pandemic situation, case details would be submitted both to the EU and WHO, both of which develop mutual integrated methods of gathering information.

European Union (EU)

The European Union has developed a surveillance and prevention system of infectious diseases since the 1990s. At the Commission, the work is centralised under DG SANCO, the Directorate General for Health and Consumer Affairs. Authority to act within healthcare systems lies with member countries; consequently, the EU does not have any actual powers with regard to preventive action against communicable diseases either. Nevertheless, member states and the Commission can, if desired, decide on guidelines for preventive measures particularly along the outer borders of member countries and e.g. on policies regarding recommendations and instructions issued to citizens in epidemic situations. The member countries of the Union have a statutory obligation to participate in the operation of the communicable diseases notification and early warning system.

The Finnish healthcare authorities, the Ministry of Social Affairs and Health and the National Public Health Institute, are a part of the EU-wide infectious diseases trace-back and surveillance network launched in 1998. Through the network, the Commission, member countries and the European Centre for Disease Prevention and Control obtain up-to-date information on epidemic outbreaks within the EU zone and, for the most important infec-

tious diseases, also on individual cases. The system is functional and active, and information exchange between member countries and the Commission within the network is almost daily. The network also disseminates information on preventive measures implemented by the countries. In addition, regulations oblige them to notify planned preventive action and to consult with other member countries and the Commission when possible. On the basis of information received and consultations completed, the member countries must coordinate their activities in cooperation with the Commission.

When necessary, the Early Warning Response System, EWRS, of the Community Network on Communicable Diseases disseminates information by email around the clock.

In addition to Internet-based communication and contact, the EU Network on Communicable Diseases may hold telephone conferences, as well as actual meetings of the Network working group on invitation by the Commission. Policies or recommendations regarding control measures may be agreed together, but they are not binding on the member countries under EU regulations. In an influenza pandemic alert situation (WHO phases 3-5) and in a full-blown influenza pandemic, exchange of information and the opportunity of obtaining up-to-date epidemiological information from other EU countries is beneficial to an individual member country, as is information on preventive policies and measures of other countries. In epidemic prevention, diverse systems or resources of different countries may occasion the possibility or a need for policies divergent from other countries. Information will help to avoid confusion and concern among citizens resulting from such differences. It is expedient to strive for uniform policies and recommendations when the policies have a clear scientific foundation, they can be implemented in all member countries, and their execution will improve the chances of preventing the spread of the epidemic.

In spring 2005, the European Centre for Disease Prevention and Control, ECDC, was set up in Stockholm, initially operating solely in the area of infectious diseases. The Centre complements the work of national infectious disease control centres. It endeavours to improve their collaboration and to develop surveillance systems of infectious diseases. One of the tasks of the Centre is to take charge of the EU communicable diseases surveillance and early warning response system. The Centre has already been active, e.g. drafting expert recommendations and setting up its own on-call system.

The working group coordinated by the Commission, the Health Security Committee, has also discussed and exchanged information on pandemic preparedness in member countries, and drafted non-binding documents on the subject as guidelines for preparedness.

The Friends of the Presidency was established in October 2005. It promotes exchange of information, monitors preparatory work necessary for preventing animal and human infections, furthers coordination of the EU's international activities, and reports to Coreper (EU Permanent Representatives Committee).

The EU organised an influenza pandemic preparedness exercise in November 2005, providing experiences upon which to base improvements on the mechanisms of collaboration between the EU countries.

As for influenza pandemic preparedness during Finland's Presidency of the EU, the agenda entry reads that information exchange on pandemic preparedness in the EU countries will continue in cooperation with the EU European Centre for Disease Prevention and Control.

8.2 Pandemic management, authority structure and organisations responsible for preparedness in Finnish healthcare

8.2.1 The Government and governance of a civil crisis

A prerequisite of good management of threats on the population, society and the state is an operational model of crisis management, with which all actors are familiar and practised. As vulnerability of society increases, it is vital that control of emergency situations that have arisen unexpectedly and suddenly can be taken without delay.

The Cabinet Committee on Foreign and Security Policy (CCFSP) has drawn up the principles of the Government's crisis management on 21 April 2006. They are also followed in management of an influenza pandemic.

According to the Government policy decision of 27 November 2003, Strategy for securing the functions vital to society, one of the four focal areas in the next few years in terms of improving performance is health protection, including sudden serious epidemics. The Government is drafting proposals for amendments to current legislation for Parliament. The Government issues decree-level regulations.

Vital functions must be secured under normal conditions, exceptional circumstances and in emergency conditions. Under current legislation, an influenza pandemic does not constitute a state of emergency, but it can probably be classified as an exceptional circumstance. In exceptional circumstances, central government and authorities must take up special measures and concerted cooperation in order to avert the threat and to overcome it. Due to exceptional circumstances, additional resources may possibly need to be deployed, as well as special powers which are included in regulations for normal conditions. Exceptional circumstances may also occasion a need for clarification of the regulations.

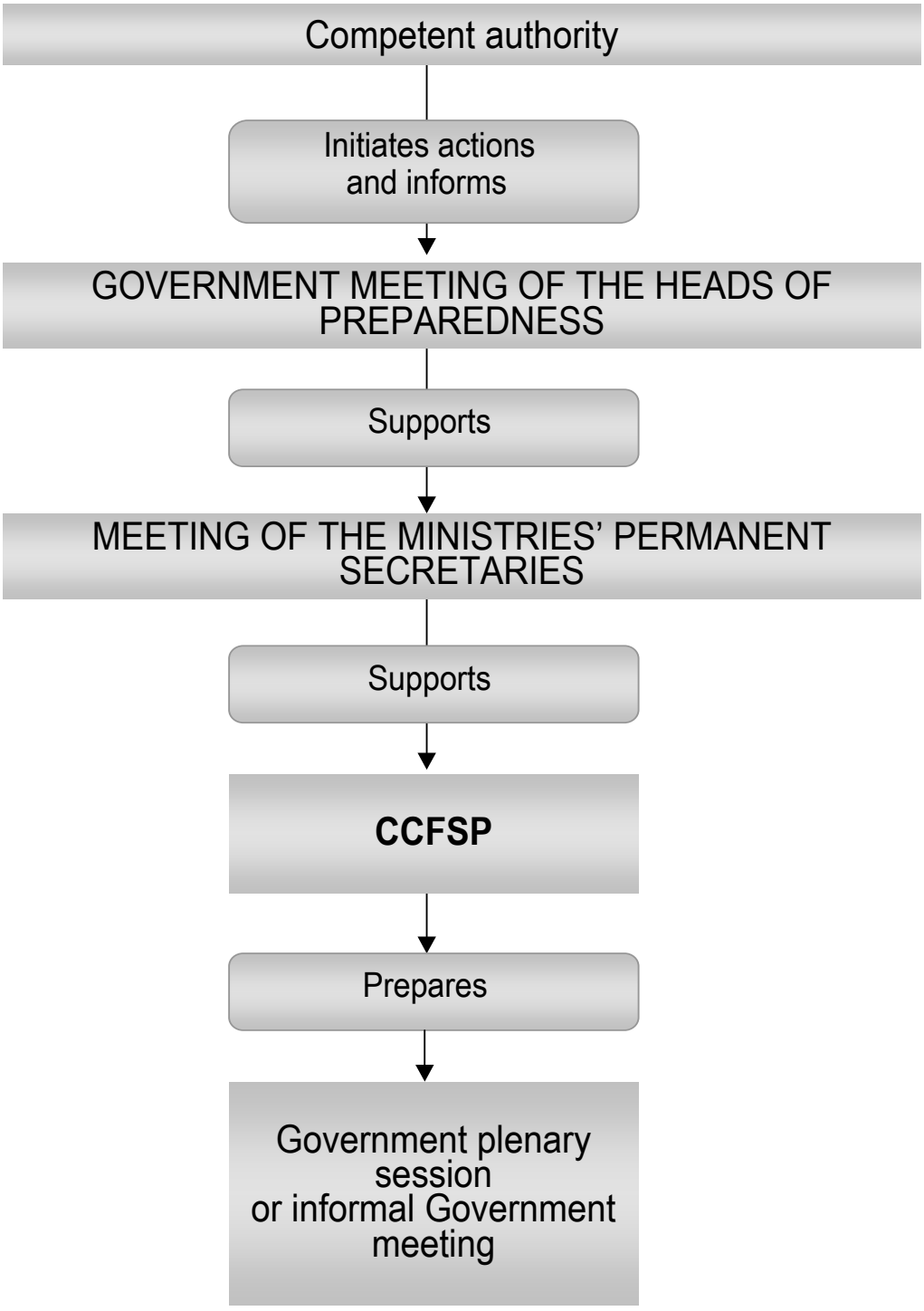
In the Government policy decision, strategic tasks refer to those tasks the execution of which is essential in order to secure vital functions of society in all situations. The point of departure is the current legislation and division of powers among the authorities. Vital functions of society are governance of the state, external ability to function, military defence of the nation, internal security, functioning of the economy and society, security of livelihood of the population, its ability to function, and psychological ability to withstand crises.

Emergency conditions are situations set out in the Emergency Powers Act, control of which is not possible with regulatory powers and resources of authorities. An influenza pandemic is not one of the emergency conditions under the current Emergency Powers Act. One of the means of developing operational preconditions of national governance is a situational picture maintained at the Situation Centre of the Prime Minister's Office. The situational picture enables timely decision-making by national government in order to secure the vital functions of society. The following is an outline of the civil crisis management model, which is included in the revised Strategy for securing the functions vital to society.

Management of civil crises is based on the Constitution of Finland, the Government Act, Government Code of Practice, and other legislation concerning specialist authorities, such as the Communicable Diseases Act. The informal Government meeting discusses coordination of the functions of the administrative sectors and prepares issues for decision by the Government. Under current legislation, operative management is the responsibility of the statutory competent ministry. In the case of a pandemic, it is the Ministry of Social Affairs and Health.

Government level management, operative management and coordination of drafting and hearing of matters in civil crisis situations is based on the duties of the Prime Minister under section 66 of the Constitution of Finland and other legislation.

Levels of coordination in crisis management



CCFSP = Cabinet Committee on Foreign and Security Policy

The Cabinet Committee on Foreign and Security Policy (CCFSP) has drawn up the national crisis management model, constituting the following principal stages and duties:

- The responsible authority initiates the actions in accordance with its instructions and informs the preparedness organisation of its administrative sector of the incident.
- Government level governance is supported by the Government control centre, based on collaboration of the ministries under the leadership of Prime Minister's Office.
- Under the legislation, the competent ministry leads the activities and cooperation of the ministries as necessary.
- Prime Minister's Office ensures that the competent ministry has been appointed.
- The Permanent Secretary of the ministry carries the main responsibility for preparedness of its administrative sector and governance required by the security situation.
- Actions taken by the different administrative sectors and, if necessary, by businesses and civic organisations are coordinated at a meeting of the Ministries' Permanent Secretaries under the leadership of the Permanent Secretary of Prime Minister's Office or Permanent Secretary of the competent ministry.
- In action taken commensurate to the situation, the Government Meeting of the Heads of Preparedness supports the Permanent Secretaries, led by the Permanent Secretary of Prime Minister's Office or the Head of Preparedness of the competent ministry.
- On decision by the Prime Minister or proposal of the competent Minister, the matter is passed in a manner agreed with the Prime Minister for discussion by the informal Government meeting.
- The body in charge of drafting and preparation of Government decisions may be a meeting of the President of the Republic and The Cabinet Committee on Foreign and Security Policy (CCFSP), called by the Prime Minister, or a ministerial committee. The committee is complemented by the competent minister in charge of the situation and any necessary experts.
- Other Cabinet Committees deal with issues in accordance with their mandates.
- Decisions required in order to control the situation are taken by the Government plenary session, the relevant ministry or other competent authority.
- The crisis management model takes into account the obligations placed on member or President countries by the EU emergency and crisis coordination arrangements.
- The above national crisis management model does not affect the status and mandate of the Security and Defence Committee.
- Preparedness and capacity for action of the highest Government authority and the necessary support organisation and systems are maintained through regular exercises.

Meeting of the Ministries' Permanent Secretaries (MMPS) and Government Meeting of the Heads of Preparedness (GMHP)
Operation of the Government, CCFSP and the Prime Minister in governance of civil crises is supported as a cooperative organ under section 10 of the Government Code of Practice by the Meeting of the Ministries' Permanent Secretaries, with the Permanent Secretary of Prime Minister's Office as chair. The Meeting may also be chaired by the Permanent Secretary in charge of the administrative sector of the competent authority responsible for operative management. The Ministries' Heads of Preparedness are Permanent Secretaries of the Ministries or persons appointed by them for this specific task. The Government Meeting of the Heads of Preparedness supports the Meeting of the Ministries' Permanent Secretaries.

8.2.2 Ministry of Social Affairs and Health (MSAH)

The general planning, management and surveillance of protection against infectious diseases is the remit of the Ministry of Social Affairs and Health, which is responsible for the preparedness of social and healthcare services for an influenza pandemic.

All departments and units of MSAH (Health Department, Preparedness Unit, Information and Communications Unit, Department for Occupational Safety and Health, International Affairs Unit, Department for Family and Social Affairs, Finance and Planning Department, and Administrative and Insurance Departments) are involved in pandemic preparedness and overcoming a pandemic situation, each in accordance with its own remit and sphere of responsibility.

In its management operations, the Ministry of Social Affairs and Health engages the support of the National Public Health Institute, which alongside MSAH maintains contacts with international organisations, such as EWRS (European Union Early Warning Response System) and WHO. The National Public Health Institute provides expert guidance to local authorities and the public.

The responsibility for operative management of a pandemic situation lies with the health authorities. They are the responsibility of the Ministry of Social Affairs and Health in cooperation with social and health departments of State Provincial Offices. Operative management involves direction of functioning of the service system, securing of resources and their appropriate direction, obtaining powers and expert services as required by the situation, as well as adequate cooperation with the authorities. For the purposes of operative action, the Ministry maintains a national situational picture and situation management arrangements, a public crisis telephone system, as well as taking care of crisis information and communications and cooperation with EU and other international authorities. The expert services required for operative management are obtained by the Ministry from the National Public Health Institute and other expert bodies. A pandemic situation may require redistribution of resources within an administrative sector.

To support its operative management activities, the Ministry of Social Affairs and Health will set up a national control centre for the administrative sector, if the situation so demands.

At regional and local levels of social and healthcare services, operative management takes place according to guidelines issued by the Ministry.

Establishment of a control centre within the Ministry will not alter the responsibilities of the administrative sector, nor its power relations. The decisions are made in accordance with the Ministry procedure and other statutory powers. The control centre will participate in drafting, presentation and implementation of decisions.

In order to form a situational picture, the control centre is in real-time contact with the Social and Health Departments of State Provincial Offices and the National Public Health Institute, the National Register of Infectious Diseases and the European Union Early Warning Response System (EWRS) of infectious diseases. State Provincial Offices will supply the control centre, in accordance with Ministry directions to be issued separately, with a situational picture of social and healthcare services in their own areas.

The national picture of the social and healthcare services situation is delivered to the situational picture system of Prime Minister's Office. On the basis of the situational picture, the Ministry control centre will direct State Provincial Offices' regional control centres in accordance with the Ministry guidelines.

The control centre manager or a person designated by him reports on the situation daily in a separately agreed manner to ministers, the leadership of the Ministry and the steering group.

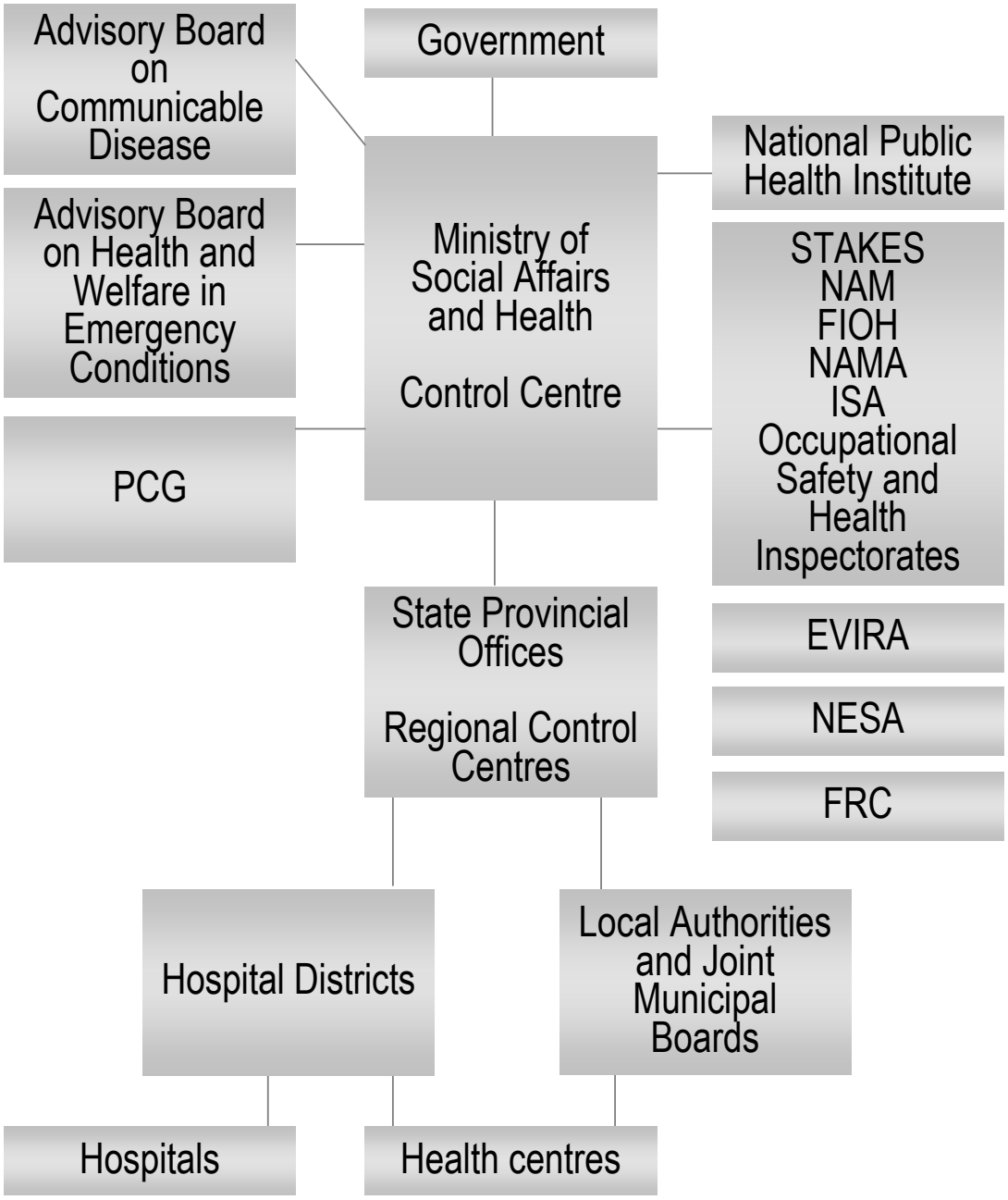
The Ministry steering group appoints the staff of the control centre and defines its working principles. A phase 5 or 6 pandemic situation demands round-the-clock operation of the steering group.

Pandemic Coordination Group (PCG)

When necessary, the Ministry of Social Affairs and Health may appoint a Pandemic Coordination Group. Its remit is to reinforce the operation of social and health services and to prepare matters requiring urgent or multi-sector measures, and the preparation and coordination of which does not fall under the remit of the Government Meeting of the Heads of Preparedness or the Meeting of the Ministries' Permanent Secretaries. Such measures may be e.g. public communications, amendments required to regulations, restricting of mobility of the population (e.g. quarantine arrangements), prioritisation of medical preventive measures with limited availability, stockpiling, reserve stocks, controlled release of reserve stocks, and rationing of materials and equipment. Duties of the Coordination Group also include obtaining international expertise and experience to support national decision-making.

The Pandemic Coordination Group is chaired by a representative from the Ministry of Social Affairs and Health. Members are appointed e.g. from the following organisations: Prime Minister's Office, Ministry of Social Affairs and Health, National Public Health Institute, National Agency for Medicines, Finnish Institute for Occupational Health, National Advisory Board on Health Care Ethics, State Provincial Offices, Hospital Districts, health centres, Association of Finnish Local and Regional Authorities, and representatives from the relevant ministries.

Management of health services in a pandemic situation



STAKES National Research and Development Centre for Welfare and Health
NAM National Agency for Medicines
NAMA National Authority for Medicolegal Affairs
ISA Insurance Supervisory Authority
EVIRA Finnish Food Safety Authority
FIOH Finnish Institute for Occupational Health
NESA National Emergency Supply Agency
FRC Finnish Red Cross
PCG Pandemic Coordination Group

Ministry of Social Affairs and Health Advisory Boards

The Advisory Board on Communicable Diseases and the Advisory Board for Health and Welfare in Emergency Conditions support the work of the Ministry.

The Advisory Board on Communicable Diseases operates within the Ministry of Social Affairs and Health. Its tasks include provision of expert assistance to the Ministry in prevention of exceptional national epidemics.

The Advisory Board for Health and Welfare in Emergency Conditions promotes collaboration between national and international social and healthcare authorities in preparing for exceptional circumstances under normal conditions and for emergency conditions. The Advisory Board has set up four divisions, of which the NBC (Nuclear, Biological, Chemical) Division deals with radiation, biological and chemical threats. Pandemics are biological threats.

8.2.4 Agencies under the Ministry of Social Affairs and Health

National Public Health Institute (NPHI)

As an expert body, the National Public Health Institute supports the work of the Ministry of Social Affairs and Health in drafting a national influenza pandemic preparedness plan. It participates in discussion of issues at the ECDC. The NPHI influenza pandemic working group appointed by the NPHI Director General monitors the epidemiological situation of influenza, if necessary proposing amendments to the national pandemic preparedness plan, making proposals of measures based on the assessment of the situation to MSAH, supports pandemic preparedness of regional and local level healthcare, and supports pandemic preparedness of other administrative sectors.

The National Public Health Institute develops a national case surveillance system appropriate for the pandemic situation, providing information on the rate the epidemic is spreading per health centre and hospital district that is up-to-date and corresponds to the needs of controlling the pandemic situation. In a pandemic situation, the National Public Health Institute is particularly responsible for provision of expert assistance to central government and social and healthcare services, as well as Internet services for social and healthcare actors and the population.

Finnish Institute for Occupational Health (FIOH)

The Institute for Occupational Health acts as expert body in assessing the risk of influenza infection at work and planning and implementation of preventive measures, particularly with regard to occupational healthcare. In cooperation with the occupational health authority and the National Public Health Institute, the Institute for Occupational Health produces instructions for employees on protection from infection, protective equipment required at work and principles of their application, and assesses the kinds of protective equipment and clothing required in each type of work exposing employees to infection. The Institute of Occupational Health, in collaboration with the Ministry of Social Affairs and Health, prepares the duties and operational principles of occupational health and safety in case of a pandemic, in a manner compatible with other healthcare services. The Institute of Occupational Health website contains graphic instructions on use of protective equipment, as well as information on training on its use. The Institute of Occupational Health has prepared directions and training for occupational healthcare services and occupational groups requiring it.

National Agency for Medicines (NAM)
The National Agency for Medicines issues orders and directions to pharmaceutical sector operators on e.g. production methods, manufacture to contract, markings on drug packaging, and deliveries and assignments. The National Agency for Medicines maintains a register of side- effects of medicinal preparations. It is also responsible for implementing obligations under the Act and Decree on reserve stocks and supervision of the stocks. As the competent authority, the National Agency for Medicines is in charge of licensing of manufacture, import, retail distribution and sale of drugs used in influenza pandemic prevention (antiviral drugs and vaccines, reagents required for in vitro diagnostics). In collaboration with the Ministry of Social Affairs and Health, the National Agency for Medicines issues guidelines on operational principles for pharmaceutical manufacturers, wholesalers and pharmacies in a pandemic situation. The National Agency for Medicines, in collaboration with the National Public Health Institute and the Ministry of Social Affairs and Health, will design a system of distributing the drugs to be deployed during a pandemic, and monitoring of consumption and side-effects of antiviral drugs.

The National Authority for Medicolegal Affairs (NAMA)
Under section 6 a of the Communicable Diseases Act (25.7.1986/583), The National Authority for Medicolegal Affairs, under the Ministry of Social Affairs and Health, directs the operation of State Provincial Offices, in order to standardise their operational principles, procedures and solution practices in directing and supervision of combating infectious diseases. In addition, the National Authority for Medicolegal Affairs supervises protective work against infectious diseases especially in cases of: 1) important or wide-ranging matters of principle; 2) issues concerning several provinces or the whole country; 3) issues linked to a matter of supervision concerning a healthcare professional to be handled by the National Authority for Medicolegal Affairs; and 4) issues which the State Provincial Office is disqualified from handling.

NAMA maintains a central register of healthcare professionals (TERHIKKI). It may be used in deployment and implementation of special healthcare occupational obligations possibly demanded by a pandemic situation.

National Research and Development Centre for Welfare and Health (STAKES)

STAKES helps develop information systems to quantify surveillance of the effects of a pandemic, as well as deployment of existing healthcare registers for this purpose. STAKES takes into consideration the needs of a pandemic situation in its development work of healthcare registers and an online patient records system. The Ministry of Social Affairs and Health utilises STAKES know-how of local authority social services preparedness, support of psychosocial services and expert guidance. FinOHTA, which researches and evaluates therapeutic practices, operates within STAKES.

8.2.5 State regional government

State Provincial Office (SPO)
Under the Communicable Diseases Act, State Provincial Offices are obliged to plan, direct and supervise the effort of combating infectious diseases within the territory of the province (section 6, subsection 2). It may issue orders restricting the freedom of the individual and make decisions on the matter (sections 14, 15). The State Provincial Office may order a compulsory health examination (section 13).

In the case of a disease comparable to a communicable disease endangering the public, the State Provincial Office may make the same decisions as in the case of a disease endangering the public.

The State Provincial Office ensures that Hospital Districts and health centres operating within its area draw up an influenza pandemic preparedness plan, as well as coordinating, supervising and directing implementation of the plans with the help of local and national experts and taking into account regional special characteristics.

Under the leadership of the Governor, the State Provincial Office steering group and a preparedness committee, set up in each province by the Governor and representing the different regional administrative sectors, are in charge of general regional management, coordination, surveillance and on-call system of the situation.

If necessary, regional control centres are set up within State Provincial Offices. In a pandemic situation, the responsibility for leadership lies with the Governor and the Social and Health Department. The provincial control centre must include representation of the regional special healthcare, or other steps must be taken to ensure functional collaboration.

Regional control centres carry out intensive situational assessment in support of decision-making by the Governor and the steering group, directing the operation of their regional social and health services in cooperation with the Ministry, maintaining a regional situational picture and delivering it to the Ministry control centre. The Ministry ensures that regional control centres have access to and available sufficient powers, expertise and resources to implement the measures. For its leadership role, the State Provincial Office issues directions on reporting to municipalities.

The Social and Health Department may set up an infectious diseases steering group (pandemic working group), chaired by the Provincial Medical Officer and including at least the officials representing veterinary medicine, health protection and social and healthcare services within the department, as well as medical practitioners responsible for infectious diseases in the Hospital Districts. Reports on the work of the group and the situational picture are submitted by the Social and Health Department to the State Provincial Office Board and the Ministry of Social Affairs and Health.

The mandate of the State Provincial Office is highlighted in management and overcoming of crises. In influenza pandemic prevention, the roles of social and healthcare services, veterinary disease prevention, emergency services, education authority and transport are central.

In a pandemic situation, the Social and Health Department of the State Provincial Office directs the operation of social and health service systems in its area, as well as its adaptation to a changed service requirements situation and collaboration of primary healthcare, social services and special healthcare. Under current legislation, the State Provincial Office does not have the right of binding direction of local authorities.

Occupational Safety and Health Inspectorate (OSHI)

The Occupational Safety and Health Inspectorate ensures that employers comply with occupational health and safety legislation e.g. with reference to exposure to biological factors. The Occupational Safety and Health Inspectorate holds information on the workplaces in its area for each sector. When necessary, the Inspectorate targets surveillance and information on workplaces and occupations where it is possible to contract avian influenza due to conditions in the workplace. If required, the Occupational Safety and Health Inspectorate cooperates with other authorities and expert organisations in e.g. avian influenza risk assessment and in issues related to choice and use of protective equipment at work. The Ministry to-

gether with labour organisations draws up directions for Occupational Safety and Health Inspectorates for taking account of avian influenza and an influenza pandemic in occupational protection surveillance.

8.2.6 Local government

Municipality and health centre (HC)

Municipal self-government gives municipalities and Hospital Districts, owned by municipalities, extensive opportunities of deciding on the organisation of its own operation. Directing of municipal healthcare and powers in organising healthcare services, including in a possible pandemic situation, are laid down by the Primary Health Care Act and the Act on Specialised Medical Care. In the case of infectious diseases, additional account must be taken of the stipulations of the Communicable Diseases Act. The regulations of the Local Government Act must also be noted. As part of primary healthcare, the local authority must maintain health advisory services, organise immunisations under general vaccination programmes, organise medical care of the inhabitants of the municipality, take care of organising ambulance transport, provide occupational healthcare services prescribed to be organised by employers, and organise emergency outpatient services regardless of the patient's place of residence. In order to carry out these functions, a municipality must have a health centre.

Under the Communicable Diseases Act, local authorities must organise the work of infectious diseases prevention in their areas. The Act further identifies the powers and obligations of the municipal organ responsible for infectious diseases.

In municipalities and joint local authorities, the responsibility for operative healthcare management lodges with the chief medical practitioner of the health centre, and the overall responsibility for the whole municipality with the municipal manager. The decision-making does not differ from normal decision-making. The municipality reports on the situation to the State Provincial Office in accordance with directions issued by it.

The health centre draws up a plan in case of an influenza pandemic, including organisation of health centre functions in a pandemic situation, covering direction to treatment, diagnosis and treatment of the disease, as well as organising possible vaccinations. The plan also includes operation of occupational healthcare services organised by the health centre. It must take into account available private sector resources and collaboration with private sector occupational health services. The plan must be drawn up in cooperation with the State Provincial Office and Hospital District regional pandemic working group.

Under healthcare legislation, MSAH, NAMA and the State Provincial Office are responsible for directing, planning and supervision. The municipalities are responsible for organisation of services. In situations where the Emergency Powers Act does not apply, the Ministry of Social Affairs and Health and State Provincial Offices have no powers to order the way municipalities and Hospital Districts organise their services. Nevertheless, the mandate of monitoring the lawfulness of organisation of services supports Government control.

The local authority and service structure reform will have an impact on planning pandemic preparedness by way of increasing regional cooperation of municipalities.

Hospital District (HD)

Under the Communicable Diseases Act, direction of the work of combating infectious diseases within its territory is the duty of the Hospital District, which also acts as regional expert adviser on combating infectious diseases and monitors execution of such work in its

area. The Hospital District assists the municipal organ responsible for combating infectious diseases in diagnosing infectious diseases, identification of epidemics of such diseases, and in trace-back infections. The Hospital District directs prevention, surveillance and investigation of hospital infections in its area.

In addition to the duties indicated in the Communicable Diseases Act, as obligations under the same Act the Hospital District must: - ensure that special medical services required for treatment of infectious diseases are available within the Hospital District area; organise the necessary education and training for combating infectious diseases within the Hospital District; participate in development of measures to combat infectious diseases within the Hospital District; provide, on demand, summary details of notified infectious diseases registered in the health centre catchment area, taking account of the restrictions on disclosure of information under section 10 subsection 3 of the Communicable Diseases Decree; undertake regional dissemination of information on infectious diseases to healthcare professionals.

The remit of the State Provincial Offices is to coordinate the plans of Hospital Districts and to ensure that the latter collaborate with their area primary healthcare and social services in drawing up an influenza pandemic preparedness plan. The plan must also take into consideration private sector and occupational healthcare resources available in the area. The Hospital District acts as the regional expert adviser on influenza pandemic preparedness.

Appendix 5 sets out the areas of responsibility and decision-making of different organisations and administrative levels at the various phases of pandemic alert and full-blown pandemic.

9 ETHICAL CONSIDERATIONS IN PREVENTION OF PANDEMICS

As an influenza virus infection affects an individual, it always affects also the surrounding community. Preventive measures, treatments or lack of them directed at an individual may affect the health of other community members. In accordance with the principle of equality, everyone permanently living in Finland must have an equal right to protection by vaccinations and treatment of the disease, once it has erupted. If, however, due to practical reasons the best prevention or treatment is not sufficiently available for everybody, we need to consider priority setting principles that withstand ethical scrutiny. In measures directed at alleviation of impacts of the pandemic, conflict between basic individual rights and benefits to the community may also arise. Therefore it is important to evaluate the ethical aspects of planned measures in advance.

9.1 Values and principles affecting decision-making

During a pandemic, decision-makers and those responsible for healthcare may be forced to make difficult decisions affecting the health and freedom of action of their citizens. These decisions must be grounded on jointly defined values. The Ministry of Social Affairs and Health proposes the following values as bases of decision-making. Balanced reconciliation of these values is important, albeit not easy.

Individual liberty
It may be necessary to restrict individual liberty at the threat of or during a serious epidemic. Possible restrictions must not be exaggerated in relation to the impending danger, and they must be equally applied to all whose liberties it is deemed necessary to restrict in order to protect the community.

Equity (egalitarian approach)
Equal right of everyone to preventive healthcare and treatment is an integral part of the Finnish and Nordic value system. Nevertheless, even under normal conditions various treatments and target groups must be placed in order of urgency and priority. In a pandemic situation the need for prioritisation is emphasised. It is also possible that quick decisions are required, if a means of protection (e.g. vaccine) is not available in sufficient quantity for everyone.

Utility maximisation (utilitarian approach)
Utility maximisation aims at the maximum possible good for as many as possible.

Efficiency
Efficient and appropriate use of resources is extremely important in a situation where resources are limited.

Transparency
Values and principles as the basis of decision-making, and its implementation, must be easily accessible to all concerned.

Reasonability of the decisions
The decisions must be clearly reasoned and based on best available information on the threat, as well as on previously accepted values and principles.

Reciprocity
The principle of reciprocity presupposes that society will support and protect especially those who bear a considerably greater than average burden in order to safeguard the common good.

9.2 Fundamental ethical issues

9.2.1 Duty of healthcare personnel to provide treatment

Treatment of influenza patients may cause a risk of infection for the healthcare personnel giving treatment. The Act on Health Care Professionals and general ethical regulations (codes of ethics) oblige to administer immediate assistance to the seriously ill in all situations. The Occupational Safety and Health Act obliges the employer to take all necessary precautions in order to minimise any health risks arising at work.

For decades, there has been no need to reconcile the duty of healthcare personnel to provide care and their right to protect their own health in situations where the duty to provide care would have placed their own health at serious risk. However, the matter has been discussed e.g. in connection with the global SARS epidemic of 2003, when three cases fulfilling the WHO criteria of likely cases of SARS were identified. If the number of those infected during the pandemic is very large, application of maximal protective measures sure to prevent infection will not be possible at every patient contact. Nevertheless, treatment of patients cannot be abandoned. Even if mortality of infected people of working age might be very small, conflicting ideas about transmissibility of the infection, severity of the disease and adequate preventive measures may arise.

Those responsible for healthcare must ensure safe working conditions for staff by training and by ensuring that units have adequate supplies of structures and equipment needed in protection. Ethical guidelines for healthcare personnel should define in more detail how great a personal risk may be expected of healthcare professionals. They should also define the practical meaning of their duty of not harming patients and colleagues by spreading the disease, as well as when they may be obliged to use all available precautionary measures.

9.2.2 Just distribution of limited resources

In distribution of healthcare personnel work, treatment units, vaccines and antiviral medication, the aim should be equality on one hand, and the maximum possible health benefit on the other hand. Taking both into consideration, it must further be decided what kind of health benefits are sought.

A frequently mentioned aim is prevention of adverse health effects (infection, hospitalisation, deaths). However, adverse health effects are not of equal value, and different measures may have different capacities in preventing various health effects. Every influenza pandemic in the 1900s has been characterised by increase of deaths extending to younger age

groups. The intensity of this phenomenon has varied a lot, and can thus be ascertained only once the pandemic or the preceding alert phase of local epidemics has been ongoing for some time.

Saving of expected years of life is based on prevention of deaths, and is a more unambiguous goal than the above. This approach considers protection of children from mortal danger more valuable than that of old people, which some may see as setting the young and old in an unequal position. On the other hand, ignoring remaining life span would also lead to considering an aged person's year of life more valuable than that of a child.

By talking about *quality-adjusted life years*, we mean that the estimated remaining life span of the individual or group of persons in question is assessed for value. This model of thinking emphasises prevention of the death of a previously healthy child in relation to e.g. an elderly person perhaps already affected by a serious chronic illness, and with the number of remaining years of life in any case clearly lower. However, evaluation of quality of life is not unambiguous, and application of this model may also be felt to be unjust.

In aiming to *save productive quality-adjusted life years*, one quality criterion, social added value, is taken into consideration in evaluating likely remaining years of life. In addition to supposed work input ('taxpaying capacity'), many immaterial products (e.g. art) affect functioning of society and wellbeing of the population. Their impact is difficult to quantify and predict.

As well as maximising equality and health benefits, the principle of reciprocity must be taken into consideration when distributing limited resources. While the staff is expected to have an especially large input in taking care of infected patients, and even subject themselves to dangerous infection, they must be given priority in distributing all means of protection.

After the objective of alleviating the impacts of a pandemic has been chosen, the means most likely to reach the objective must be assessed. If resources are limited, a decision must be made on the order of targeting the preventive measures on different population groups.

Finland has signed supply contracts for two different types of vaccine for the whole population. Should delivery of the vaccines be partially delayed, the decision must be made as to who should receive the first batches, and who should wait for the remaining deliveries. Finland has obtained 1.3 million courses of the antiviral drug oseltamivir, sufficient for treatment of a quarter of the population. In principle, it can also be used as post-exposure short-term prophylaxis or long-term preventive drug treatment, in addition to treatment of the infected. If the population morbidity percentage of a future pandemic rises above 25 percent, there are no longer sufficient drug supplies for all, and their use must be prioritised. Similarly, if it were decided to use the drug as long-term preventive treatment of considerable population groups, a proportionally smaller share would be left for treatment of the infected.

The National Advisory Board on Health Care Ethics (NABHCE) has discussed at its meetings the principles of using vaccines and antiviral drugs. According to the opinion of the Advisory Board, the Ministry of Social Affairs and Health proposes that the primary aim of measures to prevent a pandemic should be prevention of adverse health effects and saving of years of life. Their emphasis on targeting of inoculations, use of antiviral drugs and other preventive measures is explained in detail elsewhere (sections 7.1, 10.6.1 and 10.7) The crucial point is that effective efforts are made to halt infection chains created in pandemic alert phases 3-5 through measures to isolate and protect those exposed, and through targeted prophylaxis (see section 10.2). Once the pandemic is under way, the emphasis is on caring for the infected and protecting exposed healthcare personnel. (section 10 *Obligations and operation of the healthcare system*). In healthcare and elsewhere in society, efforts to prevent

the spread of infection are made through means other than those based on the use of vaccines and antiviral drugs (section 7.1 *Slowing down the spread of infection* and section 10.4 *Protection against infection in healthcare*).

Long-term prophylaxis of "groups vital for functionality of society", or giving them priority in administering vaccinations is not justified. Identification of the groups is difficult in many areas, and is likely to cause feelings of injustice in the population. Continuity of functions must be ensured by other means. In the case of vaccinations, personnel caring for infected patients are an exception.

The extreme burdening of healthcare brought about by the pandemic will unavoidably reduce availability of healthcare services for treatment of other than influenza patients. Regional and primary healthcare preparedness planning must take into consideration in relation to each problem and disease group, how serious the impacts will be on rescheduling non-emergency preventive services and those for chronic diseases. The planning should identify alternative methods of treatment, through which the difficulties caused by reduction of these services might be minimised.

9.2.3 Justification of emergency measures

Restriction of individual liberty in order to prevent an epidemic

Measures impinging on individual liberty and protection of property are rare exceptions in healthcare legislation, and their application is regulated in great detail. The Communicable Diseases Act and Communicable Diseases Decree define the responsibilities and duties of various parties in surveillance and prevention of infectious diseases, as well as the situations in which an individual's inviolability, freedom of movement or property may be compromised in order to prevent infection. The municipal agency (usually the health committee) responsible for prevention of communicable diseases may order an infected person or one suspected of being infected to absent himself from work, an educational institution or daycare. It has the option of ordering a person to be isolated in a hospital, if the risk of the disease spreading is apparent, and if there is no other way of preventing the spread of the disease. At the place of isolation, a person suffering from an infectious disease involving danger to the general public may be administered treatment necessary for prevention of the spread of the disease, even regardless of his wishes. An amendment to the Communicable Diseases Act concerning quarantine has been passed by Parliament.

Under the Communicable Diseases Act, a general programme of vaccination is voluntary to the individual. However, the Government may separately decide on mandatory inoculations to prevent the spread of such an infectious disease as may have considerable adverse effects on the health of the population or a part of it. It is unlikely that mandatory inoculations would be necessary in a pandemic situation.

Accelerated adoption of new vaccines and drugs

Vaccines used in a pandemic may have to be widely used before the safety studies normally required of influenza vaccines have been completed. Accelerated adoption of a new antiviral drug or drug variant is also a possibility during a pandemic. Influenza vaccines and antiviral drugs are usually well tolerated. Pandemic vaccines are unlikely to be significantly different from similar seasonal influenza vaccines, or possible new antiviral drugs from those already in established use. Therefore, application of these preventive methods to reduce health risks caused by a pandemic can be deemed to be ethically acceptable.

10 OBLIGATIONS AND OPERATION OF THE HEALTHCARE SYSTEM

10.1 Detection of cases and epidemics

10.1.1 Objectives and method of surveillance

Surveillance is one of the cornerstones of pandemic preparedness. The main objectives of surveillance are (1) detection as early as possible of the arrival in Finland of a virus causing a pandemic threat or a pandemic virus, and (2) description of incidence, severity and spread of a disease caused by an influenza virus or causing a threat.

During the pandemic alert phase and the pandemic, surveillance includes (1) epidemiological surveillance of incidences; (2) virological laboratory surveillance; (3) surveillance of antiviral drug and vaccine usage; (4) surveillance of adverse side-effects of the above and (5) surveillance of veterinary diseases. Surveillance of 3, 4 and 5 will be addressed in other sections of the Pandemic Plan. Prerequisites of surveillance are well-functioning information gathering and processing systems, collaboration between laboratories and with parties involved in epidemiological information gathering.

During pandemic alert phases 3-5, surveillance must be sensitive in order to detect suspected cases, the laboratory testing (see section 10.1.3) of which will confirm or eliminate an influenza virus infection causing a pandemic threat.

At pandemic phase 6, the aim of surveillance is to detect the start of regional epidemics, to describe the course and end of the epidemic in each area, and to direct detection of cases, use of different preventive methods (section 7) and assessment of their efficacy.

Particular objectives of surveillance include detection of changes in transmission mechanisms of an influenza virus causing a pandemic threat or a pandemic, in the clinical description (complications, deaths), in distribution of the cases across age or medical risk groups, possible protecting factors, and to quantify the burdening on healthcare services caused by influenza. Properties of influenza virus strains identified through surveillance are compared to the structure of available vaccines, and sensitivity of the virus strains to antiviral drugs established.

Due to the divergent objectives at the different phases of pandemic alert and full-blown pandemic described above and to the extensiveness of the operation, surveillance methods applied are also different at different phases. National and international influenza surveillance during WHO phases 1–2 is described in sections 4.5.2 and 4.5.3.

10.1.2 Clinical assessment and confirmation of cases

Case assessments are used to direct e.g. use of diagnostics of a virus causing a pandemic threat in incidences of disease, to denote the degree of certainty of the diagnosis at various stages of an investigation into a case, to standardise information gathering on incidences, and to enable quality clinical-epidemiological research during the different phases of pandemic alert and full-blown pandemic. Use of laboratory diagnostics is described in section 10.1.3.

The surveillance case definition may include a section concerning symptoms and clinical findings, one on exposure and one on laboratory confirmation. At pandemic alert phases 3-5, crucial sections are the one on exposure containing a frequently geographically delimiting definition (e.g. “countries where A/H5N1 influenza is found in birds”), a description of

the exposure situation causing the actual infection risk (e.g. “direct personal contact”, “less than 1 metre from confirmed case of influenza”), and an assessment of timing of the exposure (e.g. “at most 7 days before first symptoms”). The definitions change when epidemiological information or that concerning properties of the virus changes. When the influenza virus subtype causing a risk of a pandemic changes, the directions are updated. Precise up-to-date definitions may be found on the NPHI website[13].

At pandemic alert phases 3-5, laboratory confirmation is always required. During the pandemic proper, the number of cases does not permit systematic laboratory confirmation. However, in order to monitor possible changes in the properties of the pandemic virus, specimens are collected from a sample of suspected cases under a separate plan. At the peak of a pandemic wave, a very large proportion of all feverish respiratory tract infections are caused by influenza, which is why a simple case definition based on symptoms is sufficient both as surveillance tool and as basis for treatment decisions.

As the pandemic alert progresses, WHO and ECDC issue recommendations on international standardisation of surveillance case definitions.

In terms of patient care, the grounds for starting antiviral drug treatment differ from the surveillance case definition during pandemic alert phases 3-5. During the current alert phase 3 caused by the influenza A/H5N1 virus, initiation of treatment is based on the present direction for early identification of an A/H5N1 infection in humans and risk assessment carried out on this basis. The direction is constantly updated on the basis of epidemiological information and that accumulated on special characteristics of the disease and diagnostics during alert phases 3-5. Up-to-date directions may be found on the NPHI website[6].

At pandemic phase 6, the surveillance case definition is based on the simple combination of symptoms typical of influenza. The aim is that the surveillance case definition and the grounds for starting antiviral drug treatment should be as compatible as possible. The case definition consists of influenza-like symptoms, which in ordinary seasonal influenza include especially a high temperature (>38ºC), respiratory tract symptoms and muscle aches. Based on information accumulated at a late alert phase (phase 5) on the clinical description caused by the pandemic influenza virus, a final, detailed case definition will be drawn up, to act both as surveillance tool and grounds for starting antiviral drug treatment.

10.1.3 Using viral diagnostics

Only laboratory tests can provide confirmation of a case of influenza, particularly an infection by an influenza virus causing a pandemic alert or an actual pandemic. In addition, laboratory activities are used to monitor the possibly changing properties of the virus. During the different phases of a pandemic alert and full-blown pandemic, the objectives and methods of laboratory activity vary.

During pandemic alert phases 3-5, halting or at least slowing down the development of a pandemic is the key objective. Then it is important that every single new case or cluster caused by the influenza virus is quickly identified, so that potential infection chains may be broken. Specimens must also be examined for other possible pathogens, in order to avoid unnecessary costly isolation and other further measures.

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[6] www.ktl.fi -Terveyden ammattilaisille

At phase 6 the case numbers are so large that diagnostics of individual cases are neither feasible nor justified. At that phase, too, investigations by virus laboratories are needed for testing of separately defined samples, for example for surveillance of development of a potential drug resistance.

Analytical methods

To identify a virus from respiratory tract secretion samples, laboratories use viral culture, antigen tests or polymerase chain reaction (PCR) methods. Viral culture may be used to isolate the virus strain for further analysis. These are carried out to identify the virus type (e.g. influenza A) and subtype (e.g. H5N1). Through genetic analysis of isolated viruses, mutation of the virus is monitored and the resistance of the virus to medications may be determined. The downside of viral culture is the slowness of the method. It may take several days – sometimes even weeks – for the virus to multiply to such a degree that it can be characterised. Antigen tests produce results considerably faster, even in 20 minutes. These tests identify structural components of the virus, but they do not distinguish influenza A virus subtypes from one another. Therefore, express tests employed in seasonal influenza diagnostics should not be used as the sole method when suspecting a pandemic virus, since both positive and negative results might be misleading. PCR is also a great deal quicker than viral culture. New specific reagents can be quickly developed for it as the virus to be identified mutates. The other side of the coin is that there are a number of different PCR versions available, the sensitivity and specificity of which at the present phase of pandemic development may be uncertain. National and international coordination is essential for viral findings results obtained by PCR methods to be reliable and comparable.

Antibody tests carried out on blood samples can be used later to show whether the patient has contracted a certain virus, whether vaccination has brought about an immune response, and whether the patient has immunity against a certain virus. Testing by traditional antibody identification methods, the haemagglutination inhibition test (HI) and neutralisation test require using live virus and thus a BSL3 laboratory. EIA methods do nor need live virus and they would be possible also in customary virus laboratories. In early 2006, there is no EIA method available that could specifically quantify H5N1 antibodies.

Specimens

Precision and reliability of laboratory diagnostics is largely dependent on patient specimens taken correctly and at the right moment. To identify a virus, the specimen is taken as early as possible in the course of the disease, usually using a cotton wool or dacron wand from the pharynx and nostrils, or with a suction device from the epipharynx. Detailed specimen-taking instructions are on the NPHI website. For antibody testing, paired serum specimens are collected. The first specimen is taken at the acute stage of the disease and the second 10-14 days later. If necessary, a third specimen may be taken about four weeks from the onset of the illness.

Before taking specimens it must be ensured, especially at pandemic alert phases 3-5, that the laboratory has the appropriate resources for examining the specimens. The specimens are packed in a refrigerated container and delivered to the laboratory by emergency transport as quickly as possible. If transport is delayed, the specimen is kept in a refrigerator. More detailed instructions may be found on the NPHI website (www.ktl.fi -Terveyden ammattilaisille).

Using virological laboratory tests at different phases of pandemic development

WHO pandemic alert phases 3-5

Viral diagnostics are required if the suspected influenza patient may have contracted the virus causing pandemic threat from a diseased animal (phases 3-5) or human outside Finland (phases 4-5). Current instructions on confirming suspicions of an avian-based infection caused by the A/H5N1 virus are on the NPHI website. If one of the phase 5 local human infection clusters occurs in Finland, phase 6 procedures will be adopted.

Intensive and extensive microbiological diagnostics should be used on every patient suspected of contracting a disease caused by a pandemic threat virus. At least during phase 3, taking specimens should be preceded by consultation with a medical practitioner specialising in infectious diseases as indicated in separate guidelines (more detailed instructions on NPHI website). A positive result leads to measures that are taxing for the relevant healthcare unit, and possibly restrict the freedom of movement of the patient and his close contacts. Similarly, a negative result generally halts the measures initiated just in case. This sets special demands on the reliability of the results. An incorrect result either way hinders the measures required in order to break an infection chain possibly under way. At the same time, it is important to endeavour to identify some other possible pathogen in the patient. Although double infections are a possibility, discovery of some other pathogen is an extremely important piece of information in planning further steps.

Identification of the virus is the primary principle of diagnosis, but particularly if taking specimens is delayed for some reason or another, antibody definitions are also important.

Because viral culture is important at this stage, examination of the specimens should be concentrated in laboratories where the culture can be implemented under biosafety level 3 (BSL-3) conditions. In early 2006, of laboratories engaged in extensive viral diagnostics, only HUSLAB had such facilities. Detailed specimen-taking and dispatching instructions are on the NPHI website (www.ktl.fi -Terveyden ammattilaisille)[6].

The instructions may change with increased knowledge and progression of pandemic development phases. Therefore, the latest directions should always be checked on the NPHI website.

The number of patient specimens to be examined may increase in fits and starts during pandemic alert phases. Therefore, preparations should be made in time for carrying out screening for both the virus causing a pandemic alert and alternative pathogens also in normal virus laboratories under biosafety level 2 (BSL-2) conditions (e.g. PCR). The National Public Health Institute (NPHI) monitors development of the alert situation, and when necessary, issues instructions and recommendations on the use of new diagnostic methods on its website and through other channels.

NPHI monitors mutation and drug sensitivity of possible isolated influenza virus strains causing a pandemic threat, keeping as up-to-date as possible. This knowledge is utilised in an effort to optimise measures to prevent creation of potential infection chains.

WHO phase 6 (pandemic)

During phase 6 (and possible already at phase 5, if human-to-human transmissions are occurring as an epidemic in Finland), the objective is no longer identification of the cause of an individual patient's illness, except at the early stage, when the spread of the disease across different regions in Finland is best monitored on the basis of laboratory-confirmed cases. Even on the outbreak of a local epidemic, the high case numbers render comprehensive di-

agnostics impossible, and after the cause of the epidemic is confirmed, also unnecessary.

However, possible mutation of the virus in terms of its antigenic properties and drug sensitivity should be monitored also during the pandemic. Samples are collected in accordance with a separately established plan and delivered to the National Public Health Institute influenza laboratory for further analysis.

10.1.4 Surveillance information gathering

Surveillance information gathering is based on the surveillance system under normal conditions (section 4.5) and on the system adopted in stages, taking into consideration the information requirements of the pandemic alert phase or the pandemic.

WHO phases 3-5

Under normal conditions, all microbiology laboratories notify laboratory-confirmed cases of influenza to the National Register of Infectious Diseases. As the pandemic alert phase progresses, information gathering can be quickly extended to cover required additional information on the virus causing the threat. When there is a suspicion of an influenza viral infection causing a pandemic threat, the final result of the laboratory test is always confirmed by the NPHI national reference laboratory which submits details of the confirmation to the Register of Infectious Diseases, where the information is collated with that notified by other sources.

The unit treating the patient (including private services) submits a notification by telephone of each suspected and confirmed case of pandemic alert virus infection, as early as possible, to the medical practitioner responsible for infectious diseases within the Hospital District and to the National Public Health Institute (more detailed instructions on NPHI website[6]). The National Public Health Institute participates in case-by-case assessment, establishing at the suspicion stage the probability of the diagnosis and the extent of preventive measures.

On every suspected and confirmed case of pandemic threat viral infection, the National Public Health Institute systematically collects information on the disease, exposure and the outcome. The information is primarily collected by the medical practitioner responsible for infectious diseases within the Hospital District or a person appointed by him or her. While the case numbers are very low, the information is collected by telephone and a dedicated form issued by NPHI, transmitted by fax. The functions of the National Register of Infectious Diseases may be technically improved in that as the case numbers increase, the treating doctor or the medical practitioner responsible for infectious diseases within the Hospital District can submit electronically the necessary systematic surveillance information (e.g. exposure details, symptoms, referral to hospital, antiviral medication, inoculation history). This way, the information would be immediately available to everyone involved in preventive work through the remote user system of the Register of Infectious Diseases.

If regional epidemics or clusters occur in Finland at pandemic alert phases 4-5, early epidemic detection methods will also include surveillance of reasons for outpatient visits for infectious diseases, currently under development. Surveillance of reasons for outpatient visits for infectious diseases aims to develop a procedure in cooperation with health centres, emergency clinics and parties responsible for the technical structure of patient record systems, which would allow for automated collection of information of simple content from lo-

cal patient record systems for a national data system, to aid detection of infectious disease epidemics. The doctor or nurse responsible for the treatment event does not need to take any other measures in addition to entering normal records into the system. In order to function extensively, the system demands more comprehensive use of reason-for-visit codes in primary healthcare. The information collected by the system would permit its transmission through online technology for use by local, regional and national healthcare authorities. The intention is to extend the system to become a central sentinel surveillance system covering a significant part of public primary healthcare and emergency rooms. In its extensive coverage mode, the system provides an accurate picture of public healthcare burdening brought about by influenza.

WHO phase 6

MSAH declares a pandemic (phase 6) as under way in Finland (section 8.2), signalling transition to the procedure described below.

Due to the large number of patients, the influenza diagnosis for the majority is no longer based on laboratory testing, but a simple diagnosis based on symptoms (section 10.1.2).

The functions of the National Register of Infectious Diseases (www.ktl.fi/ttr) are developed in such a way that doctors and, if necessary, persons authorised by them (nurses, community nurses) can submit online notifications of influenza cases to the Register at the time of the treatment event. By adding the possibility of online recording of influenza to patient visit information systems, through partial automation of information content creation, notification can be made to consume very little extra time. Should it be deemed appropriate, it is possible to include additional fields on e.g. administration of antiviral drugs and referral to hospital. Thus, the patient record system produces the notification of infectious disease, the information content is supplemented, if necessary, in a way demanded by pandemic surveillance, and the information system sends a notification to the National Register of Infectious Diseases.

For healthcare units that do not have the necessary online notification structures in their information systems, an Internet-based notification procedure will be developed, whereby the information is recorded direct in the database of the National Register of Infectious Diseases.

Through the above procedures, up-to-date information on treatment events would be quickly available to everyone involved in preventive work through the remote user system of the National Register of Infectious Diseases. Using this solution, they would also be quickly available for the public online statistical service provided by the National Register of Infectious Diseases (www.ktl.fi/ttr).

The automated surveillance of reasons for outpatient visits for infectious diseases, described above in the context of measures during pandemic alert phases 3-5, helps early detection of the eruption of a regional epidemic. On this basis, regional and national communications and training may be improved.

Some of the above-mentioned modifications to information systems can be effected quickly as the pandemic alert phase progresses. The extent of available resources determines the schedule of progress of the actual development projects. While the above-mentioned integrated, automated systems are under development, information gathering may be for a short time implemented through a form delivered by fax. The information would be most expediently recorded regionally, and the system would be most rapidly created centrally. This kind of a separate notification procedure is more time-consuming for medical personnel than integrated procedures, which would be a significant problem while health-

care services are under great pressure. Furthermore, the information would not be as readily available for use by parties involved in prevention as when already existing surveillance information systems are modified to suit the purpose, with utilisation procedures that are versatile and well-established.

Based on the severity of the pandemic, the grounds are established for drug treatment of those affected (in detail in section 10.7). If the aim is to treat everyone contracting influenza at an early stage (<48 h from onset of first symptoms) with an antiviral drug, it is possible to integrate in surveillance the information of whether antiviral treatment was started, as well as other simple details required for directing preventive work. If surveillance of antiviral drug use is linked to case surveillance in information systems, the information produced by the system could direct deliveries of antiviral drugs.

By entering in the National Register of Infectious Diseases the information on each case on possible death, obtained through normal methods using the ID code from the population registration system, the system may, with a small delay, provide information on case mortality rates.

In seasonal influenza surveillance, absence surveillance of daycare centres, pre-schools, educational institutions, workplaces and the armed forces is often used. Design and organisation of such extensive surveillance nationally and with uniform procedures would require more resources than are currently available. Nevertheless, in regional terms, absence surveillance could be used to complement that based on use of healthcare services to clarify the picture of the impacts of a pandemic. Systematic absence surveillance is especially important in organisations that are pivotal in securing vital functions.

Development of the information systems, as outlined above, demands well-coordinated collaboration among parties responsible for healthcare information systems and surveillance systems. As numbers of suspected or confirmed cases grow during pandemic alert phases or particularly the full-blown pandemic, technological systems require much greater line, memory and processing capacities set aside for this purpose than are currently available, in order to function reliably and to provide effective support for control operations.

In terms of implementation of the plans for both pandemic alert phases 3-5 and the actual pandemic (phase 6), it is crucial that the systems they are based on are in routine use. The various actors involved in surveillance are given obligatory directions, and decisions are made regarding development measures. The intensive methods of gathering and utilising information of the pandemic alert phase demand separate development resources, if they are to be available in the near future.

10.2 Measures targeted at those exposed

A person exposed to a suspected or confirmed case of influenza is at risk of contracting influenza. With some people affected, the influenza infection may remain symptom-free, with some it may cause mild illness which the infected patient does not recognise as influenza, and with some of those infected, influenza with a typical clinical description will develop.

In all the infection situations described above, the person may pass on the influenza virus in his respiratory tract secretions. With those affected with symptoms, the virus may be found in respiratory tract secretions before the first symptoms appear (see sections 4.1.1 and 10.4).

The aim of measures targeted at those exposed is to reduce the risk of the person infected through exposure passing it on to others before his symptoms appear, or before the illness is diagnosed as influenza.

No effort will be made to identify those exposed during the pandemic (phase 6), and no particular measures will be targeted at them. The procedures described below apply to pandemic alert phases 3-5.

10.2.1 Definitions of exposure and an exposed person

Transmission mechanisms and transmissibility of influenza are described in section 4.1.

People exposed to a case of influenza (case definition in section 10.1.2) are (1) those living in the same household; (2) persons who have been in direct contact with the patient or exposed at a maximum distance of one metre to the patient's respiratory tract secretions, spread in droplets by coughing, sneezing, nose-blowing and talking; (3) medical staff exposed in the manner described above while caring for the patient in hospital without appropriate protection (see section 10.4 *Protection against infection in healthcare*). N.B.! People who have used appropriate protection have not become exposed.

10.2.2 Tracing

The objective of tracing is to find those exposed before they can spread the disease further. The exposed are advised to recognise the symptoms of possible influenza as soon as they occur and to avoid behaviour that might spread the infection before the symptoms appear. Through trace-back, a case of influenza that has become symptomatic may be recognised early, before the person has realised that he has influenza, and isolation measures immediately implemented to prevent further infection, and treatment begun as early as possible. Monitoring of those exposed can also help collect information on the efficacy of implemented precautionary measures.

Tracing is initiated when a suspicion of exposure to a virus causing a pandemic risk arises. Because the incubation period (see section 4.1.1) of influenza is short, trace-back is commenced as quickly and efficiently as possible. While the source of the exposure is still lacking laboratory confirmation, the party locally or regionally responsible for epidemiological investigation should contact the National Public Health Institute as soon as possible, for risk assessment and determination of the extent of the measures to be taken.

Trace-back is a task for the experts, requiring training on infectious diseases and special features of tracing. The patient, close family or people living in the same household, colleagues, staff of the healthcare units that have treated the patient, passenger and seat lists of public transport etc. are used as sources of information. Often, numerous sources of information result in a list of exposed contacts, with details for each person on the nature of the immediate exposure.

Detailed information on each exposure situation is collected, which may either increase or reduce the risk of infection in the situation in question. It is particularly important to include information on possible protection from infection in the exposure situation, or of prior vaccination against the relevant microbe.

Tracing demands wide-ranging collaboration between healthcare units. If the exposure has taken place on international transport (e.g. airplane, ship), tracing requires passing on the

information to one or more national health authority, as well as to international organisations (WHO, ECDC) that may be coordinating the investigation.

10.2.3 Advising and monitoring the exposed

The exposed person is advised to follow diligent hand hygiene and to avoid close contact with other people during the remaining potential incubation period of the disease (see section 7.1 *Slowing down the spread of infection*). The symptoms that might accompany the onset of influenza and the measures to be taken when the first symptoms appear are carefully explained to the exposed person. The goal is to have available a local or regional telephone helpline which the exposed person can call when the first symptoms appear, to be given detailed instructions on action to be taken thereafter.

A pandemic alert phase may require active monitoring of the exposed without setting up quarantine. The unit carrying out active monitoring is in daily contact with the exposed, enquiring whether he is running a high temperature, cough or shortness of breath, muscle pains, headache, fatigue, sore throat, a runny nose, nausea, vomiting or diarrhoea. The onset of symptoms is followed by direction to a regionally appointed healthcare unit for diagnostics and treatment.

10.2.4 Quarantine

Quarantine means restricting the movements of a person who has been exposed to infection but is free of symptoms, to prevent him from passing on the microbe to others as the infection develops. Quarantine is started at the earliest point when the person may be contagious, and it ends when the longest known incubation period, during which the symptoms should appear, has passed since the last exposure. The maximum incubation period of normal seasonal influenza is six days, but the incubation period of a new pandemic virus may be different. The incubation period is determined at the pandemic alert phase according to best available knowledge.

Quarantine is always a part of a prevention programme, where other methods likely to be effective in controlling the infection in question are also employed in an effort to prevent an epidemic. Most commonly, quarantine is implemented at home by voluntary agreement. Under exceptional circumstances, quarantine in an institution may also be an option. Only in emergency situations is it justified to impose quarantine against the will of the person being quarantined (for points of law, see section 14 Legislation).

If possible, a healthcare unit should be in contact with the quarantined person at least once a day. The quarantined person is advised how he can at home avoid passing on the infection to people living in the same household or to e.g. persons who provide the patient with food. Social services must have a system in place to support those quarantined at home, as far as is necessary. Staff must take appropriate measures to protect themselves from infection.

During a long-haul flight, a justified suspicion may arise that a passenger has contracted a disease caused by an influenza virus posing a pandemic threat. In such a case, an assessment of the situation conducted by health authorities may define all or some of the passengers on the aircraft as exposed. If there is an airport in the area taking long-haul flights, a regional plan is required, allowing for quarantining of the passengers of a single aircraft, if

necessary. Under international recommendations, quarantine measures for passengers are not otherwise considered. The extent of the measures depends on the pandemic alert phase.

10.2.5 Post-exposure short-term antiviral drug therapy

If the influenza virus posing a pandemic threat is sensitive to antiviral drugs, all those exposed are administered short-term prophylaxis. This is not implemented if the time elapsed since the last exposure is longer than the known incubation period of the influenza virus infection.

Short-term prophylaxis for adults post-exposure to the A/H5N1 influenza virus currently posing a pandemic threat is oseltamivir 75 mg once a day for seven days. Dosage for children is determined according to weight. The grounds more specifically linked to choice of drug and execution of drug treatment are explained in more detail in section 4.4.

10.2.6 Information-gathering

The different stages of action concerning the exposed demand management of information on them. One case may be linked to dozens or hundreds of exposed people.

A data system must be created for management of information on those exposed and quarantined, allowing for recording of such information and its utilisation in implementation and monitoring of the activity at local, regional and national levels.

10.3 Examination and treatment of patients

10.3.1 Treatment chain in patient care and placement

Aims and main principles

During an influenza pandemic alert (WHO phases 3-5), the aim is prevention or considerable delaying of a pandemic. During phases 3-5, the influenza virus increasingly adapts to humans and its transmissibility increases. The patient numbers in Finland are few or at most a few dozen. The burdening of healthcare is still such that it allows implementation of the measures within the framework of the normal system. Adequacy of isolation facilities, supplies of drugs and equipment does not prevent protective measures for nursing and other staff on usual medical grounds.

Patients are directed and transported as directly as possible to the final place of treatment in order to avoid infections. In hospital, treatment of all patients fulfilling the case definition is carried out using the standard precautionary measures, contact, droplet and airborne isolation (see section 10.4, appendices 6 and 8). During phases 3-5, tracing and quarantine measures of those exposed are implemented in order to break the infection chain (see section 10.2).

At the pandemic phase (WHO phase 6), the aim is to delay timing of the maximum morbidity of the pandemic through preventive methods (vaccinations, non-pharmaceutical methods, see sections 7.1 and 7.2) and reduction of serious cases of illness and deaths caused by influenza through effective treatment that is started early. The great burdening of patient

care is likely to demand emergency arrangements with regard to organisation and facilities, in order to fulfil the need for care. Due to the heavy burdening and nature of the facilities available, it may not necessarily be possible to implement the same level of isolation and protection comprehensively as during WHO phases 3-5. In that case, the emphasis is on close observation of good hand hygiene and protection from droplets (see section 10.4).

Reception, triage and transport of patients should be executed in such a way as to avoid infections at the different levels of the treatment chain, as far as possible, also at the pandemic phase. The patients should be sent as directly as possible to the final treatment facility. As great a proportion of influenza patients as possible should be cared for at home. Setting up of dedicated influenza clinics is likely to be necessary in primary healthcare. In hospitals, patients are cohorted (grouped). The number of patients requiring intensive monitoring and respirator treatment is great.

During phase 6 the number of exposures is high. At this stage, tracing and quarantining of the exposed no longer help to delay the progress of the pandemic, so they are not included in the activity.

Seeking of treatment by patients and arrangements in the treatment chain

Influenza pandemic alert (WHO phases 3-5)

Patient

If a patient has symptoms indicating influenza posing a pandemic threat, he should initially contact healthcare services by telephone. According to instructions received, he should go directly to the designated place of examination and treatment, avoiding extraneous contacts and observing good hand and coughing hygiene. This goal demands informing the population on the grounds and procedures of seeking treatment.

Outpatient care

In the first instance, the healthcare staff determine by telephone the exact details regarding symptoms, travel and exposure, and assess whether they fulfil the clinical criteria of influenza causing a pandemic threat (see section 10.1.2, updated instructions are on the NPHI website www.ktl.fi – Terveyden ammattilaisille). If the criteria are fulfilled, the doctor next consults the infectious diseases specialist of his own Hospital District, and if he is not available, the infectious diseases specialist of his own special sphere of responsibility. Following his instructions, the patient is then sent as directly as possible to the final place of treatment, avoiding extraneous contacts.

Reception and transportation of patients is executed in such a way as to avoid infections. During the procedure, diligent observation of good hand hygiene and protection from droplets is essential (see section 10.4).

Every confirmed case of suspected influenza subtype causing a pandemic threat must be notified as soon as possible to the National Public Health Institute Department of Infectious Disease Epidemiology. Tracing and quarantining of those exposed is implemented using procedures described in section 10.2. Use of antiviral drugs for post-exposure short-term prophylaxis is also addressed in section 10.2.

Hospital
Reception and transportation of patients is executed in such a way as to avoid infections. Patients must always be taken as directly as possible to the final place of treatment, and transfers between hospitals should be avoided, if possible. Patient care is carried out using the standard precautionary measures, contact, droplet and airborne isolation (see section 10.4, appendices 6 and 8).

Airborne isolation facilities are not available in all hospitals that will potentially become treatment units. As far as possible, the isolation facility is selected in the following order:

1. Isolation room equipped with sealed lobby, with en-suite WC and washing facilities, separate ventilation, negative pressure and air replacement 6-12 times per minute (airborne isolation room).
2. isolation room with sealed lobby
3. single room with en-suite WC and washing facilities
4. cohorting in room/rooms with separate ventilation but shared WC and washing facilities

If separate ventilation is not an option, the arrangements are planned in cooperation with the hospital technical unit.

Pandemic phase (WHO phase 6)

Patient
During the pandemic phase, the population is educated on personal behaviour that can prevent infections, and of possible exceptional procedures in seeking treatment. Citizens are issued with clear, uniform national instructions on symptoms that are sufficient grounds for telephoning or going to the correct treatment centre in the healthcare system. Patients are directed through local methods of communication; telephone helplines, online services and other public information channels, as directly as possible to the final place of treatment, depending on the severity of the clinical picture.

Outpatient care
Burdening of primary healthcare is significantly determined by whether the stockpiled antiviral drug is effective against the influenza pandemic virus. If the drug is effective against the virus, the initial aim is that everybody suffering from influenza-like illness registers within 48 hours at a healthcare unit which carries out a clinical assessment and decides on starting antiviral drug therapy (see section 7.3 and 10.3.2). The aim is to prevent complications and deaths by early antiviral drug treatment. This adds considerably to burdening of outpatient care.

In a pandemic situation, uniform national directions on use of antiviral drugs will be issued. Resistance to antiviral drugs developing during a pandemic may lead to significant procedural changes regarding use of drugs that must be implemented quickly. Forced rationing of drugs is also a possibility. When an antiviral drug with regulated indications for use and limited availability is used extensively, the need for monitoring its correct use is considerable.

If the stockpiled antiviral drugs are not effective against the pandemic virus, they are not used during the pandemic. If it is not justifiable to use antiviral drugs or if stocks run out

while the pandemic is still ongoing, as large a proportion of patients as possible are nursed at home in order to avoid additional infections. In such a case, the basic principles of seeking treatment from healthcare services and referrals are the same as in normal situations.

Regardless of whether or not the aim is early antiviral drug therapy for everyone contracting influenza, the patient numbers are likely to be so large that reception and treatment arrangements must be made that diverge from normal situations. Due to large patient numbers and the above-mentioned special features of influenza treatment, it is probably necessary to organise special influenza clinics. In order to avoid infections, they are positioned separately from premises used by other patients. Movement of patients should be organised in such a way that no additional infections occur. In order to avoid additional infections, if would be beneficial if distribution of the antiviral drug involves as little movement of the patient as possible from one place to another.

The need for home visits will increase and probably exceed capacity. Support should be organised for care of patients nursed at home. Pressure on social service activities linked to contracting the illness will be great.

Each primary healthcare unit should map the non-urgent functions that can be suspended in a pandemic situation. The premises and personnel released by interruption of non-urgent functions are utilised. Due to large patient numbers, influenza clinics may have to be run by community nurses and nursing staff or healthcare professionals other than doctors. After induction and according to pre-issued guidelines, they triage the patients to be directed to a doctor's surgery or a hospital emergency room, decide whether an antiviral drug should be prescribed, and issue it to the patient. The work takes place under the direction and responsibility of a doctor.

The influenza clinic should be on-call in nature, preferably 24 hours a day, where the assessment is made quickly and the patient's waiting time should be as short as possible. If the burdening is great, only e.g. children under a year old and pregnant women, possibly requiring hospitalisation, are directed to the doctor's surgery and hospital emergency rooms. Citizens are informed locally of emergency arrangements.

At all levels of healthcare, the emphasis is on close observation of good hand hygiene and protection from droplets (see section 10.4).

Hospital

Placement of patients

Reception, triage and transportation of patients should be executed in such a way as to avoid infections. The patients must always be sent as directly as possible to the final place of treatment in order to avoid infections.

Factors influencing patient placement include the type of isolation used, patient numbers, and the level of care the patient needs, i.e. whether he can be nursed on the ward or whether he needs observation, intensive care or respirator treatment. Depending on available facilities, even 2-5 simultaneous suspected influenza cases may create a situation where not everyone can be treated in appropriate airborne isolation. Airborne isolation rooms in intensive care departments are likely to run out at a very early stage. If the number of patients requiring isolation is 5-30, special arrangements are probably necessary. If there are more than 30 patients, the situation is an emergency and deployment of an emergency hospital plan may be required.

Hospitalisation of children requires special arrangements, as the carer must be present in hospital due to limited staff resources.

At the pandemic phase (WHO phase 6) patient numbers are so large that airborne isolation is not possible for everybody. Hospitals will observe diligently at least the standard precautionary measures, contact and droplet isolation. Essential aerosol-producing procedures on patients should be carried out in airborne isolation rooms or at least in single rooms (see section 10.4, appendix 8).

Placement within wards
Non-urgent elective activity will probably have to be reduced or discontinued, in order to free facilities and staff.

If there are insufficient numbers of isolation rooms, influenza patients should be concentrated preferably in a separate building. If this is not possible, patients are concentrated in a ward with ventilation that is separate from that of other areas. If separate ventilation is not an option, the arrangements are planned in cooperation with the hospital technical unit.

Placement in intensive observation and intensive care wards
There are not enough airborne isolation rooms in intensive care wards during a pandemic. The patients may be cohorted within an intensive care or intensive observation ward, or in a single intensive care or intensive observation ward. Operating theatres and recovery wards freed from elective activity may be used for patients requiring intensive care. It is likely that these facilities are also insufficient.

Properties of an ideal temporary hospital
Caring for large patient numbers may require deployment of temporary hospitals. Premises suitable for this purpose should be identified for preparedness plans. The best alternative for a temporary hospital would be premises in hospital use, with existing required functional equipment, and from which patients could easily be moved elsewhere. The temporary hospital should be situated away from other operational units, but yet close to support services, such as x-ray and laboratory services. A prepared plan should exist on deployment of temporary hospitals and removal of patients and functions normally using the facilities.

The deceased
Exceptionally high mortality should be taken into consideration by ensuring adequate appropriate facilities for storing the deceased.

10.3.2 Using antiviral drugs

During the pandemic alert period (WHO phases 3-5), precautionary measures and starting of antiviral drug treatment are based on clinical suspicion fulfilling diagnostic criteria (see section 10.1.2). The diagnosis is confirmed by laboratory tests (see section 10.1.3). Conclusion of the treatment depends on laboratory test results and their reliability.

During the pandemic period (WHO phase 6), the majority of all feverish respiratory tract infections are caused by influenza, and due to large patient numbers, confirmation of diagnoses with laboratory tests is not possible for all patients. The diagnosis of influenza is based on a clinical definition (see section 10.1).

Use of antiviral drugs must comply with national guidelines. The preliminary goal is that both during the pandemic alert period (WHO phases 3-5) and the pandemic (WHO phase 6),

all who have contracted influenza should be given specific drug therapy at least within 48 hours from onset of symptoms, providing that the drug is effective against the pandemic virus and that sufficient quantities of it are available (see section 7.3 and section 10.7). During the pandemic (WHO phase 6), special arrangements in healthcare may be necessary in order to ensure that all those affected receive treatment as quickly as possible, and that additional infections are avoided in connection with distribution of the drug (see appendix 2 *Local preparedness plans for an influenza pandemic – primary healthcare*).

Antiviral drugs for influenza are described in section 4.4.

The National Agency for Medicines is responsible for monitoring drug side-effects. The monitoring procedures and register currently in use are suitable for collecting side-effect information during a pandemic.

10.3.3 Antibacterial drugs required for treatment of complications

Antibacterial drug therapy is indicated in suspected cases of pneumonia as a complication of the influenza infection. Other complications of influenza may be acute sinusitis and with children, middle ear infections. Complications of influenza are described in section 4.1.

In drug therapy, it is most important that the chosen antibacterial agent covers the likely pathogens. The main pathogenic bacterium is *Streptococcus pneumoniae* (pneumococcus), but *Haemophilus influenzae* and *Staphylococcus aureus* are also possible, which is why established practice differs somewhat from customary recommended antibiotics for treatment of pneumonia.

During pandemic alert phases 3-5, adequate supplies of antimicrobial drugs are not a problem and do not limit the choice of antimicrobial agent.

In pandemic phase 6, when the number of patients is exceptionally large, availability of antibacterial drugs is probably limited and reduces the choice.

Antibacterial drugs used in hospital

Obligatory stocking of drugs in hospitals and health centres is determined by the basic drug range of each unit, and the obligatory stocks should equal six months' consumption (see section 11.2). Therefore, the antibacterial drugs to be used in a pandemic situation should be included in the basic drug range of the unit. A standardised antibiotic recommendation also facilitates the work of healthcare personnel.

The primary recommended treatment for bacterial pneumonia complicating influenza requiring hospitalisation is intravenous administration of cefuroxime. Cefuroxime is effective against the likely pathogenic bacteria, and it is held in obligatory stocks of healthcare units, as it is frequently used under normal conditions. As necessary, broader-spectrum antibacterial agents may also be used, but their obligatory stocks are considerably smaller.

Antimicrobial drugs used in outpatient care

Of pharmaceutical preparations included in pharmaceutical manufacturers' and importers' obligatory stocks, in practice the only antibacterial drugs currently capable of being utilised in a pandemic situation in outpatient treatment of pneumonia and other respiratory tract infections are amoxicillin, amoxicillin and clavulanic acid and doxycycline (see section 11.2).

At the time of implementation of the pandemic plan, the principles and regulation of obligatory stockpiling will be assessed in more detail, including the need for obligatory stocks

to ensure sufficient supplies of drugs required to treat bacterial infections in a pandemic situation.

10.4 Protection against infection in healthcare

During an influenza epidemic, protection of healthcare personnel from infection is crucial. It is the most important means of prevention and slowing down of the spread of infections before a vaccine becomes available. The properties of the pandemic virus are not known in advance. This protection plan makes the assumption that the pandemic virus is transmitted, spread and destroyed in the same way as seasonal influenza viruses.

10.4.1 Transmission mechanisms

A person who has contracted seasonal influenza secretes the virus into his respiratory tract and may transmit the disease to another person through coughing or sneezing (droplet transmission). The large droplets (>5 µm Ø) produced when coughing or sneezing do not float in the air, but fall down, and do not travel further than a metre from the coughing or sneezing person. Transmission may also take place via hands contaminated by respiratory tract secretions (direct contact transmission). In addition, it is possible to become infected from surfaces or materials in the environment, if they have become contaminated by respiratory tract secretions (indirect contact transmission). For a person to become infected, respiratory tract secretions must come into contact with membranes of the upper respiratory tract or the eyes, for example through touching them.

In experimental studies, the influenza virus has been shown to remain viable on smooth metal and plastic surfaces for 24-48 hours at most, and on clothing and tissues 8-12 hours maximum. From the surfaces, the influenza virus has been transmissible to hands for 24 hours after contamination by the virus, and for 15 minutes from a tissue. However, on the hands the virus numbers decline to one hundredth–one thousandth in a few minutes. It should be noted that transmission via the environment or materials requires great numbers of virus, such as are present in respiratory tract secretions in the early stages of the disease. The influenza virus becomes inactivated in 30 seconds with alcohol-based hand rinses. Customary disinfectants used for secretion contaminations also inactivate it.

The incubation period of seasonal influenza from infection to onset of symptoms is 1-4 days, on average 2-3 days. Adults are already contagious a day before the symptoms begin and 3-7 days thereafter, on average for five days. Young children may be contagious several days before the onset of symptoms, and the contagiousness may continue longer than with adults (7-21 days). Patients with reduced resistance may secrete the virus into their respiratory tract for several weeks or even months. A patient with symptoms secretes greater quantities of virus into his respiratory tract and is therefore more infectious than a symptom-free patient. This is the case especially during the first few days.

Droplet transmission and both direct and indirect contact transmission are the principal transmission mechanisms of seasonal influenza. Airborne transmission is possible, particularly if procedures are carried out in hospital on an influenza patient, whereby fine droplet aerosol (1–5 µm Ø) is formed from respiratory tract secretions. This fine aerosol can float in the air for long periods and travel a distance of more than a metre. Such procedures are e.g.

intubation, endotracheal aspiration, tracheostomy care, respiratory physiotherapy, bronchoscopy, nebuliser treatment and autopsy of the lungs.

10.4.2 Precautionary measures

The customary precautions, i.e. good hand hygiene and protection from secretions are the basic principles of infection prevention.

Customary precautionary measures and good hand hygiene
Customary precautionary measures mean the recommended good nursing practice in healthcare client/patient treatment and care. Their purpose is to prevent transmission of microbes from employees to patients, from patients to employees, and from patients via employees to other patients. This practice is recommended regardless of whether or not the patient is infected. The customary precautionary measures are based on hand hygiene and apply to blood, all bodily fluids and secretions, patient's broken skin and membranes (*Appendix 8 Classes of precautionary measures*).

In healthcare institutions, good hand hygiene means disinfecting massage of the hands using an alcohol rinse. The hands must always be disinfected before and after every patient contact, as well as after removal of protective gloves and on leaving isolation rooms. The hands are washed with soap and water before disinfecting only when they are visibly soiled or possibly contaminated with secretions. Use of protective gloves does not replace disinfecting the hands. Gloves are used for a single patient or procedure and they must not be allowed to contaminate surfaces in the environment.

Protection from droplets
Protection from patients' respiratory tract secretion droplets is by a surgical mouth-nose mask and visor or protective glasses (*Appendix 6 Using respirator and surgical mouth-nose masks in healthcare*). In addition, patients are instructed to cover their nose and mouth with a tissue when coughing and blowing their nose, or a coughing patient is given a surgical mouth-nose mask (*Appendix 7 General hygiene instructions for prevention of respiratory tract infections*).

Protection from airborne infection
Protection from airborne infection (fine aerosol) takes place with a respirator mask (*Appendix 6 Using respirator and surgical mouth-nose masks in healthcare*). Preferably, an FFP3 mask or a powered air-purifying respirator (PAPR) equipped with a P3 filter should be used, with an FFP2 mask as second choice. At the same time, protection from droplets requires separate eye protectors (mask type protectors, goggles with side pieces or a visor, not necessary with a PAPR). With reference to PAPRs, it should be noted that staff should have received prior training in working with a PAPR (e.g. risk of needle accident), that their cleansing/disinfection is carried out safely, and that appropriate storage facilities are designated for them. Technical properties of the patient accommodation (separate ventilation, direction and filtering of air flows) are used to reduce fine aerosol content of the air and to prevent its transmission to other parts of the hospital.

Handling of waste and equipment, meals, cleaning and laundry handling should follow normal practice (*Appendix 8 Classes of precautionary measures*). In cleaning, particular at-

tention should be paid to diligent cleaning of surfaces likely to be touched. Disinfectants are used on surfaces in accordance with usual hospital practice. Employees cleaning patient accommodation and facilities and taking specimens should take the same protective measures as nursing staff.

It is important to identify employees who have contracted influenza quickly, in order to restrict the spread of the pandemic. Affected employees and visitors should be kept away from healthcare premises as far as possible.

Training is provided for the entire staff on transmission mechanisms of influenza and the basic principles of protection. Employees working in patient quarters are given separate training in implementation of precautionary measures and use of personal protection. Patients and visitors are also instructed on transmission mechanisms of influenza and the basic principles of protection. (*Appendix 7 General hygiene instructions for prevention of respiratory tract infections*).

10.4.3 Precautionary measures at different pandemic phases

Pandemic alert period or WHO phases 3-5

During the influenza pandemic alert phase, the aim is to prevent the pandemic or at least to considerably delay it. At this stage, there will be individual patients suffering from influenza in Finland, or a few dozen at most. Problems are not envisaged with regard to appropriate isolation facilities, staff trained in use of respirator masks or sufficient supplies of protective equipment.

All patient examinations and care are carried out under the standard precautionary measures, or good hand hygiene and protection from patients' respiratory tract secretions (*Appendix 7 General hygiene instructions for prevention of respiratory tract infections*). To minimise additional infections, patients requiring hospitalisation are directed or transported as directly as possible to the actual place of treatment, in accordance with instructions issued by the medical practitioner in charge of infectious diseases in the Hospital District.

At the actual place of treatment, customary precautionary measures are observed, as well as instructions on contact, droplet and airborne isolation (*Appendices 8 Classes of precautionary measures, 6 Using respirator and surgical mouth-nose masks in healthcare*).

Pandemic period or WHO phase 6

During the pandemic phase, the aim of protective measures is to delay the timing of the peak morbidity caused by influenza and to minimise the number of serious influenza cases and deaths. At this stage, the number of patients suffering from influenza and requiring hospitalisation is high. There are not enough appropriate isolation facilities, and there may be shortages of protective equipment or staff trained in use of respirator masks.

All patient examinations and care are carried out using standard precautionary measures, or good hand hygiene and protection from patients' respiratory tract secretions (*Appendix 7 General hygiene instructions for prevention of respiratory tract infections*). To minimise additional infections, patients requiring hospitalisation are directed or transported as directly as possible to the actual place of treatment, following regional instructions.

Unavoidably, hospitals are forced to cohort patients. Cohorting means division of patients into groups and caring for the groups separately from others. The patients are divided according to symptom-based case definition into influenza and non-influenza patients. Those exposed are placed with influenza patients, if there is no dedicated group for them, and new

patients with non-influenza cases, if they do not present with influenza symptoms. The cohorts should have separate nursing staff, if possible. If this is not possible, in daily work the non-influenza patients should be attended to first and then the influenza patients. However, the patient's need for urgent and emergency treatment must be taken into consideration.

In hospital, customary precautionary measures are observed in the influenza patients' cohort area, as well as instructions on contact, droplet and airborne isolation (*Appendices 8 Classes of precautionary measures and 6 Using respirator and surgical mouth-nose masks in healthcare*). If this is not possible, in addition to customary precautions, at least contact and droplet isolation instructions should be observed in contact nursing *(Table 6 Minimum requirements of staff protective measures during the pandemic period (WHO phase 6)*). Procedures forming aerosols with influenza patients should be avoided. If this is not possible, in addition to protective gloves and coat, staff should wear a respirator mask (FFP3 or in work taking some time, a powered air-purifying respirator equipped with a P3 filter, see 10.4.2), and a visor or protective goggles (not necessary with a powered respirator) during these procedures. They should be carried out in air isolation facilities. If this is not possible, a separate room with the door closed should be used, with only the necessary number of staff present.

Table 6. Minimum requirements of staff protective measures during the pandemic period (WHO phase 6)[7]

	In cohort area but not close contact[7]	Close contact (<1 m)	Precedures producing aerosol[8]
Hand hygiene	+	+	+
Protective gloves	-[9]	+[10]	+
Protective apron	-[9]	+	-
Protective coat	-	-/+[11]	+
Surgical mouth-nose mask	+	+	-
Respirator mask FFP3	-	-	+
Visor or goggles	-	-/+[12]	+

7 customary precautions are always taken

8 intubation, endotracheal aspiration, tracheostomy care, respiratory physiotherapy, bronchoscopy, nebuliser treatment and autopsy of the lungs.

9 cleaning staff should always wear protective apron and gloves in addition to surgical mouth-nose mask

10 if there is a shortage of protective gloves, they should be worn when handling secretions, broken skin and mucous membranes (customary precautions)

11 protective coat should be worn in place of protective apron, if extensive soiling of uniform or direct skin contact with blood or other secretion anticipated, e.g. intubation or treating young children

12 goggles or visor should be worn if risk of blood or secretion spray (customary precautions)

10.5 Occupational health and safety and placement of staff in healthcare

During a pandemic, healthcare employees may contract influenza outside their workplace or they may become exposed while carrying out their duties. It is important to identify employees who have contracted influenza quickly, to prevent transmission of the disease to patients and other employees.

Employees who are sick must be kept away from patient care. Exceptions may have to be made, e.g. in case of employees with mild symptoms or who are recovering, if there are significant staff shortages. Employees who have mild symptoms or are recovering, and feel that they are fit for work, may nurse influenza patients, but they should avoid contact with other patients and healthy employees.

Employees should inform the party responsible for employee placement that they have had influenza and recovered, as it may affect their future duties. Correspondingly, the party responsible for employee placements ensures that sickness and absence information is passed on to occupational health and safety departments.

The general principle is that healthcare employees who nurse influenza patients do not nurse other patients or enter other premises with patient access. Exceptions may have to be made, particularly in the case of small occupational groups, or if there are significant staff shortages.

Nor is this necessarily feasible in outpatient healthcare. During the pandemic, hospital employees may be transferred to care for influenza patients if they have previously nursed other patients, but not vice versa. Conversely, employees who have had influenza should primarily be placed to nurse influenza patients, since they are not at risk of contracting influenza, nor do they spread it. Similarly, these employees may be placed in units where influenza would have serious consequences, such as organ transplant units, neonatal intensive care units and outpatient haemodialysis units.

Healthcare employees, who are at great risk of contracting complications of influenza, should not participate in direct patient care. They should be considered for other duties, or in any case they should not nurse influenza patients. They include e.g. pregnant women and employees with reduced immunity.

Temporary employees are subject to the same operational principles as permanent staff.

If the situation demands using staff that has not received healthcare training, it must be noted that the employer is always liable for them and should ensure that untrained people are capable of the tasks they have been assigned. The employer must familiarise the employees with the risks and dangers of the job.

Occupational health services of healthcare employees may be outsourced. In that case, the agreement must include the above duties in a pandemic situation.

Duties of occupational health services

- To maintain a system of monitoring influenza cases of employees and absences from work
- To organise antiviral drug treatment for employees
- To implement employee vaccinations
- To work in close cooperation e.g. with parties responsible for prevention of infection, recruitment and employee placement

10.6 Vaccinations

10.6.1 Targeting of vaccinations

Finland has set the target of obtaining pandemic vaccines equally for all residents. Despite the decisions made and vaccine procurement contracts, preparations must also be made for the eventuality that not enough vaccine is simultaneously available for everybody. It is therefore expedient at least to define the principles under which people are placed in order of priority for vaccinations.

Recommendation on vaccination against normal seasonal influenza
Influenza vaccinations of population groups for which the disease constitutes a substantial health risk are administered annually before the start of the epidemic season free of charge, as part of the general inoculation programme. The vaccination groups include all those over 65 and those suffering from certain chronic illnesses. For these population groups, even ordinary annually recurring influenza may be fatal. Conversely, it is only rarely dangerous for basically healthy young or middle-aged persons. For example, according to American and Finnish mortality statistics, studies show that the risk of over-65s dying as the consequence of customary influenza is 50-200 times that of under-65s. During an annual epidemic, 5–20 percent of the population contracts customary influenza, and 1–2 per thousand over-65s die as the consequence of annual influenza.

What is different during a pandemic?
The effects of the disease caused by a pandemic virus are expected to be considerably more severe than those of annual influenza. The number of those affected during the first pandemic wave (duration in community 6–8 weeks) is estimated at 25–35 percent. The number of deaths during the first wave is estimated at 2–4 times that of customary seasonal influenza, if it is a case of a moderate pandemic, and up to 40 times if the pandemic is particularly severe. The estimates are based on information collected from the three pandemics of the 1900s. Of them, the 1957–58 and 1968–69 pandemics may be deemed to have been moderate and the 1918–19 pandemic particularly severe.

As well as an absolute rise in morbidity and mortality rates, all the pandemics of the 1900s have been characterised by the relative transfer of deaths to younger age groups. During the two milder pandemics, mortality was still clearly higher among over-65s than with younger age groups. In the United States, the risk of over-65s dying of influenza during the 1957–58 epidemic was 18-fold and during 1968–69 13-fold compared to younger age groups. The 1918–19 pandemic was totally different from the milder pandemics, both in terms of mortality rates and age distribution. The mortality rate was 40–50 times that of normal influenza epidemics, and according to an American study, the risk of death for under-65s was more than threefold compared to that of older age groups. At greatest risk of dying were children under five and people aged 20–40.

Thus, the severity of pandemics and the danger to different age groups can vary a great deal. Therefore, it is not possible to draw up a universally applicable vaccination plan in advance. The priority order of vaccinations can be finally determined only just prior to the start of the vaccination programme. Nevertheless, it is expedient to draw up preliminary plans both in case of a moderate pandemic, such as those of 1957–58/1968–69 and a severe one,

such as the 1918–19 pandemic. It is most important to define the objective of the vaccination, i.e. the grounds upon which they should be targeted.

Priority for personnel caring for infected patients

In most cases, there are no justifications for giving certain defined key groups priority in vaccinations. Defining key groups and organising such special vaccinations would expend inordinate resources in relation to benefits gained.

However, the workload and personal risk to staff caring for infected patients, compared to all other groups, is in a class of its own, and therefore immunisation of this group first may be deemed to be justified. The grounds are described in more detail in section 9.

Aim of saving years of life while respecting principle of equality

Vaccination is a simple protective measure and applicable to all. At the threat of a severe epidemic, targeting of vaccinations must be based on a benchmark that is as widely acceptable as possible and compliant with a sense of common justice.

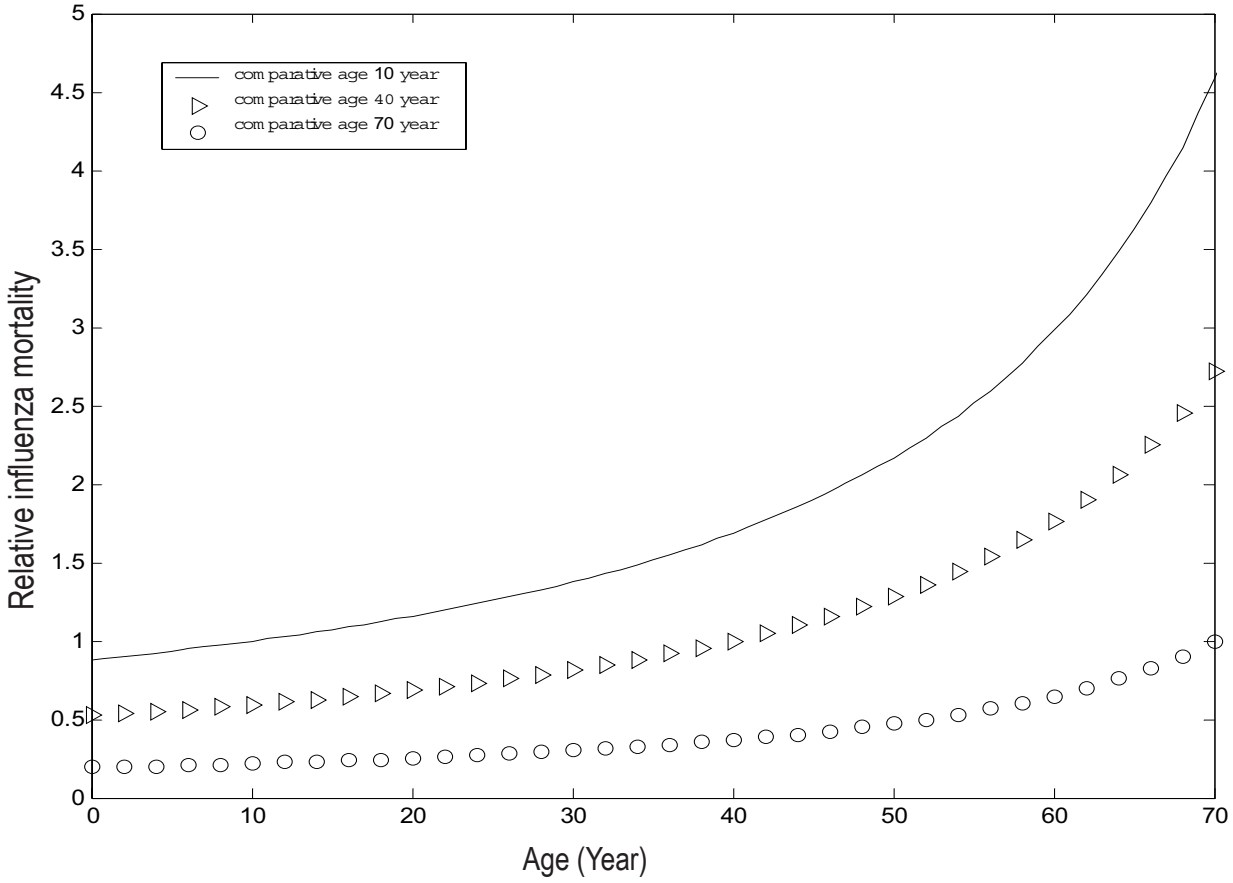
The aim is to use vaccinations to save as many years of life as possible. To ensure that equal treatment of citizens is not jeopardised when defining target groups, the calculated life expectancy should take into account only the age group, and not e.g. such factors affecting life expectancy as social group or chronic illness.

Definition of saving years of life

If the aim of vaccinations during an influenza pandemic is specifically saving years of life, information or justifiable assumptions of life expectancy based on age (average years of life remaining) is required, as well as influenza mortality based on age and the effect of the vaccine on influenza mortality. After this, targeting of vaccinations is based on simple deduction: in an older age group, influenza mortality must be greater than in a younger age group, in order that the expectancy of saved years of life per vaccinated person would be equal. For example, because life expectancy of 60-year-olds is about one third of that of 10-year-olds, influenza mortality of 60-year-olds should be three times that of 10-year-olds, in order that vaccination of 60- and 10-year-olds would save on average the same number of years of life.

The attached diagram shows the relative age-related influenza mortality required for vaccination to achieve the same expectancy of saved life years as with vaccination of a 10-, 40- or 70-year-old. The estimates are based on the assumption that the effect of the vaccine is the same for all age groups (level of effectiveness is not relevant in this assessment). Assuming the effect of the vaccine as the same for all ages probably slightly favours older age groups, as the current thinking is that the effect of vaccination is lower with the aged.

Diagram 1. The unbroken line is the level of age-related relative influenza mortality (compared to influenza mortality of 10-year-olds) that leads to the same expectancy of saved years of life as vaccination of a 10-year-old. The corresponding observations have been made for comparative ages of 40 years (triangles) and 70 years (circles).



If further assumptions on influenza morbidity and case mortality are made, the number of years of life saved by targeting vaccinations can be estimated. The table below shows one calculation of numbers of influenza cases (of illness) and deaths caused by the pandemic in a situation where the population is not vaccinated at all, and an estimate of the number of years of life saved through vaccination per one vaccinated person. The population is split into three age groups (0–19, 20–64, >64). In addition, each age group is split, in terms of influenza mortality, into those under basic risk and those under increased risk (based on those recommended for influenza vaccinations and receiving special concessions from KELA, the latter numbering approx. 3.3%, 8.4%, 48.0% within these age groups). The other assumptions affecting the results are given in the table. The assumed morbidity and mortality rates used in the table fall into the middle ground between the two milder pandemics of the 1900s and the 1918–19 pandemic.

Table 7. Numbers of people contracting and dying of pandemic influenza without vaccinations and the expectancy of years of life saved by vaccination per one vaccinated person. The figures are based on the following assumptions: morbidity 25 percent of population; proportion of those affected in each of three age groups 42/21/16 percent; case mortality in the three age groups 0.5/0.75/1.5 percent (base risk group) and 1.0/1.5/2.0 percent (heightened risk group); effectiveness of vaccine 70 percent; life expectancies in the three age groups are 72, 48 and 15 years. (Reference re: morbidity and case mortality: Doyle et al., unpublished to date.)

	0–19 yrs base risk	0–19 yrs heightened risk	20–64 yrs base risk	20–64 yrs heightened risk	>64 yrs base risk	>64 yrs heightened risk	Total
At risk*	1,207	41	2,920	268	423	391	5,250
Number affected, if no vaccination*	508	17	601	55	68	63	1,312
Number of dead, if no vaccination*	2.54	0.17	4.51	0.83	1.02	1.26	10.33
Saved years of life /1000 vaccinated persons	110	210	50	110	30	20	

* The figures signify thousands of persons, e.g. 5,250 = 5,250,000 persons

According to the plan shown in the table, the vaccinations would be targeted on the population in order of age, starting from children. Within each age group, the greatest health benefit would be achieved by giving priority to vaccinating those at heightened risk. Other kinds of assumptions on morbidity and/or case mortality may lead to a different result. However, it should be noted that the order of priority in different age groups is essentially dependent only on the (relative) influenza mortality rates of the age groups (cf. previous figure). In reality, mortality figures only become known after the onset of the pandemic. It is likely that information will be already available before a widespread strike of the pandemic among the Finnish population.

Different order of vaccinations in different pandemics – two examples

Moderate pandemic (as in 1957–58 or 1968–69)

In a moderate pandemic, mortality transfers to some degree to younger age groups, but the risk of death of the over-65s (and possibly also those in clinical risk groups) is still 10-20 times that of younger people. During such a pandemic, the vaccination recommendation of customary seasonal influenza could probably be applied, after the personnel caring for infected patients has been vaccinated. The order of vaccination would then be:

1. Personnel caring for infected patients (50,000–150,000 people)
2. Over-65s and those in seasonal influenza risk groups due to chronic condition (in 2005 approx. 1.1 million persons)
3. 0.5[13] – 64-year-olds not in risk groups (approx. 4.1 million persons). Possible prioritisations within this group will be made early during the pandemic or during the immediately preceding alert phase, on the basis of collected mortality information.

[13] Research shows that influenza vaccination results in a protective level of antibodies only from the age of 6 months.

However, in such a case serious consideration should be given to starting vaccinations from younger age groups, since they are at most risk of becoming infected and thus also spread the disease most. Latest research results indicate that vaccination of schoolchildren against influenza can indirectly significantly reduce influenza morbidity of other population groups too.

Modification of the seasonal influenza vaccination recommendation would be likely to reflect also on this order of vaccinations.

Severe pandemic (as in 1918–19)
If the pandemic is severe and results in a great deal of death also among the young, the general attitude to vaccinations is sure to be different from when the pandemic is moderate. Such a situation results in extreme burdening of healthcare. Thus, the vaccination plan must be simple, in order that resources are not wasted on establishing whether someone is entitled to vaccination or not. During a severe pandemic, it is probably almost impossible to distinguish those at special risk within age groups, and therefore the single recommended criterion for vaccination is age. In a severe pandemic, the order of vaccination would be:

1. Personnel caring for infected patients (50,000–150,000 people)
2. Everyone else from the age of six months, from youngest to oldest.

10.6.2 Establishing practical guidelines for vaccinations

Once the pandemic is declared, inoculations using the prototype vaccine must begin as quickly and comprehensively as possible, if there are stocks of suitable prototype vaccine at the start of the pandemic. In Finland, the decisions on using the prototype vaccine, the vaccination recommendation and order to be applied are made by the Ministry of Social Affairs and Health on instigation by the National Public Health Institute.

The vaccines must be distributed quickly throughout Finland. Local authorities must have detailed plans in place for the practical arrangements of the vaccinations and dissemination of information on them, so that the entire population can be vaccinated in a few weeks.

In municipalities, vaccinations may be carried out e.g. in health centres, hospitals, occupational healthcare, advisory health clinics, residential homes for the elderly, sheltered housing and community nursing, as well as possibly in schools. All premises planned for vaccinations must be carefully inspected in advance and detailed operational instructions prepared for each vaccination point. Sufficient space must be reserved for those waiting to be vaccinated, as well as for the vaccination event and follow-up monitoring. Each municipality needs several vaccination venues, so precise direction of residents to the correct vaccination point at the right time is important.

The National Public Health Institute is in charge of procuring of vaccines and their distribution via wholesalers to hospital pharmacies and dispensaries. They distribute the vaccines to local authorities. The vaccines are delivered in as large batches as possible, so receiving parties must set aside sufficient cold storage (+4–8 oC) for the duration of the vaccination campaign. It is particularly important that the division of labour between municipal operators is carefully planned in advance and their duties clarified in good time before the vacci-

nations begin. Vaccine quantities per municipality are estimated on the basis of population records, and the delivery destinations agreed in advance with the National Public Health Institute.

In order to implement mass vaccinations, local authorities must be prepared to recruit and train additional staff.

Availability and adequate stocks of equipment required for vaccination must be ensured, and their stockpiling must be planned in cooperation with the Hospital District.

The vaccine is most likely to be packaged in 50-dose bottles. One dose of vaccine is drawn into a disposable hypodermic syringe and injected using a dry needle into the muscle of the outer arm or thigh. Before the start of the vaccination campaign, NPHI will issue more detailed instructions on dosages of the vaccine, method of administration, choice of injection site, vaccination equipment and injection technique.

Common contra-indications are noted in the vaccination. NPHI notifies possible specific contra-indications before the start of the vaccination campaign.

The general condition of the vaccinated person must be monitored for 15-30 minutes post-vaccination. Preparations must be in place for treatment of anaphylaxis, as always after vaccinations.

Rokottajan käsikirja (www.ktl.fi>julkaisut>rokottajan käsikirja) lists the side-effects that should be at least notified to the National Public Health Institute.

Recording of vaccinations

Every recipient of a vaccination is issued with a document showing the date and venue of receiving his prototype or specific vaccine. In mass vaccination situations during pandemics, recording of vaccinations in accordance with the Ministry of Social Affairs and Health Decree 421/2004 either on a vaccination surveillance form or the equivalent field in the health centre electronic data system is not necessarily possible. Nevertheless, records must be kept of the numbers of vaccinations given (e.g. five-bar-gate tally). The National Public Health Institute may issue more detailed instructions before initiation of vaccinations. The National Public Health Institute collects the information from municipalities on numbers of vaccinations administered after the campaign is complete.

10.7 Indications for use of antiviral drugs and prioritisation

10.7.1 Pandemic alert phase

During WHO pandemic alert phases 3-5, antiviral influenza drugs are used for (1) treatment of patients to alleviate the severity of the illness and (2) short-term post-exposure prophylaxis. There is evidence of the efficacy of neuraminidase inhibitors (oseltamivir, zanamivir) in both of the above indications for use. Adamantine group drugs (amantadine, rimantadine) are effective in preventive use, if the virus is sensitive to them. The virus strains of the influenza A/H5N1 avian influenza epidemic, which originated in Asia in 2003 and raised the pandemic alert, have mostly been resistant to adamantine group antiviral drugs, but at least in one area A/H5N1 virus strains sensitive to adamantines have been identified.

Treatment of patients with influenza antiviral drugs is implemented in the manner outlined in sections 4.4 and 10.3.2. Choice of antiviral drug depends on the sensitivity of the virus to different drugs and new knowledge on the efficacy of drug treatment obtained from

analyses of patient treatment at the different alert phases. When interpreting the results, it should be noted that neuraminidase inhibitors are not expected to affect the outcome of treatment, if it is begun more than 48 hours from the onset of symptoms.

Exposure as justification of post-exposure short-term prophylaxis during pandemic alert phases 3-5 is defined in section 10.2. It should be noted that short-term preventive medication does not fully prevent the virus from reproducing and occurring in respiratory tract secretions, which must be considered when deciding on other precautionary measures.

It is likely that the events marking the WHO pandemic alert phases 3–5 will be located in countries outside Finland. With a single case entering the country, the number of those exposed may rise to dozens, even hundreds of people. The drug quantities held in the obligatory stocks of the normal drug distribution system and in reserve stocks (section 11.2 *"Procurement, reserve stocks and logistics"*) are likely to be sufficient for the purposes mentioned above, up to alert phase 5. Nevertheless, in order to secure adequate supplies of influenza drugs, prescriptions and deliveries of drugs must be carefully monitored, as with increased threat of a pandemic, delays in additional purchases are likely to be long.

If the events marking pandemic alert phases 4-5 are located in Finland, moving to procedures described as those of the actual pandemic phase (phase 6) will be considered, as the situation dictates, also with reference to use of influenza antiviral drugs.

10.7.2 During the pandemic

At the onset of the actual pandemic, the bases of using influenza antiviral drugs change. The objective is to reduce complications and deaths of influenza patients by treating as great a proportion of them as possible with antiviral drugs within 48 hours of the onset of symptoms. At this stage, it is no longer worth tracing those exposed, as the number of infections is already very large.

The measures aimed at effective treatment of patients are described in section 10.3. Due to pandemic alert phase 3, Finland obtained in 2005 a quantity of the drug oseltamivir sufficient to treat all the cases, if a quarter of the population is affected.

Only from the start of pandemic alert phases 4-5 will information accumulate regarding which age- or other population groups the pandemic alert influenza virus is affecting the most and causing significant numbers of serious infections, leading to hospitalisation or death. This information will have a decisive impact on the precise aims and final recommendations on antiviral treatment during the pandemic. If the accumulating information strongly indicates an Asian (1957) or Hong Kong (1968) pandemic type development, where the clinical descriptions of children and people of working age did not substantially differ from customary seasonal influenza, there is no need to take emergency measures in order to reach all those who are suffering from influenza symptoms, in order to administer the drug. In that case, drug therapy arrangements are targeted at high risk groups based on age or chronic illness. If information accumulating during a pandemic alert phase indicates large numbers of serious cases of infection in all age groups, the aim must be treatment of all those contracting influenza in the whole population. The case may also be that possible differences in morbidity of different population groups change during the pandemic, and thus final information on the matter is obtained only at the last moment.

A particular problem arises if the events of pandemic alert phases 4-5 are located in Finland, and they consume much of the drug stockpiles before the actual pandemic. Morbidity during the pandemic itself may be higher than the quarter of the population used as the basis

of stockpiling. Because a simple diagnosis based on symptoms is used during the pandemic as basis for treatment, some of the stockpiled drugs will inevitably be used on treatment of infections other than influenza. If the pandemic manifests, in common with certain previous pandemics, at brief intervals in more than one wave, it is likely that the influenza antiviral drugs are not sufficient to treat all those infected after the first wave. The partial resistance to antiviral drugs of the pandemic influenza virus may demand higher dosage and longer duration of treatment than anticipated, which would increase drug consumption and lead to premature depletion of drug stocks.

For reasons mentioned above, the target groups for antiviral drug treatment among those infected may need to be prioritised. Correct prioritisation of target groups for drug therapy from the viewpoints of the individual and society takes place according to the principles and decision-making chain described in section 9 *Ethical considerations in prevention of pandemics*. Drug stocks are released in accordance with regulations to be issued separately.

10.7.3 Viewpoints on use of antiviral drugs as long-term preventive medication

During a pandemic, the population becomes infected in homes, pre-schools, schools, workplace communities, incidental contact exposures in public premises and on public transport. Some of the exposures leading to infection take place from infected people with few or no symptoms, but who are carrying the virus in their respiratory tract secretions.

Occupational groups working in customer service are exposed to more people with symptomatic or symptom-free infectious influenza in their work than the rest of the population. The risk of infection can be reduced through means described in section 7.1 Slowing down the spread of infection. Improved hygiene and structural methods reducing droplet or contact transmission can be used to reduce the risk of infection in customer service, although it cannot be totally prevented.

Healthcare staff caring for infected patients are particularly frequently exposed to influenza infection in their work. In their case, prevention of infection during the pandemic is based on precautionary measures and use of a possible vaccine. Protection from infection is described in section 10.4 and use of vaccines in section 10.6.1. In addition to taking precautionary action and using vaccines, it is essential that healthcare personnel recognises, by active monitoring of their own symptoms, influenza-like symptoms immediately at their onset, so that antiviral drug treatment can be started early in order to alleviate the symptoms.

Long-term preventive use of antivirals will probably not be possible in a pandemic situation, due to their limited availability. For example, oseltamivir treatment for 100,000 people over the estimated 10-week duration of a pandemic wave would use up approx. 700,000 courses of treatment, or more than half of the drugs held in reserve stocks. The pandemic wave is likely to manifest in different regions of the country with phase delays of at least a few weeks. The associated lack of precision in defining the timing of the start and finish of possible long-term preventive medication would prolong its duration and increase total consumption.

Prophylaxis does not prevent initiation of the immune response brought about by normal seasonal influenza. The same may possibly be shown during a pandemic alert or in the early stages of an actual pandemic. If this is the case, those at greatest risk in healthcare could possibly be prescribed preventive medication for a limited period, thus avoiding short-term courses of prophylaxis following repeated exposures (phase 4-5) or unnecessary long-term preventive medication (phase 6). However, the precondition is that immunity can be ascertained by laboratory tests, which is likely to be difficult.

On the basis of modelling studies, it has been suggested that while human-to-human transmission of the virus is still weak in pandemic alert phases 4-5, small local infection clusters and chains could be broken by preventive administration of antiviral drugs to everyone working close to influenza cases found within a small, geographically defined area. The method may be useful particularly when the population has partial protection from previously given vaccinations, and the target group of preventive action is clearly definable e.g. in rural conditions. There are no clear international recommendations on this to date.

Due to the limitations on their application, relatively little interest has been shown in the adamantine group of antiviral drugs (amantadine, rimantadine) in relation to improving preparedness for an influenza pandemic. If the virus posing a pandemic threat is sensitive to adamantine group drugs, long-term preventive medication using them may be an option with specific target groups. They may be e.g. patient groups that do not obtain protection from vaccines due to long-term and profound immune deficiency, and with whom the risk of influenza complications is pronounced. Considerations linked to use of adamantines should be further investigated at the time of implementation of the pandemic plan.

11 PROCUREMENT, RESERVE STOCKS AND LOGISTICS

11.1 Vaccines

11.1.1 Procurement

In the supplementary budget of 2005, the Parliament approved funds for obtaining prototype vaccine. The supply contract with a Dutch vaccine manufacturer was signed in March 2006. The vaccine will be produced during 2006, but the final formula will only be decided after clinical trials. The intention is that 5.2 million doses of the prototype vaccine will be brought to Finland for stockpiling in 2008.

The National Public Health Institute has also signed a five-year reservation agreement on specific vaccine with the same Dutch influenza vaccine manufacturer. Under the agreement, it undertakes to supply Finland with 5.5 million doses of the vaccine. The specific vaccine will be delivered to Finland in one or more batches about six months after a pandemic has been declared. Production of the vaccine can only begin after WHO has declared that a pandemic is under way. Negotiations have taken place between the Nordic countries on a shared vaccine manufacturing facility.

11.1.2 Stockpiling and logistics

The rapid distribution of prototype and specific vaccines to be procured for Finland poses a great challenge to everyone involved, such as wholesalers, dispensaries and hospital pharmacies, in a pandemic situation. More than five million doses of prototype vaccine must be delivered to vaccination venues within as short a time as possible after declaration of a pandemic. If the cause of the pandemic is found to be a mutation of the current avian influenza virus (A/H5N1 subtype), a vaccination campaign covering the whole population using the A/H5N1 prototype vaccine will be implemented as soon as possible. The prototype vaccines delivered to Finland by the manufacturer will be stored e.g. at wholesalers and other cold storage (+2 - +8 o C) facilities suitable for drugs. Pharmaceutical wholesalers are in charge of correct storage of the vaccines and for their delivery to municipalities according to instructions issued by NPHI. Local authorities make the arrangements for storage and release of the vaccines delivered to them. The vaccine will be packaged in 30-50-dose injection bottles. Detailed instructions on packaging, dispatching and transfer to vaccination venues of the vaccine deliveries must be drawn up and agreed with all parties involved. Section 10.6.2 also includes information on transportation of vaccines.

However, the final decision on the manufacture, distribution and use of specific vaccine can only be made once the pandemic virus strain is identified. Specific vaccines do not require long-term storage, but are distributed almost immediately after arrival in the country to vaccination points, using the same logistics chain as in distribution of the prototype vaccine.

11.2 Drugs

11.2.1 Emergency supplies and obligatory stocks

Emergency supplies

The emergency supplies maintained by the National Emergency Supply Agency refer to state-owned drugs, pharmaceutical and raw materials procured to ensure security of supply in an effort to secure availability of so-called crisis-specific drugs during a long-term crisis, mainly using the principle of compensatory production. The stockpile is based on the Act on Safeguarding Security of Supply (1390/1992). There is no public information available on the drugs held in the Government stockpiles and their quantities, with the exception of the Tamiflu preparation obtained in 2005.

The Government generally decides on the use of emergency supplies. Under the Government Decree No. 279, 20.4.2006, however, drugs, medical materials and protective equipment may be released for use when the Ministry of Social Affairs and Health alone has decided that it is necessary. This allows starting of drug therapy within 48 hours in an influenza pandemic situation.

Obligatory stocks

Obligatory drug stocks refer to those owned and stored by pharmaceuticals importers and manufacturers and healthcare institutions and health centres, the quantity of which is based on legislation on obligatory stocks. The Act on Obligatory Reserve Supplies of Medicinal Products (402/84) defines the drug groups covered by obligatory stocking, as well as ancillary materials used in manufacture of pharmaceuticals and packaging materials covered by the obligation. The Decree on obligatory reserves (608/84) defines the pharmacological and ancillary materials within these groups covered by the obligation. With its annual decision (most recent 28.10.2005 NAM Reg. No. 1685/34/2005), the National Agency for Medicines confirms by brand name those pharmaceutical preparations that contain pharmacological substances confirmed by the Decree and in which such substances are crucial in terms of their medicinal significance, and with which the ancillary materials and packaging materials used in production are covered by the obligation. The decision is published on the National Agency for Medicines website (www.nam.fi).

Obligatory stocks of pharmaceutical companies and importers

Stockpiling obligations of pharmaceutical manufacturers and importers in Finland concern licensed commercial medicinal preparations. Depending on the drug group, the quantity of obligatory stocks is that corresponding to five or ten months' consumption/sales.

Imported medicinal preparations are held in obligatory stocks as end product packages. Finnish pharmaceutical producers are permitted to stock the quantity of drugs corresponding to their obligations as semi-finished products or medicinal substances, raw materials and packaging materials. Nevertheless, some domestic pharmaceutical manufacturers stock a part of their obligation as finished drug packs.

Pharmaceutical companies must inform the National Agency for Medicines at the end of each year of the quantities held in their obligatory stocks for the following year. A company is not permitted to understock its obligation without a permit issued by the Agency. Under the Act on Obligatory Reserves, a permit to understock may be granted due to a disruption

in availability, or if a preparation held in the stockpile is at risk of exceeding its sell-by date while in stock. If the sales licence of a preparation is withdrawn, running down of obligatory stocks may be started 10 months before expiry of the licence.

Obligatory stocks in healthcare institutions

Obligatory stocks in healthcare institutions only concern municipal hospitals and health centres. Private hospitals are under no obligation. The stocking obligation of hospitals and health centres is tied to the basic drug range of each unit. The criteria for selection of a basic drug range have not been defined, but the range is specific to the institution and based on the needs and drug consumption of each institution. Hospital obligatory stocks of medicinal preparations in their basic drug ranges should equal six months' consumption. Hospitals keep stocks equivalent to two weeks' consumption of base and nutritional solutions. Hospitals may understock their obligations without a permit, if releasing the stocks is essential for the operation of the institution, e.g. due to disruption in availability of the drug, but they must replenish their stocks without delay to the level of the set obligation.

11.2.2 Current situation of obligatory stocks and need for change

The total value of obligatory stocks is in excess of 100 million euros, of which the value of municipal healthcare institutions' obligatory stocks is approx. 20 million euros. Because the stocking obligation is determined on the basis of normal drug consumption, obligatory stocking does not provide long-term security of supply of drugs with little or no use in normal situations, but with significant increase is usage in emergency situations.

The legislation on obligatory stocking dates back to 1984, with most recent amendments regarding drug groups covered by obligatory stocking in 1997. Reform of the legislation is currently under way, one of the reasons being that the medicinal preparations and their quantities covered by the stocking obligation no longer in all respects correspond to modern drug treatment practices. Under existing legislation, obligatory stocks of antimicrobial drugs for sale in Finland include medicinal preparations containing amoxicillin, benzylpenicillin, doxycycline, erythromycin, phenoxymethylpenicillin, isoniazid, chloramphenicol, metronidazole, miconazole, riphampicine, cyprophloxacine, tobramycin and trimetoprime. Of medicinal preparations used today in treatment of bacterial infections, e.g. cephalosporins, anti-staphylococcal penicillins, new macrolides, new fluorochinolons and wide-spectrum beta-lactam antimicrobial agents, are missing from importers' and pharmaceutical manufacturers' obligatory stocks.

11.2.3 Purchases for emergency stockpiles

The Finnish Government has made preparations for an influenza pandemic by supplementing the emergency drug stocks with antiviral agents of the neuraminidase inhibitor group, Tamiflu (oseltamivir) and Relenza (zanamivir). 1.3 million treatment courses of the former have been ordered and 100,000 courses of the latter. In addition, Finland has placed an order for a million tablets of Atarin (amantadine).

11.2.4 Antiviral drug logistics in a pandemic situation

Since the efficacy of antiviral agents held in emergency stockpiles is conditional on its administration within 48 hours of the onset of symptoms, availability and smooth distribution of the drugs will be critical for the successful outcome of drug treatment. Appendix 9 deals with antiviral drug logistics in a pandemic situation and associated procedural suggestions.

11.2.5 Antibacterial drugs used to treat complications

Every hospital and health centre must estimate the number of patients it is likely to have to deal with during an influenza pandemic. The estimate is based on the population base, scenarios outlined in section 6.1 *Impacts on health and the healthcare system*, and regional and local preparedness plans. Hospitals and health centres must make an inventory of their existing obligatory stocks. A further estimate should be made on the proportion of hospitalised patients who are likely to require the drug treatment in oral suspension format (about 30% of under-16s and some of the elderly) and assess the adequacy of stocks in this respect, too. Antibacterial agents used to treat complications of influenza are dealt with in section 10.3.3.

If it is assumed that all patients admitted to hospital are suspected of having pneumonia and their antibacterial drug treatment is started, most healthcare units would probably need more cefuroxime for their stocks, and possibly also orally administered antibacterial drugs. It must also be noted that even if the antibacterial drugs would last over the pandemic, replenishment of stocks after the pandemic might take longer than usual. Agreement on additional supplies should be reached in regional plans. Collaboration between other hospitals and health centres in the area would also be beneficial in circulating the stocks in order to prevent drugs passing their sell-by date.

Legislation does not include obligatory stocks in companies, hospitals or health centres of dosing devices necessary for intravenous administration of drugs. Therefore, there is a possibility that dosing equipment runs out during the pandemic.

The quantities required by obligatory stocking by drug manufacturers and importers are only equivalent to five or ten months' consumption/sales, depending on the drug group, and the medicinal preparations covered by the current legislation on obligatory stocks no longer fully correspond to modern drug therapeutic practices. Therefore, in practice, the only antibacterial drugs currently capable of being utilised in a pandemic situation in outpatient treatment of pneumonia and other respiratory tract infections (see section 10.3.3) are amoxicillin (powder for oral suspension and tablets), amoxicillin and clavulanic acid (powder for oral suspension and tablets), and doxycycline (tablets). The quantity of these drugs held in obligatory stocks is insufficient to treat all the patients diagnosed with an illness as a complication of influenza, requiring treatment with antibacterial agents.

In the reform of legislation on obligatory stocks, consideration should be given to including under obligatory stocking drugs required for treatment of influenza complications caused by bacteria, such as cephalosporins, anti-staphylococcal penicillins, new macrolides, new fluorochinolons and wide-spectrum beta-lactam antimicrobial agents. With reference to obligatory stocking, procedures for securing obligatory stocks and their controlled release in a pandemic situation must be created. Furthermore, consideration should be given to inclusion in the Government reserve stockpiles of antibacterial drugs for treatment of the most common complications of influenza, both for hospitalised and outpatients (e.g. cefuroxime, first generation cephalosporin and amoxicillin and clavulanic acid), and to stocking of dos-

ing devices, either in the Government reserves or locally, for dosage of antibacterial drugs for hospitalised patients. Adequate supplies of infusion fluids must be assessed and measures considered for their inclusion in obligatory stocks.

For antibacterial drugs, the logistics follow normal practices.

11.2.6 Monitoring of adverse side-effects

The National Agency for Medicines is responsible for monitoring drug side-effects. The procedures and register currently in use are suitable for collecting information on adverse side-effects during a pandemic.

11.3 Equipment and materials

Every healthcare unit should produce an estimate, based on the above calculations, of the number of patients requiring hospitalisation, intensive care and respirator treatment it is likely to have to deal with during an influenza pandemic. These figures should be compared to available resources, quantities of e.g. respirators and other breathing equipment and oxygen stocks, and an estimate included in local preparedness plans for their optimal use and possible additional supplies needed. Using a pulse oximeter is recommended to screen patients who are likely to require intensive observation or care.

In addition to equipment and material needed in patient care, available stocks of materials required for protection of nursing staff must be assessed, such as protective clothing, gloves, face masks, mouth, nose and eye protectors, disinfectants, and their reserve stocks. In addition to healthcare burdening forecasts, these estimates are based on the basic guidelines on staff protection during a pandemic (section 10.4 Protection against infection in healthcare) Based on the estimates, adequacy of the materials in a pandemic situation should be assessed, and whether reserve stocks might be increased.

As well as assessment and purchase of materials and equipment, plans should be made on how the healthcare unit will store them. In preparedness planning, consideration should also be given to whether the healthcare unit holds reserve stocks of actual working clothing, and whether it stores protective clothing removed from normal use.

The National Public Health Institute Hospital Infection Programme (HIP) was commissioned by the Pandemic Preparedness Working Group to map the materials and equipment used to protect staff in Finnish emergency hospitals and largest health centres, and their reserve stocks, through a questionnaire compiled in cooperation with the National Emergency Supply Agency and sent to Hospital Districts at the end of the year 2005. Based on the survey results, Hospital Districts will be directed at the implementation stage of the pandemic plan in drawing up their own pandemic preparedness plans, and the necessity for national emergency stockpiling will be assessed. Materials and equipment purchases and stockpiling must take into account the target that regional organisation will vaccinate the whole population twice.

12 PREPAREDNESS FOR A PANDEMIC IN DIFFERENT SECTORS OF SOCIETY

12.1 Health services

12.1.1 Public healthcare

The Ministry of Social Affairs and Health is responsible for preparedness of healthcare services for the threat of an influenza pandemic. The Ministry is supported by the National Public Health Institute and the Advisory Board on Communicable Disease. The organisations responsible for preparedness are described in detail in section 8 and appendix 5.

The State Provincial Office ensures that Hospital Districts, health centres and municipalities in its area draw up an influenza pandemic preparedness plan, as well as coordinating, supervising and directing implementation of the plans with the help of local and national experts and taking into account special regional characteristics. The duties belonging to the State Provincial Office mandate are highlighted in crisis management and coping. In influenza pandemic prevention, the roles of social and healthcare services, veterinary disease prevention, emergency services, education authorities and transport take centre stage.

The Hospital District prepares an influenza pandemic preparedness plan for specialist nursing care, directs and supports preparedness of health centres and public and private occupational healthcare in its area, and acts as regional expert adviser on influenza pandemic preparedness.

The health centre draws up an influenza pandemic plan, covering direction to treatment, diagnosis and treatment of the disease, and organising possible vaccinations. The plan also includes operation of occupational healthcare services organised by the health centre. It must take into account available private sector resources and collaboration with private sector occupational health services. It is coordinated with other administrative organs of the local authority.

Due to the great variation in size of Hospital Districts and health centres in their areas, regional operational models may be very different. Closely coordinated collaboration of the Hospital District, State Provincial Office and health centres is required. To this end, it may be advisable to set up a regularly functioning regional influenza pandemic preparedness coordination group.

In preparing for an influenza pandemic, local healthcare preparedness plans must consider both preparedness for very large patient numbers and prevention of infection, resulting in special characteristics in existing preparedness plans and great challenges to the healthcare system in practical operations. Preparedness planning checklists in Appendices 1 *Regional and local preparedness plans for an influenza pandemic – hospitals and 2 Local preparedness plans for an influenza pandemic – primary healthcare*) are intended as aids in drawing up local preparedness plans.

12.1.2 Occupational health services

The occupational health service system provides services for employers who at their own cost must organise occupational health services for their employees. The extent of occupa-

tional health services organised and implemented must be commensurate to the needs determined by the work, working arrangements, personnel, workplace conditions and their changes. It may be implemented through either public or private healthcare.

Section 12 of the Occupational Health Care Act (1383/2001) stipulates the content of occupational healthcare. Obligations of occupational healthcare include e.g. workplace assessments, medical examinations and disclosure of information, advisory services and guidance. In workplace assessment, the role of occupational healthcare is particularly assessment of health impacts of harmful and dangerous elements. Occupational healthcare supports protection against infections, prevents infections and supports protection and promotion of safety, health and capacity for work.

Occupational healthcare helps employees and employers to internalise knowledge, skills and procedures that are important in prevention and control of infections. In addition to prevention, occupational healthcare provides information on treatment and treatment facilities.

In occupations with a particular risk of illness based on exposure, medical examinations are organised in accordance with the Government Decree on medical examinations in work that presents a special risk of illness (1485/2001). The objective of medical examinations is to ascertain the effect on the employee of factors linked to health, safety and capacity for work, and to initiate preventive and corrective measures as early as possible. The medical examination assesses the employee's state of health and work and functional ability.

The need for medical examinations and possible vaccinations is based on risk assessment of the work duties carried out in the workplace. In occupations where a risk of exposure has been identified, initial and periodic inspections must be carried out. At the medical examinations, employees needing special protective measures must be identified, the need for vaccination assessed, vaccination executed or the individual directed to an appropriate place for vaccination.

Occupational health -oriented healthcare combines medical and occupational health expertise. With nursing care, organisation of which is voluntary for the employer, information, advice and guidance are also provided.

The Ministry of Social Affairs and Health and State Provincial Offices supervise the operation and medical content of units providing occupational healthcare services and occupational healthcare professionals.

Each local authority must decide on the part played by occupational healthcare in preparedness planning and division of duties.

12.1.3 Private healthcare

In recent years, private healthcare has come to represent an increasingly large part of healthcare in Finland. Private healthcare is not under the same statutory obligation to prepare for emergency situations as public healthcare. However, State Provincial Offices may set as condition of their licensing that the premises, equipment and skills and knowledge of personnel of a private healthcare provider must be of a high standard, and that it is capable of preparedness for possible epidemics of infectious diseases.

The number of doctors in mainly private practice is 1,600, representing 10 percent of all working doctors. 770 of them work in the occupational health sector. The number of doctors with private practice as secondary occupation is 4,331, representing 27 percent of doctors. In a pandemic situation, doctors' workload is assumed to increase in their main post and the opportunity of running a private practice to decline, resulting in a possible increase in the

amount of work for mainly private doctors. In 2004, about 1.2 million surgery consultations took place in private occupational healthcare. The working age population has become accustomed to using occupational healthcare services.

The intention in 2006 is to complete the registers of private healthcare service providers and practitioners. The registers are held by State Provincial Offices, and through them, they are in contact with the private sector. The aim is to have an email network operational in 2007 at the latest, in order to facilitate contacts. Currently, they take place from State Provincial Offices partly by email and partly by post. Information may also be disseminated to private healthcare through the newly established Lääkäripalveluyritysten yhdistys [Association of private medical services].

The Ministry of Social Affairs and Health has sent a letter to State Provincial Offices, requesting them to take into account inclusion of private sector representation in regional preparedness planning.

At municipal level and in Hospital Districts, it would also be expedient to include in planning local representatives of the private sector, and to agree on division of duties and possible new outsourced services, required for primary healthcare in a pandemic situation. When issuing invitations to tender and signing contracts on outsourced services, municipalities must make sure that they guarantee security of service also in epidemic situations.

At its discretion, the Association of Finnish Local and Regional Authorities may draw up a national model for an invitation to tender and a contract.

The aim of preparedness is to be able to function as well as possible in a pandemic situation, even if the Emergency Powers Act is not yet in force. When the Emergency Powers Act is in force, the Government may, in order to secure healthcare of the population, order the body responsible for a hospital or health centre to extend or modify the operation of its institution, to relocate the operation wholly or partially outside its operational area or location, or to organise activities also outside its operational area, to place patients in the institution regardless of legislation on the matter, or to surrender its institution or a part thereof for use by the public authority. The same applies, as appropriate, also to a pharmaceutical manufacturer and wholesaler, holder of a pharmacy licence, and a community or private practitioner providing goods or services used in healthcare.

The draft for the revised Emergency Powers Act defines as emergency conditions a very widely spread infectious disease equivalent to an especially serious disaster.

2.1.4 Blood service

The Finnish Red Cross Blood Service is in charge of blood donations, provision and storage of blood preparations, and ensuring adequate supplies of different blood preparations in Finland. It should be noted that blood can only be collected from healthy persons. In order to secure the functioning of the blood service in a pandemic situation, it must obtain up-to-date information on the course of the epidemic, precise epidemic areas and suspected cases. Blood is primarily collected from areas with no diagnosed or suspected cases in the vicinity. Thus, blood service personnel may need to be granted exceptional rights e.g. based on protective measures, if movement within the country is otherwise restricted. Movement of blood service samples within the country must also be secured in emergency conditions, because testing of donated blood is centralised at the Helsinki Blood Centre. Provision of information on changes in hospital blood requirements during a pandemic is important, so that more blood is not collected than is necessary.

12.2 Social services

12.2.1 Social work

In a pandemic situation, a lot of expectations, reorganisation and work fall on social services.

Staff requirements increase considerably, if standard procedures are not modified. Reassessment of prioritisation of tasks and vulnerability of decentralised services, such as home care, is inevitable.

Social services preparedness plans must be coordinated with the area health centres and hospitals under the same planning process, in order to assess how the task may be discharged through cooperation. The preparedness instructions drawn up for social services contain no mention of an infectious disease epidemic as a threat situation; therefore, preparedness for such an eventuality must be planned as a new issue, applying the directions supplied.

Social services must draw up plans on how to execute children's daycare, child protection, home services and care of the elderly, care of the disabled, income supplement issues and other general social work in emergency conditions. Furthermore, social services are needed to organise temporary accommodation, provisions, clothing and transport for people who cannot live at home for a variety of reasons during a pandemic, or who may be quarantined during pandemic alert phases 4 or 5. Thus, the clientele may grow considerably compared to normal conditions. In addition, a significant proportion of social services staff may become ill themselves, or be forced to care for their sick child, for example. During a pandemic situation, organisation of psychosocial support and other temporary care represent qualitatively new challenges of social work.

Home nursing, home services and supported living

Home nursing patients are often also clients of social services. In most local authorities, social services care for home services clients, and in some, home nursing and care (of the elderly) have been combined as a home service. Workers assist the elderly, the disabled and sick in various daily routines. The same person may require visits from several social service workers. In the event of an influenza epidemic, illness would threaten both home service clients and personnel. The pandemic would also threaten families of home service clients, of which some are responsible for the assistance, nursing and care of home service clients. When they are sick, people living with support may need more help than usually, or they may no longer be able to cope at home. There is a possibility that some of the clients left at home with insufficient help would need temporary mass accommodation, such as institutional-type care. In that case, the situation must be assessed in terms of risk of infection.

Social services institutions

Social services institutions house elderly and disabled people. In an epidemic situation, it is likely that more long-term patients who must be moved out of hospitals and health centres need to be moved into them. Illness of those at home would also create pressure. If the epidemic spreads in the above institutions, care of the elderly, disabled and dementia patients would become very demanding. The problem to be considered would be how to organise their nursing care, when the beds of health centres and hospitals are full of influenza patients with complications. It should be borne in mind that the need for medical care must be assessed individually, even in emergency conditions.

Outsourced services

In their plans, municipalities may agree on outsourcing services from the private sector, which is increasingly active in Finland. Private social care, in common with healthcare, has no obligation of preparedness, but it should be negotiated while drawing up social services preparedness plans. The agreement should take into account continuity of the operation in a pandemic situation.

Daycare centres

Some of the children in daycare would become ill, as would some of the daycare centre staff. It is possible that daycare centres would be closed, due to spreading of the pandemic or staff sickness. In that case, daycare children need to be cared for at home or in family daycare, provided that places can be found. Then, both parents of young children would not be able to work, causing labour shortages in many sectors, in addition to sickness absences. The social services preparedness plan should consider the possibilities of e.g. utilising voluntary organisations in such situations. The situation is especially difficult when a single parent becomes ill and is hospitalised, or is otherwise unable to care for his or her child/children. Assistance from social services is then required, and the plans must make provisions for e.g. using foster families or sending the child to a relative. Daycare authorities should be instructed to gather contingency plans in advance for each child on daycare in a possible pandemic situation. Mass media should be used to urge families to plan suitable solutions in advance and when there is a threat of a pandemic. The obligation of local authorities to organise children's daycare is unchanged in a pandemic situation.

The national STAKES early child development and daycare online service Varttua (http://varttua.stakes.fi) has direct links to the Ministry of Social Affairs and Health influenza information bulletins, and via further links also to those of other ministries. Stakes also maintains a network of municipal daycare contact persons, through whom the person in charge of daycare in each local authority may be quickly reached.

Organisation of local authority services

Each local authority must take into consideration the servicing and provisioning of possible quarantine accommodation, temporary hospitals and social care institutions that may have to be set up.

Reserve personnel

The social and healthcare agencies are largely service-based, and thus very labour-intensive. Therefore, designing a reserve personnel system is challenging, and constant coordination is necessary in order to cope with the situation. For this reason, the reserve system of management must include previously trained officials who have a good grasp of the structure, planning and supervision.

Representatives of the Finnish Red Cross, Voluntary Rescue Service and workers from various churches (e.g. deacons) may be involved in the preparedness planning of social services, in addition to representatives from healthcare. They are needed for everyday work in addition to being able to participate in providing psychosocial assistance. We must consider whether e.g. students could become reserve staff after express training.

Local authorities must investigate together with the education services, whether the resources of closed schools and daycare centres could be utilised during the epidemic, both in material and personnel terms. What could healthy teachers and employees of schools and daycare centres do? How could the municipal kitchens provide meals for those who need

them? Are there sufficient supplies of disposable utensils, transport equipment and vehicles for provisions delivered to the sick? While educational institutions are closed, it may be possible to quickly train students to deliver food and for other service duties etc.

12.2.2 Psychosocial support and services

The need for psychosocial support in disaster situations has been acknowledged in Finland for ten years. MSAH has issued instructions in 1998 for emergency situations and disasters. However, they have not addressed the quality and quantity of support demanded by a widespread dangerous disease epidemic, requiring a new way of developing the issue. Nevertheless, the existing instructions provide some guidelines.

The need for support is extensive. Workers in all sectors will be overloaded in their work while some of their colleagues and family are sick. They will need to swap duties and possibly perform duties different from their normal jobs. As the epidemic progresses, there may be deaths in their proximity. Stress reactions are very likely.

Organisation of psychosocial support has traditionally been the remit of social and health services. In a pandemic situation, these services are fully occupied with caring for the sick and providing services for them. Therefore, every administrative sector should consider how psychosocial support and services are organised in their preparedness plans. Support will be needed for employees, families and colleagues of the sick and deceased, the elderly, children etc.

In addition, crisis groups of the basic and specialist services will be activated. The groups are multidisciplinary and operate across organisational and administrative boundaries. They include healthcare personnel, social workers, police officers, fire and rescue officers, and in many groups also representatives of the church.

As well as social and health service crisis groups, a considerable number of other crisis groups operate in Finland. Many voluntary organisations, the church, the defence forces, occupational health services of large companies, the police, fire services and some schools have their own crisis groups. When preparedness plans of different sectors are updated to correspond to a potential influenza epidemic in local authorities, Hospital Districts, private and public workplaces, thought should be given on the provision of psychosocial support locally in different sectors. Psychological and social peer support is important in coping with a pandemic.

12.3 Preparedness plans in other sectors of society

12.3.1 Plans and measures of the Ministries in case of a pandemic

At their meeting on 21 October 2005, Heads of Preparedness of the Ministries formed a Heads of Preparedness Group for avian influenza and an influenza pandemic. The purpose of the Group is to reinforce and coordinate preparedness for the threatened pandemic of all administrative sectors. The Ministry of Social Affairs and Health in its communication (MSAH/2899/2005/2.11.2005) asked the Ministries for a report on the measures planned and executed in case of a pandemic. The present text is largely based on this report and on updates received on comments regarding the draft pandemic preparedness plan.

Under section 40 of the Emergency Powers Act, the Government, public administrative authorities, public utilities and other public agencies and municipalities must ensure that their duties are discharged with as little disruption as possible also in emergency conditions, by virtue of preparedness plans and advance preparations of operations in exceptional circumstances and other measures. The preparedness process is directed, supervised and coordinated by the Government and each Ministry in its own administrative sector.

Each sector has made preparations for various exceptional circumstances and emergencies. The threat scenarios and procedures to be observed in preparedness are adjusted in accordance with the current threat scenario. Preparedness for avian influenza and an influenza pandemic is a part of this mechanism.

Prime Minister's Office

Chaired by the Permanent Secretary of Prime Minister's Office, the Heads of Preparedness of the Ministries have agreed on the arrangements for the Government Meeting of the Heads of Preparedness. The Office has prepared a report on questions of assignment of duties in the Government, related to avian influenza and pandemic infectious diseases.

In accordance with the policies agreed at the Government negotiation of 19.1.2006, preparedness exercises for avian influenza were organised on 9.3.2006 and for an influenza pandemic on 20.4.2006.

The Government situational picture reporting has monitored the avian influenza situation, and the possible development of the situation into an influenza pandemic has been noted in planning the situational picture operation. The Government Communications Unit has coordinated issues related to communications at regular meetings of the Ministries' Heads of Communication.

The vital societal function of Prime Minister's Office is governance of the nation. Its ability to lead in a pandemic situation has been ensured by arrangements for replacements for key persons in decision-making, its preparation and in communications.

Ministry for Foreign Affairs

The Ministry for Foreign Affairs and Finland's 97 foreign diplomatic missions are responsible for protecting Finnish nationals outside Finland's borders. Their duties include drafting of pandemic preparedness plans for each country and mapping of the current alert situation for the safety of Finnish residents and tourists in the country. MFA and Finland's diplomatic missions also collect and analyze pivotal information required to form a situational picture in each country, in support of decision-making by the national Government. If a global pandemic spreads, it is the duty of the foreign affairs administration to protect the interests of Finland and Finnish citizens in an altered international situation. This may also mean diplomatic means of safeguarding Finland's security of supply and the safety of the citizens.

The Ministry for Foreign Affairs has drawn up a plan of preparedness measures of the foreign affairs administration in 2006. The Ministry's diplomatic missions represent the whole national Government and are in the front line in crisis situations possibly arising in foreign countries. South-East Asian missions in particular have been directed to draw up individual preparedness plans. Guidelines have been issued regarding occupational health and safety of diplomatic mission personnel in case of an influenza pandemic.

At the Ministry for Foreign Affairs, pandemic preparedness is coordinated, and operations led in a potential pandemic situation, by the Ministry Preparedness Group chaired by the Head of Preparedness. In addition to those mentioned above, crucial officials in terms of continuity of the functions of the administrative sector include the other senior officials

of the Ministry, persons working in consular and communications duties as well as passport and visa functions, and employees of the regional Departments and those of the Security Unit and occupational health and safety, who are responsible for the security of personnel. Persons maintaining data communications systems are also crucial for functional continuity.

The Ministry for Foreign Affairs estimates that even a possible epidemic, with up to a quarter of the staff temporarily sick, would not result is serious shortcomings in terms of the Ministry resources, as its organisation and operational culture are fundamentally founded on change and multi-skilling. The Ministry has 1,600 direct employees and 900 workers employed from the various foreign base countries. Most of the personnel have lengthy experience abroad, and they are accustomed to stepping into other duties, if necessary at short notice, if priorities and functional capacity require it. If the duration of the sickness was no more than two weeks and everybody was not sick at the same time, it is unlikely that the functions would come to a total standstill.

Diplomatic missions

In a pandemic situation, the greatest threat would concern foreign diplomatic missions with access to limited resources. Therefore, efforts are made to prepare as well as possible in advance for a possible influenza pandemic. Diplomatic missions in the South-East Asian risk area have been asked to update their preparedness and evacuation plans, taking into account measures required by a possible influenza pandemic and continuity of functions, including provision of consulate services, during a pandemic. Among other things, this means that diplomatic missions have pre-planned the division of duties and responsibilities in the event of a pandemic situation. The plans include e.g. possible restriction of customer services (especially immigration services) and restriction of activities, such as moving over to distance working. In addition, the diplomatic missions are investigating the preparedness of local hospitals for diagnosing infections and treatment of foreign nationals in a possible pandemic situation.

The Ministry has set up consulate secondment corps, acting as additional resources to be dispatched to diplomatic missions if necessary, if an epidemic or some other external disruptive force unexpectedly jeopardised their operation. On the other hand, in a contagious disease situation, careful consideration would need to be applied as to the expediency of sending healthy employees to an infection area.

Safeguarding the health of personnel

The entire personnel, including family members in risk areas, have the option of free seasonal influenza vaccinations. Although the vaccination affords no protection against avian influenza or pandemic influenza, it facilitates diagnosis during a possible pandemic.

In addition, employees and family members of South-East Asian and South-East European (Turkey) countries with cases of transmission of avian influenza to humans have been sent supplies of the drug Tamiflu. These missions have also been permitted to purchase the drug locally for personnel employed from the base country, which most have taken up. The Ministry holds a small stock of drugs in its occupational healthcare facility.

Situational analysis and associated measures are based on analyses and recommendations by WHO and NPHI. The situation is constantly monitored and directions issued, as the situation changes.

International cooperation

The Nordic countries and EU countries cooperate closely in the field of crisis preparedness, which also includes preparing for a possible influenza pandemic. The countries exchange information on their measures, including their pandemic preparedness and evacuation plans. If the pandemic threat increases significantly, both the Nordic and EU collaboration will play a central role e.g. in organisation of possible evacuations. Exercises for pandemic situations are also organised within the framework of EU coordination. The first pandemic exercise of EU countries was held on 24. –25.11.2005. The Ministry for Foreign Affairs took part in the exercise.

The foreign affairs administration coordinates Finland's cooperation in international organisations, such as UNDP, WHO and the World Bank. One of the functions of the cooperation is reinforcement of veterinary care and healthcare capacity in countries where the situation is the most critical in terms of pandemic prevention.

On 17.–18.1.2006, the International Pledging Conference on Avian and Human Influenza was held in Beijing, where international financing needs were assessed and a communal funding framework established in order to alleviate the impacts of avian influenza. A total of 1.9 billion dollars in aid was pledged. Finland has pledged 2.7 million euros for a two-year project coordinated by UNDP in Vietnam. Other necessary cooperation is being assessed.

Information bulletins for travellers and advisory services for expatriate Finns

The travel information bulletins published on the Ministry for Foreign Affairs website are based on close monitoring of developments related to the pandemic in base countries. Recommendations to avoid travel will probably be issued at the prepandemic phase. However, the current expert opinion is that travel restrictions have no discernible effect during the pandemic phase.

The EU countries have agreed to monitor the disease situation closely also from the perspective of travel information, and that bulletins are coordinated in accordance with the current situation.

Diplomatic missions pass on the information based on expert sources they have received from the Ministry also to Finnish nationals resident abroad (an example is the MFA and NPHI information bulletin published on the Ministry for Foreign Affairs formin website, and which missions have been able to publish at their discretion on their own websites or send to mailing lists).

These measures are intended to secure continuity of foreign affairs administration and the safety and welfare abroad of Finnish nationals and foreign nationals permanently resident in Finland, including in a possible pandemic situation.

Ministry of Justice

For the most part, pandemic preparedness and prevention is a matter for the EU member countries. National measures implemented in order to prevent the spread of the disease may be such in nature as to clash in principle with EU law. Assessment of the limitations set by EU law is the duty of each Ministry in its own administrative sector. However, EU law recognises the prospect of so-called precautionary measures in emergency circumstances in several sectors. This means that EU regulation does not prevent measures that are justified e.g. in order to protect human health and life (e.g. articles 30, 39, 46 and 95 of the EU Treaty).

The current Emergency Powers Act (1080/1991) came into force on 1.9.1991. Its purpose is to secure the livelihood of the population and the country's economic system under emergency conditions, to maintain law and order, constitutional and human rights, and to

secure the territorial integrity and independence of the nation. The Emergency Powers Act section 2 defines emergency conditions, dividing them into five groups. They refer to serious crises, not including a pandemic, however. Thus, the current Emergency Powers Act could not be invoked in a pandemic situation, but legislation for normal conditions would have to be applied, particularly the Communicable Diseases Act (583/1986). If the country's economic situation was weakened due to a pandemic, invoking the Emergency Powers Act may be considered. From healthcare point of view, however, this would be rather late in the day.

The draft for the new Emergency Powers Act (Ministry of Justice KM 2005:2) defines as emergency conditions "a very widely spread dangerous infectious disease with impacts equivalent to those of a particularly serious disaster" (section 3 subsection 4), thus, a pandemic would be considered an emergency condition and the Emergency Powers Act could be applied. The proposed revised Emergency Powers Act contains the following powers for additional measures which could be implemented:

- regulations on securing social and health services (sections 84 and 85)
- regulations on exceptions to terms and conditions of employment (section 91 subsection 2)
- regulations on persons subject to obligation to work (section 93 subsection 2).

The Ministry of Justice has drafted a proposal for a new Emergency Powers Act, likely to be submitted to Parliament in the Government term beginning in 2007.

Structure of the Ministry of Justice administrative sector

A typical feature of the Ministry of Justice administrative sector is that the judicial system, prosecution service and other units are rather small, usually from a few officials to a few dozen. It is therefore evident that pandemic preparedness of the administrative sector requires support measures and special arrangements. Some of the sectors have a central authority, such as the Criminal Sanctions Agency and the Office of the Prosecutor General, but with others, the central organ is the Ministry of Justice.

Preparedness in the Ministry of Justice administrative sector

The judiciary system, legal aid and debt recovery

In the operation of the judiciary system, an emergency situation would hamper the work of the courts and prosecutors. The time taken to hear cases would increase, and the pandemic may add to the backlog of cases. Since it may be assumed that the indisposition rates of parties to court hearings would be similar to those of staff, prosecutions and hearings will need to be postponed to some degree in any case, regardless of official measures.

In order to safeguard the prompt discharge of judicial matters, implementation of constitutional rights and security of justice, it is important that urgent matters, such as hearings on enforced measures, can be attended to without delay, regardless of staff shortages. This necessitates flexible deputising arrangements in courts, and possible deputisations implemented by cooperating area in the prosecution service. Continuity of the work of the senior civil servants of the agencies and their deputies is important in order to safeguard appropriate use of personnel.

The enforcement authorities should be able to deal with at least urgent security measures.

Prison services
The greatest problems caused by a pandemic would be in prison facilities. In closed institutions, prevention of the spread of influenza among both prisoners and guards would be especially challenging. The prison service has a dedicated healthcare organisation, which nevertheless is rather too lightweight for coping with and prevention of a pandemic.

A pandemic may necessitate changes also in prisoners' rights, such as restriction of contacts or other measures designed to prevent the disease from spreading.

The Ministry and other services
In cases of a possibly prolonged pandemic or one with more significant impacts than anticipated, it may be necessary to amend legislation quickly. In such a case, legal drafters of the Ministry of Justice are crucial.

Owing to their key duties, the authorities overseeing legality should be able to continue their duties even during an influenza pandemic.

Communications
Highly efficient communications are pivotal in an emergency situation. The Ministry of Justice and the central offices of the sectors carry the main responsibility for dissemination of information both within the sector and to the general public. Each office takes care of local client communications. In the area of communications, directions on effective communications are observed.

Ministry of the Interior
On 19.10.2005, the Ministry of the Interior set up an internal working group with the remit of drafting the preparedness measures of the administrative sector in the event of an influenza pandemic. The working group comprises representatives of all departments and the Press and Communications Services. The International Security Affairs Unit, under the leadership of the Minister of the Interior, addresses influenza pandemic preparedness regularly.

The Ministry of the Interior administrative sector has been urged to prepare in its operative function for the possibility that in an influenza pandemic situation, 25-35 percent of the personnel may be absent from work, due to their own illness, for 1-2 weeks over about 2-3 months.

Department for Rescue Services
The Department for Rescue Services has sent a letter of instruction on preparedness for an influenza pandemic to its administrative sector on 13.12.2005. The administration has been urged to consider an influenza pandemic in its preparedness plans. During a possible influenza pandemic, the Rescue Services areas and emergency centres have been instructed to report any changes in capable human resources and on operational problems. Preparedness for an influenza pandemic is to be included in future preparedness exercises. The exercises must be used to evaluate preparedness and functioning in an influenza pandemic situation, the content of directions and their sufficiency, and issues related to cooperation of different authorities.

The Emergency Services College has been instructed to be prepared to interrupt vocational training and short course activities altogether.

Police Department
The Police Department has sent its administrative sector an information bulletin on 1.12.2005

on preparedness for an influenza pandemic. The bulletin urges local preparedness for an influenza pandemic and to consider the following in their planning:

how to secure functionality of the leadership system and what plans are in place to safeguard senior positions;

- who are the key persons of the unit and how are possible deputies ensured for them;
- what are the practical resources of police units for cooperation with the municipal sector and Hospital Districts;
- how to be ready to collaborate with other authorities;
- how to be prepared for the possible closure of the whole police station or other unit;
- what are the budgetary plans of the unit in the event of a crisis.

One of the items on the agenda of influenza pandemic preparedness is organisation of extensive local, provincial or countywide exercises.

Border Guard Headquarters

The Border Guard Department has issued a memorandum "Lintuinfluenssa ja rajavartiolaitos" [Avian influenza and the Border Guard Department] on 4.11.2005. Under the memorandum, the Border Guard Department is prepared, if required, to implement short-term personnel transfers to ensure that operative leadership, border inspections and maritime rescue services are maintained in an influenza pandemic situation. With reference to conscripts undergoing their national service in Border Guard Companies, preparations are made to decide at the time of an influenza pandemic outbreak, whether the date of commencement of national service is to be postponed, whether national service is to be suspended for the duration of the influenza pandemic, or whether the conscripts are treated in the garrisons.

Department for Development of Regions and Public Administration

In an influenza pandemic situation, State Provincial Offices play a central role in implementation of regional and local preparedness and preventive measures, under the direction of the Ministry of Social Affairs and Health, Ministry of Agriculture and Forestry and Ministry of the Interior. State Provincial Offices also have a general role in preparedness for emergency conditions, and the standard procedures and organisation created for the purpose are also utilised in influenza pandemic preparedness. State Provincial Offices' preparedness measures have been discussed at Governors' meetings.

Each State Provincial Office makes its own preparations for these situations and coordinates preparedness in its area. Cooperation will be improved, especially with Hospital Districts. Provincial preparedness committees discuss the issue regularly and include an influenza pandemic in their situational pictures for exercises.

State Provincial Offices communicate proactively with regional and local authorities, and make use of e.g. the information on the National Public Health Institute website. Material produced by the preparedness working group of the Ministry of the Interior is sent to Governors. The whole personnel of the administrative sector is kept informed in accordance with the common Ministry of the Interior communications plan. When the national plan is completed, the required measures will be addressed.

Immigration Department

The Immigration Department issued a memorandum on 11.11.2005, entitled "Ulkomaalaist-

en maahantuloa, maassa oleskelua, maassa liikkumista ja maasta poistamista koskevat säännökset kansanterveydelliseltä kannalta katsottuna" [Regulations on entry of foreign nationals into the country, their stay, movements within the country and removal from the country from the public health perspective]. A letter has been sent to the Directorate of Immigration, outlining the operation of the National Working Group for Pandemic Preparedness and the Ministry of the Interior working group, and urging the Directorate to take into account the risk of a pandemic in its own preparedness plan. Particular attention should be paid to appropriate protection from infection of those working in customer service and conducting interviews, as well as how the work should be organised and prioritised, if a significant proportion of the personnel is on sick leave. No internal border controls are carried out in the Schengen zone, but they may be temporarily reinstated due to a possible threat to public health.

Department for Municipal Affairs
The Department for Municipal Affairs has issued a memorandum on 17.11.2005 entitled "Toimenpiteet kuntaosaston toimialalla pandemiaan varautumisessa" [Pandemic preparedness measures in the administrative sector of the Department for Municipal Affairs]. The Department is drafting guidelines for municipal management on preparations for a possible pandemic.

Press and Communications Services
The Ministry of the Interior Press and Communications Services are preparing the administration's own communications plan, and taking part in drafting of the authorities' shared communications plan. The Press and Communications Services have issued a memorandum "Influenssapandemiaan varautumiseen liittyvä viestintäsuunnitelma" [Communications plan for influenza pandemic preparedness]. The Service has included information on the influenza pandemic in online forums, references to which may have been included in information bulletins sent to the administrative sectors.

Ministry of Defence
The Ministry of Defence has set up a defence administration avian influenza – influenza pandemic expert working group on 13.3.2006. The working group is investigating measures incurred by both the threat of avian influenza and an influenza pandemic, both in relation to operation of the defence administration and support required from it by the rest of society. The working group monitors the situation and planning of central government and issues recommendations on measures within the defence administration.

Medical preparedness in the Defence Forces is the remit of its chief medical officer, assisted by the Defence Staff Logistics Division and the Research Institute of Military Medicine. The Medical Division has issued its operational instructions on influenza pandemic preparedness.

The Defence administration preparedness plan was drawn up during March 2006. The plans for each sector and subsector were drawn up during 2006.

In an influenza pandemic situation, the defence administration will continue to maintain its operational conditions in order to fulfil its statutory duties, as well as being prepared to support functions of society by providing executive assistance. To secure the functional capacity of our own staff, the plans take into account both conscripts, employed personnel of the defence administration, crisis management troops, and collaborative and stakeholder groups.

Principal interfaces of the defence administration in an influenza pandemic situation:

- cooperation with authorities at different levels
- exchange of information between authorities
- healthcare measures and arrangements
- formation and dissemination of situational picture
- preparedness for providing executive assistance

The defence administration preparedness plan outlines the scenarios and assessments of the development of the situation, and measures to be taken by the administration on the basis of the scenarios. The scenarios describe preparedness, measures and collaboration of the defence administration during influenza pandemics of different degrees of severity, extent and speed.

Continuity of the vital functions of the defence administration has been secured, as well as the efficient use of the their support systems, personnel and skills resources. The operative leadership of the Defence Forces will issue orders on review and implementation of operational plans, if an influenza pandemic alert should make it imperative. The Defence Staff is monitoring the development of the influenza pandemic situation and the need for action. The leadership of the defence administration is kept informed of developments of the situation.

The Defence Staff has made assessments of burdening, impacts and necessary premises and healthcare personnel in a pandemic. Detachments have been issued with criteria for assessing the impacts of sickness absences and on improving preparedness of the medical services. Deployment of conscripts, their tasks and possible changes of service periods and leave will be assessed together with healthcare authorities.

The defence administration has collaborated in its planning with experts from the Ministry of Social Affairs and Health, National Public Health Institute, Ministry of Agriculture and Forestry, Ministry of the Interior, and the Headquarters of the Border Guard. A representative from the defence administration participated in the National Working Group for Pandemic Preparedness and collaborates with MSAH and NPHI. The Defence Forces have taken part in national and international exercises in 2005 – 2006.

Ministry of Finance

The administrative sector of the Ministry of Finance drafts the Government economic and fiscal policy and operates as the authority on taxation policy. The Ministry is also responsible for drafting financial markets policy. Operation of the Ministry of Finance will not be affected by the possible rapid and widespread progress of a pandemic.

In the administrative sector of the Ministry, a pandemic situation may cause disruption in the taxation process, due to possible cases of sickness of data processing personnel. The basic functions would continue at an impaired standard, and any resulting errors would be corrected once the situation has returned to normal. Procurement and management of Government funds and paying out of pensions may be affected in a pandemic situation as the consequence of possible absence of key personnel.

The whole Customs organisation would become overloaded by a pandemic, especially with the assumption that some of the staff are prevented from coming to work due to sickness. For example, if border inspections are tightened because of the pandemic, this means transferring staff from other duties to border control. Maintaining the smooth operation of tax collection and foreign trade is an important issue for society under all circumstances.

The organisation of the Customs would be capable of performing its customary basic

functions. However, this would mean prioritisation of duties and overtime. If, for example, more detailed border inspections, taking of samples or executive assistance duties become necessary due to avian influenza, all employees will be needed. Staff with expertise in certain specialist tasks (e.g. IT, payroll, small customs posts and certain expert duties) number so few that the simultaneous sickness of several people may seriously impair continuity of functions.

In Finland, customs officials have an important role and position in supervision of regulations concerning veterinary medicine and plant health.

The Government budget of 2006 includes a contingency fund of five (5) million euros to cover unforeseen expenditure of the Ministry of Finance administrative sector.

Ministry of Education

The Ministry of Education influenza pandemic preparedness plans focus on the activities crucial for the vital functions in the Ministry's administrative sector, which include securing the operation of education and research, cultural, sport and youth policy, and arrangements for psychological crisis aid.

Preparedness in communications

A functional and adequately resourced communications system is quickly able to respond to the needs of enhanced communications. The Ministry of Education is currently drafting a crisis communications plan to secure its preparedness. The offices and agencies of the administrative sector are drafting corresponding plans and updating possible existing plans. In a pandemic situation, the National Board of Education and State Provincial Offices are central actors also in communications.

Collaboration with civic organisations ensures extensive dissemination of information and education.

Education and science policy sector

The Ministry of Education education and science policy sector covers pre-school and basic education, schoolchildren's morning and afternoon club activities, upper secondary education, vocational education, adult education, and polytechnics and universities. The number of full-time pupils and students in Finnish pre-school and basic education, upper secondary, and adult upper secondary education, vocational education and vocational further education is more than a million (2004 figures). Polytechnics have about 140,000 students and universities about 177,000. Measures brought about by an influenza pandemic concern a total of about 1,900,000 pupils, students, teachers and other staff of educational institutions.

The legislation does not contain statutory powers of suspending education or closing educational establishments or training units in case of a pandemic. Thus, the stipulations of sections 14 and 15 of the Communicable Diseases Act (583/1986) would apply.

In a crisis situation, maintaining telecommunications and data communications links and participation in the necessary research and surveillance during a pandemic are important. Securing of functional data communications also compensates for possible other adverse effects caused by illness of university staff and students.

The aim is that teaching can be carried out through various arrangements also during an influenza pandemic. Under section 4 of the Basic Education Act, the local authority is obliged to organise pre-school and basic education. According to section 23 of the Basic Education Act, the school year starts on 1 August and ends on 31 July. The school year has 190 days.

The teaching arrangements would be implemented e.g. via production and distribution of distance learning material, contact teaching via Finnish Broadcasting Company (YLE) channels and online teaching. The responsibility for planning and implementation rests with the Finnish National Board of Education, regional and local authorities and education providers. Organisation of the school matriculation examination and entrance examinations demand special arrangements, depending on the situation.

All the agencies and units of the Ministry of Education administrative sector contain large numbers of people at the same time. During a pandemic alert, albeit low at the moment, preparation of a programme of preventive action would be necessary for the higher education system and at the same time for the executive organisations of the whole education sector.

The programme should consider

1. prevention of infection both on individual level (e.g. improved hygiene) and on unit and organisational levels;
2. preparation of a programme of preparedness measures to be disseminated to all levels, to ensure both preventive preparedness and that of crisis situations;
3. uniformity of operational principles, or that uniform operational principles exist in case of a crisis situation, with a previously issued 'everyman's guide' in use. When e.g. in universities and schools, students and teachers are not present in their places of study or work at a set time, as is the case in customary workplaces, access to information may be inadequate and cause unnecessary risks.

Church affairs

In a pandemic situation, the importance of spiritual care is highlighted in the activities of religious communities. The work may be hampered by sickness of the personnel and possible restrictions on gatherings. Evangelic-Lutheran parishes are also obliged to maintain public cemeteries. With certain special arrangements, parish funeral services are believed to cope with a pandemic situation. If the circumstances dictate, funeral procedures may diverge from the regulations of the Funeral Services Act, under its section 25.

Culture, sports and youth policy sector

The Ministry of Education administrative sector of cultural policy covers the national cultural and arts institutions, museums, theatres and orchestras receiving Government funding and subsidies, municipal cultural activities and libraries, and societies, associations and civic organisations in receipt of public funding. The Finnish sports and recreational sector is largely based on civic activity. The civic sporting activity is organised at national, regional and local levels. Organisers of public sporting events are usually sports associations. With regard to youth services, which are also mainly civic activities, our basic tasks are e.g. provision of financial support for youth organisations and those involved in youth work, assisting national youth centres, developing workshop activities for young people, supporting after-school activities for schoolchildren, and cultural activities for children and young people.

In the event of an influenza pandemic, regulation of public events would be under the stipulations of the Communicable Diseases Act (1986/583; §14) and the Assembly Act (1999/530; §15).

Ministry of Agriculture and Forestry

In the administrative sector of the Ministry of Agriculture and Forestry, central areas in terms of vital functions are prevention of veterinary diseases and securing primary production of other foodstuffs, water services, safeguarding the quality and safety of foodstuffs, and management of safety of dams and flood risks. In terms of preparedness, the critical elements to be maintained include veterinary surgeons' duty roster systems at all administrative levels, particularly the exercises and equipment of preparedness vets trained in prevention of veterinary disease, as well as the diagnostic resources and duty rosters of the Finnish Food Safety Authority (Evira). In a disease situation, the critical factor is personnel resources at the various levels of the official veterinary practitioner system.

The sector has prepared for avian influenza through enhanced preparedness for a dangerous infectious veterinary disease as a part of normal activities of the veterinary authorities. The Ministry, and at regional level the State Provincial Offices, have drawn up detailed operational instructions for veterinarians in case of avian influenza. Preparedness of the veterinary practitioner system in prevention of veterinary disease epidemics was the subject of a pan-Nordic foot and mouth disease exercise covering all administrative levels in September 2005.

The Finnish Food Safety Authority (Evira) researches avian influenza antibodies in poultry and incidence of the virus in wild birds, as well as mapping the risk factors of avian influenza. In a case of a disease cluster on a poultry farm, spread of the disease is prevented and the disease eradicated in accordance with the Ministry of Agriculture and Forestry Decision on Control of Newcastle Disease and Avian Influenza (3/EEO/96). If necessary, a decision will be made on emergency vaccination of poultry. The sector is prepared for transmission of avian influenza to humans and a possible new pandemic with human-to-human transmission, in cooperation with the Ministry of Social Affairs and Health.

The Customs and other relevant parties have been informed on import bans imposed on poultry and foodstuffs posing a potential risk of infection. Import licences for caged birds from infected areas are not granted.

The MAF Press and Information Unit has prepared a communications plan in case of avian influenza, and maintains a communications code of practice for crisis and emergency situations. In addition, MAF maintains a constantly updated avian influenza website on the Internet.

The pandemic alert is also considered in the other functions of the Ministry administrative sector. For vital functions of society, smooth operation of the food supply is crucial. Improved preparedness planning is also under way in order to safeguard management of flood risks and dam safety, and water supplies of communities.

Ministry of Transport and Communications

The administrative sector of the Ministry of Transport and Communications covers the functions of many vital infrastructures of society, either directly or indirectly. An important element is transport, the smooth functioning of which impacts both on supplies for the citizens and securing foreign trade. Many other social functions depend on data communications systems. Without operational communications links, many of society's basic functions are at risk of disruption or complete shutdown. This would mostly have a serious impact on society.

In the administrative sector of the Ministry of Transport and Communications, possible rapid and widespread progress of a pandemic may bring about a situation with serious consequences for functioning of society. According to the assessment carried out by the Ministry, the persons in key positions, for whom it would be difficult to find replacements, include

e.g. drivers of various means of public transport, production personnel of the Post Office, as well as the personnel of telecommunications companies.

In transport, e.g. energy and food deliveries are executed with particular efficiency, and they require the kind of special know-how that is not easily replaced. Personnel in traffic management is specially trained. They use complex information systems.

Preparedness plans for specific situations are mostly combined with normal preparedness planning. Under normal procedure, reviewing and updating of preparedness plans is carried out annually. In the administrative sector of the Ministry of Transport and Communications, the nature of operative activity also includes plans for cover arrangements.

The management of the Finnair Group has made decisions on allocation of responsibilities regarding surveillance of the situation and preparedness in case of an influenza pandemic. Furthermore, a separate preparedness plan covering 13 subject areas has been drawn up. The Ministry and the sector organisations have the preparedness for immediate instigation of measures to reinforce preparations in case of a pandemic, should the situation demand it.

Ministry of Trade and Industry

In the administrative sector of the Ministry of Trade and Industry, one of the key areas of its recent preparedness work has been reviewing of the foundations of preparedness planning. Due to a constantly changing operational environment, the Ministry has focused on reviewing of the foundations of preparedness planning in its own sector. The most important of them include amendment of the Act on Safeguarding Security of Supply and the scope of application of the concept of security of supply contained therein from 1.10.2005 to correspond, in addition to emergency conditions, also to comparable serious disruptions (L 688/2005), drafting of the new organisation of the National Board of Economic Defence and the bases of planning (new threat scenarios, sector-specific goals) for the period 2004–2008 in cooperation with the National Emergency Supply Agency, as well as drafting of a new, more comprehensive code of practice for preparedness planning for Employment and Economic Development Centres, carried out with the Committee for preparedness issues (includes MTI, MAF, MOL, EED Centres).

At the same time, several Government level preparedness projects (e.g. work on strategies for securing vital functions of society or VFS, the preparedness exercise of 2005, the EU pandemic exercise, review work of the Emergency Powers Act, and the Government real-time situational picture project), in which the Ministry of Trade and Industry has also been involved, are expected to increase the resources of the administrative sector (including collaboration) in responding to the new threat scenarios of the present day. In connection with this work, the Ministry has carried out assessments of its own vital functions and personnel arrangements, and those of its administrative sector. The assessments are reviewed regularly.

The National Emergency Supply Agency, one of the agencies under the Ministry of Trade and Industry, has ordered 1.3 million doses of influenza medication for its reserve stocks in case of avian influenza. In addition, the National Public Health Institute has signed a five-year advance reservation agreement for specific vaccine with a Dutch influenza vaccine manufacturer in December. Under the agreement, it undertakes to supply Finland with 5.5 million doses of specific vaccine targeted at the pandemic virus, in the order of agreements, as the vaccine production progresses. Finland is the fourth in line. The National Emergency Supply Agency is liable for the reservation fees for the first two years.

The Employment and Economic Development Centres autumn 2005 range of training courses included ‘Communications of EED Centres in emergency situations’ with an avian influenza situation as its exercise theme.

Under the Act of Safeguarding Security of Supply (1390/1992), it is imperative under all conditions to create and maintain sufficient resources to produce commodities and to manage production, distribution, consumption and foreign trade, in order to ensure security of supply. The Ministry of Trade and Industry is ultimately responsible for security of supply.

The Government set general targets for security of supply (GD 350/2002), defining the level of preparedness, taking into account the minimum requirements of the population and essential economic life, as well as national defence. Under the Government Decision 350/2002, the fundamental supply sectors, to be safeguarded in order to assure security of supply, are the basic technical structures of society, transport, storage and distribution systems, food supplies, energy supplies, social and health services, and production and maintenance of systems supporting defence of the country. In accordance with the Government policy decision on safeguarding vital functions, the strategic tasks allocated to the Ministry of Trade and Industry include energy supplies, food supplies (partially), and industrial and service production. Key actors for security of supply and administration are the key personnel in energy production and distribution, food production, trade and distribution, vital industrial and service production and the agencies.

Practical implementation of security of supply is based on collaboration between public authorities and the business sector. In this sense, the National Emergency Supply Agency and the National Board of Economic Defence (NBED) are administratively under the MTI. The NBED Central Section decided in its meeting on 1.12.2005 to send an influenza pandemic preparedness code of practice to the NBED sectors and pools, and also to the managements of companies in the highest category of importance (about 1,300). The code of practice is based on the Ministry of Social Affairs and Health definition of measures. The sectors and pools have been requested to note the code of practice, and if necessary, to improve the distribution and to provide additional guidelines to companies. The code of practice is also published on the National Emergency Supply Agency website, for general use for companies' risk assessment and preparedness schemes.

The purpose of the code of practice is that companies should consider the threat of avian influenza and pandemic in their own risk assessments. The threat becomes a part of normal operational risk analysis, and therefore its impacts are considered in terms of overall company operation. Thus, attention is paid to the possible effect of the threat on raw material supplies, maintaining essential operational processes during extensive sickness of personnel, ensuring end product safety, reactions of the markets, customer information etc. NBED organises sector-specific training and exercises as required.

The National Emergency Supply Agency, as a secretariat of NBED, is in constant contact with private and public sector actors covered by NBED organisation (e.g. daily consumer goods supply, oil and electricity supply sectors), monitoring the status and development of preparedness. It has been found to be developing well. Furthermore, the National Emergency Supply Agency has agreed that the Government Institute for Economic Research (GIER) has applied the input-output model to run macro-economic forecasts on impacts of employee absences (See Section 6.2.).

As part of the normal public sector preparedness obligation, the Ministry of Trade and Industry administrative sector has the resources to secure the essential functions of its offices and agencies in an influenza pandemic situation. As part of its normal operation, the Ministry Media and Communications Services cooperate with the corresponding services of other Ministries and those responsible for communications in their administrative sector, and is prepared to enhance communications services as required.

Ministry of Labour

The vital function of the labour administration also in a pandemic situation is to assist other sectors in procuring and directing labour, in order to secure their vital functions to society (VFS). The point of departure in securing the functions of society is that all administrative sectors in their preparedness plans have noted appointing of their VFS personnel, organisation of operations, transferring labour from less important tasks to VFS duties, etc. The labour administration has attended to this issue in the preparedness plans of the Ministry and Employment Offices.

In accordance with preparedness plans, the labour administration has drawn up codes of practice and organisation: the processes of directing the labour force have been defined, less important work will be suspended as dictated by the situation, arrangements for reserve personnel thought out, and agreements drawn up on extended shifts and shift work arrangements. In addition, the administration's internal communications will be improved and communications preparedness raised so that every Employment and Economic Development Centre and Employment Office has an appointed person responsible for communications. The labour administration estimates that arrangements under these plans are sufficient to secure its VFS functions, even if 25-35 percent of employees were sick during the pandemic waves.

Procuring extra healthcare personnel is the responsibility of the Ministry of Social Affairs and Health, and the Ministry of Labour will provide assistance under its own plans. Employment Offices will designate certain person already familiar with the sector to take special charge of recruitment of healthcare personnel, and the operation will be centralised to larger offices with healthcare institutions in their area.

Safeguarding of the own operation of the labour administration also includes securing of staffing for reception centres and their operation. In this respect, we would be forced to rely on voluntary labour and help from e.g. Finnish Red Cross.

Ministry of the Environment

The preparedness measures of the environmental administration focus on maintaining its ability to function during an influenza pandemic. In addition, the administration is prepared to provide expert assistance to other sectors, e.g. in issues related to water services, treatment of effluent and waste management.

The Ministry of the Environment will ensure that its offices and agencies (Finnish Environment Institute and Regional Environment Centres) are in possession of sufficient information in order to avoid the environmental risks possibly arising in a pandemic situation. In addition, the Ministry will make the necessary decisions and issue directions to the administration under it. The Ministry of the Environment has put into place deputising arrangements in case of a possible pandemic, particularly for critical functions. In a pandemic situation, particularly important key persons and professional groups are the leadership of the Ministry and their secretaries, employees in IT management, those working with environmental risks and prevention of damage to the environment, the EU cooperation group and communications personnel. The reliability and efficiency of the environmental administration's own communication channels will be assessed and secured as well as possible in advance, for a variety of eventualities.

Maintenance of the basic information technology infrastructure in the offices and agencies of the sector is ensured through cooperation between the Finnish Environment Institute, West Finland Regional Environment Centre (Vaasa) and the Ministry of the Environment.

Under the Environmental Administration Act, the Ministry of the Environment is pre-

pared to assign the Environment Institute to discharge duties outside its sector and to order other assignments (section 3, subsection 1 and section 4, subsection 3). The preparedness group of the Finnish Environment Institute will review the adequacy of deputising chains and other preparedness. If necessary, the Finnish Environment Institute will make special arrangements for discharging critical functions, including surveillance of environmental damage and related prevention of oil and chemical accidents, expert assistance in water supplies, maintaining basic information technology infrastructure in environmental administration, and issues related to boundary waters regarding regulation of Lake Inari and drainage from Lake Saimaa. The key issue to consider is securing the functions of persons in critical positions in Regional Environment Centres. Such persons are the directors and unit managers, as well as persons in expert capacity who provide consultative services to other authorities, for example in the event of an environmental accident.

The Environment Centres direct and supervise management of water supplies (drinking water and waste water issues) and waste management in accordance with the conditions and stipulations of environmental permits. The Environment Centres give priority to the critical function of their operation, including direction and surveillance, monitoring and reporting on the state of the environment, maintenance of a situational picture, provision of information (in support of national communications) and cooperation in the area.

12.4 Other organisations and voluntary activities

12.4.1 Finnish Red Cross

The Finnish Red Cross (FRC) ensures its ability to assist and continuity of its activities under normal conditions, disruptions to normal conditions and in emergency conditions. FRC applies the same operational principles in its preparedness as the authorities and public organisations. FRC maintains material preparedness and provides preparedness training. The purpose and regulations of the operation of FRC have been enforced by the Act on the Finnish Red Cross (238/2000) and a Decree (811/2005).

FRC is organised in 12 districts and 593 branches. Every branch has a contact person responsible for raising the alarm in sudden accidents or other emergency situations in Finland.

The members include healthcare professionals who may be utilised to educate and instruct the public e.g. in health campaigns (hygiene, risk avoidance, reduction of contagion risk). Around 100,000 people avail themselves of FRC first aid courses every year. In a pandemic situation, FRC is able to quickly open a national helpline, tel. 0203 66 266, and man it, if necessary, around the clock. The helpline may be used to offer crisis assistance and health advice. Volunteers have been trained to man the phone. The FRC Psychologists' Preparedness Group and FRC healthcare professionals back up the volunteers. FRC volunteers can also act as support for public social services, such as food transport, caring for lonely people or those living in remote areas, in evacuation situations or in assisting healthcare personnel (e.g. vaccinations).

Under an agreement between FRC and the Ministry of Labour, EED Centres and FRC Districts agree the extent of the Red Cross contribution in preparedness for receiving asylum seekers in a normal situation or in mass entry situations. Some of the FRC Districts have made more detailed plans on setting up reception centres. The centres may be suitable as

quarantine facilities in an epidemic. If required, the organisation may, as support to local authorities, recruit personnel both for setting up the centres and the quarantine stage. Arrangements regarding materials and protective equipment for the centres will be made separately with the authorities.

The FRC field hospital, which is of general hospital standard, can be used to provide treatment for 160 patients. To staff the field hospital, FRC recruits from its international reserve healthcare professionals, logisticians and technicians who are not tied to their own workplaces.

An assessment of necessary staff numbers has been made at the Finnish Red Cross Headquarters. In order to guarantee the promised services, about 40-50 of Headquarters officials must be available, as well as the same number from the Districts, or approx. 100 staff in all. In addition, the organisation is capable of recruiting even thousands of volunteers.

The Blood Service is a part of the Finnish Red Cross operation. Measures connected with its pandemic preparedness are outlined in section 2.1.4.

12.4.2 Churches

Churches and other religious communities play an important role in sustaining people's capacity to cope with psychological crises.

According to the principles of preparedness planning of the Evangelic-Lutheran Church, the church must under all circumstances secure the care of religious life and religious activities, and provide all parish services, particularly the social service function associated with burying the deceased. The crisis networks should ensure that nobody is left alone. Hospital chaplains work in hospitals in cooperation with healthcare staff. Spiritual and other counselling help is available from the church Helpline, or by contacting a parish worker, priest or deacon. The parishes also have befriending services and grief peer support groups. See also www.evl.fi / for those needing help.

12.4.3 Voluntary organisations

Voluntary organisations are an important resource in managing disasters and other emergency situations. They can provide assistance in various supply and service tasks and transport. The Finnish Red Cross coordinates the Voluntary Rescue Service (Vapepa) incorporating 47 organisations, with members who are trained and equipped to assist the authorities. Vapepa organises e.g. emergency accommodation, clothing, food supplies, advisory services and counselling. The Vapepa network is countrywide, with 1,400 alert groups and about 20,000 volunteers. Specialities of Vapepa member organisations include road services, physical exercise, national defence, rescue, first aid and women's services. (*Appendix 11*)

13 COMMUNICATIONS

Cooperation with WHO and EU is described in sections 8.1.1 and 8.1.2.

13.1 Communications and information

Communications in the period immediately preceding and during a pandemic may be defined as crisis communications. Communications form a part of the crisis management system and are involved in all the processes where information is disseminated, matters agreed and decisions implemented. Crisis communications are only successful if they are well-planned, integrated in management of emergency situations, and follow agreed game rules that are known by the whole organisation.

13.1.1 Principles of internal communications

In a crisis situation, the importance of internal communications is paramount. The management of the organisation decides who is responsible for communications in a crisis situation, and which experts support the communications unit in discharging its functions. Under normal circumstances, each expert communicates on his own area, but in an emergency situation it may be wise to centralise communications to certain persons, to give the crisis a face. At the very least, it must be ensured that the content of information given by different persons on an issue is congruous.

Communication is interactive, and also includes provision of information by experts to their superiors on issues important in terms of crisis management, and that they in turn inform their own superiors, right up to highest political leadership. Heads of departments and units should always keep the entire personnel up-to-date as to the actions taken in managing the situation, and who is responsible for different functions. Everyone working in an organisation must know to whom various queries or supplier contacts should be directed. In crisis situations, there is no longer time to establish operational responsibilities.

Well-functioning communications in crisis situations are founded on well-planned and well-executed normal time communications. In crisis situations, new operational systems are no longer set up, but measures are taken to enhance operations of normal time organisations for the duration of the crisis.

13.1.2 Aims of public communications

In a widespread epidemic affecting the whole population, communications support management of the epidemic, maintenance of vital functions of society, and coping of the population with the epidemic as well as possible, both physically and psychologically.

With a raised influenza pandemic alert (WHO phases 3–5) and during the pandemic (WHO phase 6), the core functions of communications are:

- to slow down spread of infection through instruction on hygiene and protective measures
- to slow down spread of infection into Finland from possible geographically defined pandemic alert areas

- to support admission of those affected into appropriate treatment and to give instructions on home nursing
- to provide the public with detailed instructions on implementation of vaccination programmes covering the whole population
- to maintain the capacity of society to function by providing information and directions in support of sensible actions and by preventing inappropriate reactions
- to prevent the spread of rumours and misinformation
- to sustain the spirits of the population and to monitor their fluctuations

A precondition of coping with a pandemic is that the citizens' trust in the authorities is preserved. One of the most important factors in building confidence is successful communications. In a pandemic situation, information issued by the authorities is of exceptionally high significance. The information released must be:

- truthful
- sufficient
- easily accessible
- understandable and unambiguous
- uniform and non-contradictory
- timely
- available in Finnish, Swedish, English, partially also in Russian
- take into account different target groups, their situations and needs

In terms of communications, preparedness proceeds in accordance with the World Health Organisation (WHO) pandemic alert (phases 3-5) and the pandemic phase (6), so that communications measures are augmented in accordance with an advance plan as the alert progresses.

13.1.3 Parties responsible for communications

The Ministry of Social Affairs and Health, in cooperation with departments and agencies in its sector, particularly the National Public Health Institute, is responsible for planning and directing communications concerning the pandemic alert and pandemic.

Each Ministry is responsible for communications within its own administrative sector with regard to the pandemic. Systematic cooperative procedures between the Ministries' communications units will be agreed and the directions appended to each Ministry's preparedness plans concerning communications during a pandemic.

Responsibility for communications always lies with the responsibility for directing operations. If the responsibility for directing pandemic preparedness and a pandemic situation was transferred from the Ministry of Social Affairs and Health to the Government (section 8), the responsibility for communications would also pass to the Communications Unit of Prime Minister's Office.

In a pandemic situation, the importance of regional and local communications is emphasised. The citizens must have very detailed instructions and information e.g. on places of

treatment. Such information must be provided as locally as possible, preferably by the local authority.

State Provincial Offices, Hospital Districts and health centres ensure that regional and local communications plans regarding a pandemic are included in preparedness plans.

13.1.4 Target groups of communications

1. population
2. social and health service professional personnel
3. media at home and abroad
4. personnel of each administrative sector (internal communications)
5. various interest groups

During the different pandemic alert phases and the full-blown pandemic, communications must, by necessity, be targeted at rather small, specific groups. Such target groups may be e.g. travellers entering or leaving the country.

13.1.5 Channels of communication

1. media
2. Internet
3. Teletext
4. telephone helplines
5. replying to letters and emails from the public
6. printed information, e.g. for every home, school or workplace
7. paid advertising

The media

The media constitute the most important tool in dissemination of information, making cooperation with them extremely important. The media are kept up-to-date at the various phases of the situation by stepping up normal communications directed at them. In addition to press and online releases, daily press conferences at a fixed time will be organised for the media during the pandemic phase. As necessary, the Government will hold communal news conferences, and the Ministries will also hold their own conferences.

If the pandemic situation demands restrictions of gatherings, the news conferences may be transmitted online. Telephone interviews with experts may also be arranged for reporters.

The media will also be directed to watch the WHO website, which will be kept updated with information on the pandemic situation worldwide. WHO has published a guide for reporters on its website, entitled “What every journalist should know about influenza”. The guide will be updated by WHO as necessary.

The communications units of the Ministries ensure that their administrative sectors have plans in place for servicing the media during the pandemic alert and full-blown pandemic. The plans include preparedness for increased human resources in communications units, and ensure that named content experts are designated, as necessary, as communications and media partners.

The Prime Minister's Office Communications Unit will ensure that the communications units of the Ministries have communal facilities at their disposal, with appropriate technology for organising both joint and individual news conferences by the Ministries.

Official and emergency information bulletins

The media will monitor functioning of society intensively during the pandemic alert phase and the full-blown pandemic, and give it very varied exposure. In some situations, broadcasting of official or emergency bulletins may also be necessary.

The Finnish Broadcasting Company is obliged to broadcast official information bulletins both in exceptional situations under normal conditions and in emergency conditions that are less severe than war. Radio Suomi and Radio Vega are the most important FBC channels for regional operations by the authorities. Their networks may be divided for provincial broadcasting. The importance of television is also great, although radio would be the primary tool.

An emergency bulletin may be broadcast when loss of human life or significant damage to property are an imminent threat. FBC broadcasts the emergency bulletin through all its channels. It is broadcast simultaneously also on commercial radio stations and, as far as possible, on television channels. The emergency bulletin interrupts all ongoing programmes.

Other official bulletins may be broadcast when the danger is not quite imminent. The bulletins are read as promptly as possible on Radio Suomi and Radio Vega, as well as on the commercial radio stations selected by the authorities.

The Internet

The importance of the Internet – or online services – is emphasised when the alert phase reaches 4 or 5, as it is an ideal tool for disseminating up-to-date information to a large target group quickly. The prerequisite is that the load capacity of the various actors' online services has been sufficiently raised and that network service systems have backups to secure uninterrupted operation. In the actual pandemic phase, online services are the primary means of communication.

Each authority maintains and updates the information of their own sector on their online service and includes links on their websites to those of other authorities. The Government will compile a summary web page on its own website, with links to all other websites.

All information should not be collated in one online service, as the user numbers on servers are likely to be extremely high during a pandemic, and spreading information across different servers will ensure its availability.

Operators must test the load capacity of the online services and if necessary, draw up plans for improving load capacity.

The National Public Health Institute online service contains information directed at both healthcare professionals and the public. At the time of implementation of the preparedness plan, the need for a dedicated online service for expert use, an extranet with passwords and usernames, will be assessed.

To reduce the loading of both online services and telephone helplines, "Frequently asked questions" pages will be constructed and updated constantly as the situation demands.

To secure maintenance of online services, training will be targeted at increasing website updating skills, as they are currently in the hands of too few.

Teletext

Teletext is a good channel for dissemination of information, especially if the Internet connections fail. The Ministry of Social Affairs and Health Information and Communications Unit is investigating dissemination of information on the influenza pandemic on Teletext with FBC.

Telephone helplines

During a pandemic, the public must be able to rely on the political leadership and authorities directing operations efficiently. Well-executed telephone advisory services build up public confidence in the authorities and their work.

For example, the experiences gained from the tsunami show that in a crisis situation, successful telephone helpline services hold a key position. Although information and advice is available online, in the media and distributed in other ways, a proportion of people will ask for instructions by telephone. Not everyone has an Internet connection at home, and when they or a family member are sick, they cannot seek Internet connections elsewhere. The Internet connections may also be down, in which case information must be obtained elsewhere in an urgent case.

The pandemic will cause disruption in the various sectors of society, and people will need information and advice on what to do in problem situations. As well as the social and health service sector, advice and help may be needed from other sectors, too. This guidance must be available from people's own local authority. The greatest pressure of telephone enquiries is on health centres, and they must pay particular attention in their preparedness plans on the capacity of their telephone advisory services to respond to the needs of the public.

Facilities for citizens' telephone advisory services were completed at Prime Minister's Office in February 2006. The facilities allow for taking 8-10 calls at a time; the intention is to later extend the service, so that calls can be redirected from the helpline directly to the offices of Ministry officials. The facilities can be taken into use whenever enhanced communications and public telephone helplines are required.

The Ministries and the experts in their sectors cannot be detached from their other work in managing the situation to telephone helplines, but external persons must be recruited for the job, or the service outsourced from elsewhere, e.g. from an organisation. The Finnish Red Cross has excellent resources for organising personnel for telephone helplines in matters linked to the pandemic. The telephone personnel undergo crash courses in their duties and have at their disposal ready-made question-answer lists, as well as the option of consulting experts when necessary.

Each Ministry is responsible for its sector preparedness plan taking into account management of public telephone enquiries during the pandemic alert phase and full-blown pandemic.

Letters and emails from the public

During a pandemic, the numbers of letters and especially emails sent by the public to the authorities will multiply. Under the Administrative Procedure Act, citizens' letters and emails must be answered.

Messages from the public must also be attended to during a pandemic, as far as possible. The feedback obtained from telephone calls, letters and emails from the public must be for-

warded in the agreed manner within the organisation, for it to be taken into account, when necessary, in planning and directing operations.

Information material prepared in advance
Information, instructions and recommendations contained on websites is continually updated. Additionally, preparations must be made for enhanced dissemination of information, such as sending instructions to every household or their distribution to schools, workplaces etc. To this end, material is drafted to almost the print-ready stage, and updated in accordance with latest information before dispatching.

Each Ministry with its administrative sector decides the kind of advance material it is likely to need and ensures that the material is drafted.

The National Public Health Institute works together with the Ministry of Social Affairs and Health in preparation of the necessary material on healthcare. Appropriate resources are required for the drafting process.

Paid advertising
Although the media will address the pandemic from different angles, it may be necessary to use also paid advertising in newspapers and on radio and television. Paid advertising may be particularly appropriate when the population must be given detailed instructions on what action to take or how to behave.

13.1.6 Informing healthcare professionals

The National Public Health Institute is responsible for advice and guidance of healthcare professionals. The Institute has a dedicated section for professionals on its website. It may also set up advisory telephone services related to influenza for healthcare professionals. The National Public Health Institute epidemic communications procedures are described in more detail in Appendix 13.

To make sure that information disseminated on the pandemic by different interest groups is uniform and non-contradictory, cooperation between the various actors must be systematic and seamless.

13.1.7 Communications resources

For enhanced communications, additional resources are required at all levels of the operation: employees, equipment and cash.

Personnel
In the Ministries and their administrative sectors and in State Provincial Offices, some extra manpower may be released for communications by prioritisation of functions and transferring employees to communications tasks within the Ministries or sectors.

Wherever it is implemented, public telephone advisory services and replying to letters and emails requires sufficient numbers of staff.

In Hospital Districts and health centres, management of both public communications and the media is a particularly challenging prospect, as not all units by far have communications specialists. This highlights the responsibility of experts for communications.

In planning personnel resources, it should be considered that much of experts' work input is tied up with managing communications both independently, e.g. in expert interviews, and in acting as content experts in communications and media units.

Transferring staff to other duties demands training. The entire personnel of communications units, alongside other personnel, requires training on issues specifically related to the pandemic.

Tools

Enhanced communications demand extra capacity, e.g. on the Internet. In a crisis situation, the authorities must have at their disposal a system that

- is capable of servicing large visitor numbers in exceptional situations
- publishes new material quickly
- provides consistent security of service
- recovers quickly from malfunctions
- provides a channel also for offices and agencies of the administrative sector

The security of service of the Internet concerns direction and management of the whole situation, as well as communications. Today, more and more operationally essential information is transmitted online. The communications systems of the EU, WHO and ECDC (European Centre for Disease Prevention and Control), among others, rely on online services.

In crisis situations, mobile phone networks quickly become overloaded. As far as possible, functioning of telephone connections should also be ensured in advance.

Funds

Sufficient funds must be set aside for communications, in order to purchase e.g. services from advertising agencies, production and distribution of various materials, and paid advertising. Reserve funds must also exist for overtime payments.

13.1.8 Monitoring of communications

During and after the pandemic, implementation of advance plans, how well the operation worked in general and where improvements might be made, will be evaluated. It must be ensured that monitoring of realisation of communications is included in these plans.

13.2 Internal communication

Finland's Public Authority Network (VIRVE) is a system developed for internal communications. It is a digital radio telephone network based on the TETRA Standard, and covers the whole of Finland. The system permits extremely fast connections between different authorities with the aid of pre-planned call groups. New call groups can be formed quickly as required. Individual calls and group messages are also possible. Group calls are a quick and efficient way of issuing instructions and disseminating information, making the Public Authority Network eminently suitable for exchanging information is situations such as a pandemic. The call group structure is designed with both normal and emergency conditions in

mind, and may be used as required nationwide or regionally. Approved users of the VIRVE terminals include the authorities ensuring national and municipal security and organisations that have contracted to cooperate with them.

For collaboration between authorities to be successful, it is crucial that all those entitled to use VIRVE obtain a terminal and use it. Proficiency in using the telephone is best maintained by using it daily.

14 LEGISLATION

14.1 Current legislation on communicable diseases

The powers and obligations stipulated in the Communicable Diseases Act (583/1986) are pivotal in combating an influenza pandemic, and they form an adequate basis for governance. The obligations stipulated concern all administrative levels and public healthcare experts: the Ministry of Social Affairs and Health, State Provincial Office, local municipal authority, National Public Health Institute and Hospital District. The authorities are under obligation to take urgent action, if the population is in danger of being exposed to a spreading contagious disease fulfilling the criteria of a dangerous communicable disease. The decisions of the authorities may be executed immediately, regardless of submission or appeal.

The Act also regulates on direction and experts, the obligations of whom are discussed in more detail in section 8.2.

When prompt action is required in order to prevent the spread of an infectious disease posing a serious threat to public health, the Ministry of Social Affairs and Health and, on provincial level, the State Provincial Office may make the necessary decisions. The decision permits implementation, during a fixed term, of measures that are applied in cases of infectious diseases involving danger to the public.

The local authority is obliged to organise the work of infectious disease prevention in its area, as part of primary public healthcare. Under the Primary Health Care Act, implementation of primary healthcare is organised by an organ set up by the municipality with multiple membership. In the Communicable Diseases Act, this is called the municipal body responsible for the prevention of communicable diseases.

The municipality may organise the duties of social services and healthcare by taking care of the functions itself, by agreement jointly with another local authority or authorities, by being a member of a joint municipal board to which the activities are entrusted, or by obtaining the services from the state, another local authority, a joint municipal board or other public or private service provider.

Therefore, a local authority may agree to organise prevention and control of contagious diseases with a neighbouring municipality or municipalities, in such a case as e.g. having no doctors in its employment. In that case, the municipality will obtain the expertise from the medical practitioner responsible for contagious diseases in the neighbouring local authority. The proposal is issued by a municipal official who does not need to be a doctor.

A situation may arise in a Hospital District that it does not have a physician responsible for contagious diseases, or it is otherwise unable to cope with the situation brought about by an influenza pandemic alert or pandemic. In that case, it may agree with another joint municipal board (Hospital District) or municipality on treatment of patients affected by the infectious disease. If an agreement cannot be reached, the Government may order an agreement to be made.

Each health centre has a medical practitioner responsible for contagious diseases, obliged to establish the type and spread of a suspected or confirmed infectious disease, and to take the necessary action in an effort to prevent the spread of the disease. He is further responsible for communications, health education and advisory services in the health centre catchment area. He is in charge of examinations, tests and treatment of the person affected or suspected of being infected by a communicable disease that is a danger to public health, as well as issuing instructions to prevent transmission.

If these measures are insufficient to prevent the spread of the disease, the municipal body responsible for control of communicable diseases may order an infected person or one with sufficient grounds to suspect him of being infected to absent himself from work, daycare or an educational institution.

A person infected by a contagious disease posing a risk to public health, or one with sufficient grounds to suspect him of being infected, may be isolated in a healthcare facility, if the risk of the disease spreading is apparent, and if there is no other way of preventing the spread of the disease, or if the person cannot or is unwilling to agree to other necessary measures to prevent the spread of the disease.

At the place of isolation, a person suffering from an infectious disease involving danger to the general public may be administered treatment necessary to prevent the spread of the disease, regardless of his wishes.

Moreover, when prompt action is required in order to prevent the spread of an infectious disease posing a serious threat to public health, or an infectious disease fulfilling the criteria of one, the Ministry of Social Affairs and Health and on provincial level the State Provincial Office, or the municipal body responsible for controlling infectious diseases, may order quarantine for a fixed period for a person who has been exposed or may on sufficient grounds be suspected to have been exposed to a dangerous infectious disease, but who is not in need of hospitalisation because of his state of health. The place of quarantine may be e.g. the person's home, a hotel or a refugee reception centre. The aims and content of the actions are described in more detail in section 10.2.

A person may be ordered to be quarantined also regardless of his wishes. The maximum period of enforced quarantine is one month. In reality, the decision to quarantine is made for the necessary period, depending on the incubation period of the disease, for example for a week or a fortnight. The Administrative Court may, on submission by the decision-making authority, continue the quarantine by a maximum period of two months, if the salient reasons still exist, and it must be discontinued immediately such reasons no longer exist. The decision to discontinue the quarantine is made by the health centre physician responsible for infectious diseases.

In an urgent case, the health centre physician responsible for infectious diseases may make the decisions e.g. on enforced quarantine, absence from work, absence from daycare or educational institution and isolation. The decisions must be immediately submitted for enforcement by the municipal body responsible for prevention and control of communicable diseases.

In an influenza pandemic situation, the municipal body responsible for prevention and control of communicable diseases may order the isolation of dwellings and service institutions in its area, as well as closure of educational institutions and daycare centres, ban events causing gatherings or issue orders restricting them. It may also order cleansing and disinfection operations to be carried out.

If the State Provincial Office, the municipal body responsible for control of communicable diseases or the health centre doctor responsible for infectious diseases decides that there is no other effective means of preventing the spread of an infectious disease posing a danger to the general public, the police must provide official assistance on request.

Under the Act on Client Fees in Social Welfare and Health Care (734/1992), examinations, treatment and medications prescribed for treatment of an infectious disease posing a risk to the general public, as well as isolation in a healthcare institution of the infected person or one suspected to be infected, are free healthcare services. Vaccines are free to the local authority.

A person who has been ordered to absent himself from his employment, to isolation or quarantine, in order to prevent the spread of an infectious disease, is entitled to sickness benefit in accordance with the Sickness Insurance Act. The same applies to the guardian of a child, if a child under 16 has been ordered to be kept at home for the above reason, and the guardian is therefore prevented from going to work. In addition to the daily sickness benefit allowance, the person is entitled to reimbursement of lost earnings.

The Government proposal on the amendment to the Communicable Diseases Act, effective from 1 December 2006, suggests that in a situation where passengers on international transport need to be ordered to quarantine, the Government should stand the costs resulting from the arrangement.

Primary responsibility for directing a patient infected by a generally dangerous or notifiable disease, as well as others who may have been infected, to examinations and treatment lies with the doctor treating the patient. If he cannot do this himself, he must pass on the task to the doctor responsible for infectious diseases in the health centre or Hospital District.

Doctors and laboratories are under obligation to issue a communicable disease notification to the Hospital District on cases of notifiable infectious diseases likely to endanger the general public. This duty of notification would also apply to influenza classified as posing a danger to the general public during a pandemic alert phase and full-blown pandemic. The National Public Health Institute maintains a National Register of Infectious Diseases. The notification procedure and registration of infectious diseases are precisely stipulated by law, taking into account data protection.

The Ministry of Social Affairs and Health may decide that in order to prevent or control an infectious disease epidemic posing an imminent threat to public health, and in order to treat the disease and complications caused by it, an exception to the stipulations of the Medicines Act (395/1987) may be made and use of a pharmaceutical product permitted without a sales licence issued by the National Agency for Medicines or the relevant European Union agency.

A hospital pharmacy and dispensary may supply medical products to other social and healthcare units without a licence issued by the National Agency for Medicines under section 62 of the Medicines Act, and the healthcare unit may supply a person attending a surgery with the medication required for his treatment.

The National Public Health Institute must ensure that sufficient quantities of vaccines, antigens and testing materials used in prevention of infectious diseases are available, monitor the effectiveness and impacts of vaccines used in prevention of infectious diseases, take action to investigate a confirmed or suspected complication of vaccination, and ensure that the vaccines are appropriately distributed.

With the growing importance of infectious diseases, preparedness of healthcare must be stepped up to intervene in time in such issues that prevent the spread of infectious diseases, creation of microbe strains that are resistant to antimicrobial drugs, and hospital infections. For instance, State Provincial Offices can make sufficiently high standards of hygiene a licence condition for private service providers. The municipal officer inspecting the premises of such service providers should pay attention to this. More general guidelines are required. The obligation to provide them already exists.

The current Emergency Powers Act (1080/1991) obliges local and national authorities to ensure functions as free of disruption as possible under emergency conditions, by means of preparedness plans and other measures. The concept of major disaster has not covered preparedness for dangerous contagious disease epidemics as clearly as preparedness for mechanical, chemical and radiation accidents. The increased need for preparedness for biological threats has only emerged in recent times.

14.2 Labour legislation

The Occupational Safety and Health Act (738/2002) defines the minimum requirements for working conditions and good occupational safety and health practices in the workplace. It is a general law covering all employment.

Under the Occupational Safety and Health Act, the Government resolution on choice and use of personal protection at work (1407/1993) and the Government resolution on personal protection (1406/1993) have been passed.

The Act on Occupational Safety and Health Enforcement and Cooperation on Safety and Health at Workplaces (44/2006) contains stipulations on the rights of the occupational health and safety inspector and the occupational health and safety representative.

The Occupational Safety and Health Act also covers biological risk factors at work. It stipulates that the exposure of an employee to a biological factor constituting a danger to his safety or health must be limited to such a degree that such a factor does not cause harm or constitute a danger to the employee's health or reproductive health. Under the relevant section of the Occupational Safety and Health Act, the Government decision on protection of employees from danger caused by biological factors at work (1155/1993) and the Ministry of Social Affairs and Health decision on classification of biological factors (229/1998) have been given.

The above regulations define the employer's obligations, such as assessment and identification of risks, measures to minimise risks, personal protection, information and training of employees, notifications to competent authorities, registers of exposed employees, preparedness plans in case of failure of physical barriers, and the issues of employer–employee cooperation in addressing the issues covered by these regulations. The employer's obligations are partially dependent on the risk classification of the biological factor. The current Ministry of Social Affairs and Health decision (229/1998) classifies the influenza A virus in the least serious group II causing disease in humans. The above-mentioned Government decision (1155/1993) also contains regulations on vaccinations at the employer's expense for employees who are exposed or will possibly become exposed.

The preventive measures must be based on workplace risk assessment, which is the employer's responsibility, as are measures to minimise the risks. General protective measures take precedence over individual measures.

The Occupational Health Care Act (1383/2001) and the subsequent Government Decree on medical examinations in work that presents a special risk of illness (1485/2001) contain the regulations on medical check-ups to be carried out by occupational healthcare due to biological factors.

The medical examination requirement is based on the assessment of danger and risk factors carried out in the workplace. When a risk of exposure has been established, the employee must be given both an initial medical examination and a second one after a set period. Under the Government Decree (1485/2001, section 5), the aims of the medical examination are

1. to identify health risks inherent in the working conditions and to produce information for taking preventive action;
2. to investigate the employee's exposure and the likely changes in his capacity and state of health resulting from it;
3. to establish the employee's suitability for work resulting from his state of health or changes in his state of health;

4. to inform the employee of the health risks inherent in his work and to provide instructions on preventing the adverse effects;
5. to direct the employee to medical investigations and treatment when suspecting an occupational illness; and
6. to monitor the impacts of implemented occupational safety and health measures and other changes.

*The Working Hours Act (*605/1996) includes regulations on mandatory notifications to occupational safety and health authorities in exceptional situations.

The Commission for Local Authority Employers has collated regulatory and contract material relevant to occupational health and safety and working in a pandemic situation, to provide guidelines to employers in case of a pandemic. The memorandum may be found on the Commission for Local Authority Employers website: www.kuntatyonantajat.fi, search word 'pandemia'.

14.3 Assessing the need for revision of legislation

When assessing the need for revision, the intention is that in prevention of infectious diseases, as effective action as possible could be taken within the framework of normal legislation. The Ministry of Social Affairs and Health and the State Provincial Offices should be provided, also when normal legislation is in force, with the option of ordering fixed-term changes to the organisation of social and health services in a pandemic situation. These powers would be likely to be needed on rare occasions. Drafting of an amendment to the Communicable Diseases Act is desirable. The Emergency Powers Act obliges the public sector, including healthcare, to make advance preparations in order that execution of its functions in emergency conditions would be as trouble-free as possible. In addition to emergency conditions, it has recently been emphasised that the preparedness should also concern exceptional circumstances. A widespread infectious disease epidemic would be such a circumstance.

14.3.1 Distribution of free drugs

In a pandemic situation, it is epidemiologically justified to ensure that the patient obtains the drugs he needs, stored in national reserve stocks, free of charge from the healthcare units where his diagnosis is established. It is not justifiable that the infected person moves on from the influenza clinic to a pharmacy, and thus likely contributes to the spread of the pandemic.

14.3.2 The medical practitioner responsible for infectious diseases and other employees under various contracts

The Communicable Diseases Act and Decree set out the duties of the medical practitioner responsible for infectious diseases working under a municipal body or agency. This responsibility can only be conferred on a doctor in a permanent post, and consequently a local authority with no appointed doctor should draw up an agreement with a neighbouring authority

with a view to executing the work of infectious disease prevention and control in cooperation, or to outsourcing expert services from the neighbouring municipality or a private service provider.

Healthcare units employ, under various types of contract, persons such as locum or agency doctors, self-employed persons and students. Their contracts should take into account continuity of the employment also in emergency conditions and exceptional circumstances.

14.3.3 Humans infections caused by the A/H5N1 avian influenza virus

The Communicable Diseases Decree will be amended with the addition of a human case of infection by the influenza A/H5N1 virus, known to have caused epidemics of avian influenza, to the list of communicable diseases constituting a danger to the general public. Drafting of this amendment has begun at the Ministry of Social Affairs and Health. Later, if necessary, any other influenza virus subtype causing an influenza pandemic will also need to be classified as a communicable disease constituting a danger to the general public.

14.3.4 Preparedness obligations of private healthcare

The Private Health Care Act includes the option that State Provincial Offices may set conditions essential for securing patient safety, regarding the quantity of services, personnel, premises, equipment and materials, and procedures. Discussions have taken place on statutory obligation of preparedness also for large private healthcare units, such as hospitals.

14.3.5 Regulations on non-urgent treatment

The Primary Health Care Act and the Act on Special Medical Care regulate on access to treatment. For non-urgent cases, a maximum period is stipulated, within which the assessment of the need for treatment must be carried out and the maximum period within which the treatment must be commenced.

In a pandemic situation, it may not be possible to fulfil these set periods, since the number of patients requiring acute treatment is so great that the assessment and commencement of other non-urgent treatment will have to be postponed. To this end, both statutes should include a mention that a great number of patients requiring urgent treatment justifies the local authority and Hospital District in issuing new, temporary directions on access to non-urgent treatment. This would be specific to Hospital District or municipality, as the situation does not necessarily affect the whole country simultaneously.

The new draft Emergency Powers Act acknowledges that unexpected situations may arise in emergency conditions, where the capacity of the healthcare system is not sufficient to execute all the duties of normal conditions. For this reason, a Government Decree would allow for exceptions to the periods set for non-urgent treatment under the Primary Health Care Act and the Act on Special Medical Care.

14.3.6 The Emergency Powers Act

The powers under the Emergency Powers Act only apply under emergency conditions. Under emergency conditions, the Government has a considerable number of rights that it does not have under normal conditions. In order to safeguard public healthcare, orders may be issued to medical treatment and research institutions, health centres, pharmaceutical manufacturers, pharmaceutical wholesalers, pharmacies and producers and service providers of goods required in healthcare. Manpower may be targeted as necessary, and its use directed.

The definition of emergency conditions under the present Emergency Powers Act does not include an influenza pandemic or any other major epidemic. Nor is an influenza pandemic regarded, within the constraints of the current Act, as such a situation comparable to a major disaster that the Emergency Powers Act would be invoked. As the pandemic progresses, economic implications may possibly accelerate its invocation, but this justification has not been deemed to be very likely either.

The emergency powers legislation is currently under review. The intention is for the Emergency Powers Act to comply with the requirements of the 2000 Constitution of Finland and for the powers of the authorities to be reviewed. A significant amendment in the case of an influenza pandemic is likening a widespread infectious disease to a major disaster. A very exceptional state of disruption would also arise if a WHO pandemic alert phase 5 situation was to occur in Finland. In such a case, emergency measures may be required even before the actual pandemic begins.

In order to secure adequate manpower during emergency conditions, the Government may, both under the present Emergency Powers Act and the proposed new Act, order a person resident in Finland who has received training in the sector or is otherwise suitable for healthcare duties to perform such tasks as he is capable of, commensurate with his training or experience. Under the current Act, the order covers people aged 17-64, and under the proposal those aged 18-68.

Private healthcare should be under obligation of preparedness for emergency conditions and exceptional circumstances, such as a dangerous disease epidemic. Under the new proposed Emergency Powers Act, the obligation of preparedness through preparedness plans and advance preparations would continue to apply only to public healthcare. Regulations on preparedness in other private sectors are included in other legislation concerning them. Nevertheless, the Private Health Care Act does not include an obligation of preparedness. The private healthcare sector should also be under obligation of preparedness, since it constitutes an ever growing part of healthcare services.

Under the proposed revised Emergency Powers Act, moving healthcare units around and making operational changes in them in emergency conditions within a province would be under the powers of the State Provincial Office, and the Ministry of Social Affairs and Health would have the option of making decisions on changed location and operation concerning pharmaceutical manufacturers and wholesalers, pharmacies, and self-employed persons who supply goods or services to healthcare or otherwise operate in the healthcare sector. Under the proposal, powers would be delegated by the Government to the Ministry of Social Affairs and Health and to State Provincial Offices.

15 IMPLEMENTATION, PREPAREDNESS EXERCISES, EVALUATION AND UPDATING OF NATIONAL PANDEMIC PREPAREDNESS PLAN

Developing preparedness in accordance with the National Pandemic Plan requires measures in all administrative sectors. The highest official responsible for preparedness in each ministry is the Permanent Secretary. In coordination and integration of the activities of the different administrative sectors, the Meeting of the Heads of Preparedness and Permanent Secretaries plays a central role. If it deems necessary, the Ministry of Social Affairs and Health may appoint a working group to support and supervise the execution of the plan in the social and healthcare sector. The working group must cooperate closely with the Pandemic Working Group of the National Public Health Institute and the Advisory Board on Communicable Diseases and the Advisory Board for Health and Welfare in Emergency Conditions operating within the Ministry of Social Affairs and Health. The Ministry will ensure that it has at its disposal sufficient human resources to supervise the execution in the social and healthcare sector, and to support and monitor drafting of preparedness plans of other administrative sectors.

The Ministry of Social Affairs and Health and the National Public Health Institute monitor development of the global pandemic situation and preparedness at transnational level (by international organisations, global and regional organisations and individual countries). The Ministry of Social Affairs and Health cooperates with the Heads of Preparedness in monitoring progress in national preparedness.

Each ministry is responsible for progress of preparedness in its own administrative sector and for ensuring that more detailed sector-specific preparedness plans are drawn up. Preparedness objectives will be incorporated as appropriate in the budgets and strategies of ministries and performance agreements of administrative sectors, making monitoring of their implementation a part of the departments' annual activities.

Regional preparedness will be supervised and coordinated by the Provincial Offices that will utilise the expertise of Hospital Districts for support in developing preparedness in healthcare services. They will update their own preparedness plans to comply with the national plan, and ensure that the plans of their own regional healthcare services (Hospital Districts and health centres), as well as those of other administrative sectors and local authorities are compatible.

An essential part of ensuring the appropriate function of preparedness plans is their testing in exercises. Two extensive preparedness exercises have been held in 2005, to test preparedness on national level in a pandemic situation. An avian influenza preparedness exercise testing the functioning of the management system was held in March 2006, and an influenza pandemic exercise in April 2006. The lessons learned through them on the problems in preparedness have been utilised in drawing up this plan.

When updating of provincial level plans has been completed, their functioning should be tested through an exercise specifically designed for assessing the operation of Provincial Offices and regional levels of different administrative sectors. Based on lessons learned from this exercise, the national plan will be updated as appropriate, and the revised plan should be tested in a national preparedness exercise.

Each ministry must check that the plan is up-to-date with regard to issues under their own administrative sector at least once a year, and make revisions as required. As a consequence of a changing pandemic alert or international preparedness situation, updating and revision

may be necessary more frequently than in the annual evaluation process. Each ministry approves changes that only concern its specific administrative sector. Any required revisions with a significant effect on the national plan and operation of other administrative sectors are submitted to the Government Meeting of the Heads of Preparedness. Once the Ministries and the Meeting of the Heads of Preparedness have approved the revisions, they are recorded in the official version of the National Pandemic Plan, published on the Internet. Thus, the plan may be updated as necessary. The assessment and approval procedure of the Meeting of Heads of Preparedness ensures compatibility of the activities by different ministries.

16 FURTHER PREPAREDNESS ACTIONS

16.1 Preparedness plans

The Prime Minister's Office ensures the collaboration of all administrative sectors in preparing for and prevention of an influenza pandemic.

All the ministries ensure that municipal, regional and national preparedness plans are updated to cover preparations for an influenza pandemic, and that economic, legal and other prerequisites for the preparations are in place.

All ministries will take care of preparedness planning of their own administrative sectors, taking into consideration the information included in this Preparedness Plan and its subsequent revisions, on measures that may be taken to slow down the spread of influenza at the different phases of the pandemic, and to limit the damage it causes.

Continuity of the vital functions of society requires advance planning of sector-specific prioritisation and alternative mechanisms. The preparedness planning must take into account that 25-35% of the labour force may be absent from work, due to their own illness, for 1-2 weeks over a period of about 2-3 months. In addition, absences from work may arise due to caring for a sick child or other family member, or possibly due to caring for a child sent home from daycare or school. Concentration of absences over the 2-3 busiest weeks of the epidemic peak in each locality is possible.

The preparedness plans include implementation of hand and coughing hygiene, and as far as practicable, increasing social distance in workplaces, institutions and public premises. The potential for temporary distance working should be assessed in relevant sectors (section 7.1, appendix 3).

The Ministry of Social Affairs and Health Preparedness Unit is taking steps to set up situational management resources in its Control Centre. The necessary agreements on intra-sector transfer of personnel will be drawn up. The Ministry of Social Affairs and Health will set up a Pandemic Coordination Group, once the level of disruption caused by the pandemic alert or pandemic, as declared by WHO, warrants this measure.

State Provincial Offices will direct, coordinate and oversee regional preparedness and protection measures in their areas. State Provincial Offices will ensure that Occupational Health Services are included as an active participant in regional and local pandemic plans. State Provincial Offices must set up registers of private healthcare service providers and professionals and ensure functional contact channels to private healthcare.

Hospital Districts, jointly with State Provincial Offices and municipalities, will draw up regional healthcare preparedness plans. State Provincial Offices, Hospital Districts and municipalities will ensure that sufficient resources are in place for the measures laid down in the plans.

Municipalities and health centres must draw up their own preparedness plans, taking into account collaboration with private health services and voluntary organisations in local planning. When inviting tenders and signing contracts on outsourced services, municipalities must make sure that they guarantee security of service also in situations of biological threat and other catastrophes.

The plans are tested through preparedness exercises, targeted primarily at the sections of the pandemic preparedness plan that are problem areas in inter-sector cooperation, or other identified targets for improvement.

16.2 Legislation

The Ministry of Justice has drafted the revised Emergency Powers Act. It defines as emergency conditions a very widely spread infectious disease equivalent to a particularly serious disaster. The Ministry of Social Affairs and Health has drafted a Government Proposal on removing the clauses on Government guarantees from the Emergency Powers Act, so that vital transportations for Finland could be secured also in circumstances less severe than those defined in the Emergency Powers Act.

The Ministry of Social Affairs and Health has prepared amendments to the Act and Decree on Communicable Diseases on authorising quarantine and decreeing human cases of influenza A/H5N1 during pandemic alert phases 3-5 as an infectious disease endangering the public. The amendments concerning quarantine have already been passed by parliament.

The Ministry of Social Affairs and Health is preparing amendments to the Primary Health Care Act and the Act on Specialised Medical Care (regulations on the provision of non-urgent treatment) in such a way as to create the conditions for successful control of a pandemic.

16.3 Costs

The Ministry of Social Affairs and Health will determine how the considerable additional costs incurred by a pandemic would be divided between the state and local authorities.

The Ministry of Social Affairs and Health will also clarify allocation of quarantine costs. In a quarantine situation, costs will be incurred by loss of earnings, treatment costs, employment of additional staff, cost of drugs and vaccines, equipment and protective materials, premises, training, social insurance and increased need for other social security.

16.4 Epidemiological surveillance and guidelines

The National Public Health Institute and STAKES will improve epidemiological influenza surveillance through improvements to data collection on cause-specific use of health services, developing the National Infectious Disease Register, and by constructing a sentinel surveillance system to permit transmission of up-to-date and reliable information through online technology for use by local, regional and national healthcare authorities.

The National Public Health Institute will maintain online guidelines on influenza surveillance, ascertainment of cases, and control measures relevant for healthcare personnel, as well as relevant guidelines for the public.

16.5 Infection control

The National Public Health Institute will assess the information management procedures required for use of quarantine and surveillance of those exposed to the virus.

The Ministry of Social Affairs and Health, in collaboration with the National Agency for Medicines, the National Emergency Supply Agency and the National Public Health Institute, is preparing a decision-making procedure, through which regulated use of antiviral in-

fluenza drugs may be adopted at the pandemic stage, when the drugs are only available from the central emergency reserves.

Hospital Districts and health centres will draw up regional and local pandemic plans in such a way that transmission of infections is avoided during the treatment chain, including the reception, transport and placement of patients at all stages of the pandemic.

The Department for Occupational Safety and Health of the Ministry of Social Affairs and Health and the Finnish Institute of Occupational Health, in collaboration with the National Public Health Institute and other relevant parties, will prepare the operational principles and guidelines in case of a pandemic for labour protection and occupational health services in such a way that they are compatible with those in other health services.

16.6 Strengthening expertise and know-how

In the supplementary budget for the latter part of 2006, the Hospital Districts were allocated a total of 2.5 million euros, to be used on strengthening the preparedness of Hospital Districts and regional know-how in infectious disease epidemiology. The Government proposal for the 2007 budget contains a 2 million euro allocation for the Hospital Districts, to be used for the same purpose.

Hospital District, health centre and other health service employers must provide information and training on occupational health and safety for their staff in accordance with the relevant regulations, and ensure that sufficient quantities of protective equipment are available in healthcare units.

The Ministry of Social Affairs and Health will improve the preparedness of healthcare personnel to meet the pandemic situation by supporting ethical debate and preparing guidelines for management of infectious patients.

The Ministry of Education and Ministry of Social Affairs and Health will jointly prepare a plan of training employees involved in outpatient and inpatient care of influenza patients, when recruited from other duties, and incorporating material on infectious disease threats such as a pandemic in basic training curricula.

The National Public Health Institute and Hospital Districts will organise training to improve trace-back investigation necessitated by influenza and numerous other infectious diseases, and to define the objectives, implementation and prerequisites in primary healthcare of quarantine, which has been little used in the last decades. The State Provincial Offices will participate in organisation of training for regional preparedness planning, cooperating with Hospital Districts and the National Public Health Institute. The National Public Health Institute will support regional training by producing teaching materials. They will cover trace-back investigation of infections and quarantine.

The Finnish Institute for Occupational Health will assess the types of protective equipment required by various occupational groups, as well as informing and training occupational safety and health and labour protection personnel.

16.7 Material preparedness

The Ministry of Social Affairs and Health will continue negotiations on setting up joint Nordic vaccine production. The Government budget framework for 2008–2010 includes an annual allocation for ensuring a place in the queue for a specific vaccine.

The Ministry of Social Affairs and Health is drafting a resolution on use of prototype vaccines. The National Public Health Institute will prepare for vaccination campaigns to be implemented using prototype and specific vaccines (procurement and distribution of vaccines, training of and provision of guidelines to healthcare personnel, and provision of information for the general public).

The Ministry of Social Affairs and Health, the National Public Health Institute, the Finnish Institute for Occupational Health, the National Agency for Medicines and National Emergency Supply Agency will assess the additional requirements is terms of reserve stocks.

The National Agency for Medicines jointly with the Ministry of Social Affairs and Health will develop the procedures for securing appropriate obligatory stocks of vaccines, antiviral drugs, medications required for treatment of complications from influenza, and supplies for prevention and control of infection, as well as for their controlled release in a pandemic situation. For treatment and prevention of pandemic influenza, the National Emergency Supplies already contain antiviral drugs and vaccines, as well as a limited quantity of inoculation equipment. With the exception of these materials, Hospital Districts and health centres should assess their drug, materials and protective equipment needs and implement the necessary purchases.

Having consulted the experts (FIOH, NPHI, infectious diseases specialists of University Hospital Districts), the Ministry of Social Affairs and Health has estimated the quantities of respirator masks and eye protectors required for pandemic alert phases 4 and 5 and for treatment of intensive care patients during phase 6. The Ministry will issue a recommendation, based on the above, to Hospital Districts. As a further measure, the Ministry of Social Affairs and Health or the Finnish Institute for Occupational Health, jointly with experts, will assess the protective equipment required for inpatient and outpatient care. National guidelines on procuring them can only be prepared once the assessment is completed.

MSAH recommends that the Hospital Districts acquire at least a stock of 500 treatment courses of oseltamivir for possible use in pandemic alert phases 3-5.

The Hospital Districts may negotiate with the National Emergency Supplies Agency regarding the incorporation of regional centralised procurement of materials and protective equipment within the contract framework of National Emergency Supplies. In such an instance, the Hospital District will be responsible for circulating the stocks and replacing used of possibly outdated materials.

Each healthcare unit must relate the number of patients requiring intensive care and respirator treatment to available resources and draw up a plan of their optimal use in a pandemic situation, as well as making the necessary additional purchases.

16.8 Communications

The Ministries will ensure that they have the preparedness for communications concerning their own administrative sector with regard to the pandemic. Information, guidelines and recommendations on the websites will be continually updated.

Each operative party should test the load capacity of the online services and if necessary, draw up plans for improving load capacity.

The preparedness plans should include provisions for telephone helplines. The administrative sectors must prepare for enhanced communications and prepare material in advance for this purpose.

The Preparedness Units of the Ministries will ensure that use of the VIRVE telephone system, developed for communication between authorities, and training for its use, is expanded and made more efficient.

16.9 Other additional measures

The Insurance Department of the Ministry of Social Affairs and Health will assess the liabilities for compensation in a situation where the authorities have accepted certain risks in releasing products (e.g. drugs and vaccines) for use.

The Ministry of Social Affairs and Health, in cooperation with the Ministry of Labour, will continue to reserve quarantine facilities and draft an agreement for use when reception centres are reserved for use as quarantine facilities.

The Department for Occupational Safety and Health of the Ministry of Social Affairs and Health, jointly with the parties in the labour market, will prepare the organisational issues concerning the work of their administrative sector in the various pandemic phases, plans for services obtained from the authorities, and related issues of collaboration in the area of communications. The business sector will also ensure its own preparedness through its own forums.

MSAH (under the direction of the Department for Family and Social Affairs) will initiate the pandemic planning of the social services and update the guidelines for psychosocial support.

The National Authority for Medicolegal Affairs will draw up guidelines for healthcare units on determination of cause of death in a pandemic situation.

The Association of Finnish Local and Regional Authorities will issue guidelines to municipalities on invitations to tender and contracts with the private sector or other parties, to guarantee continuity of supplies or services also in emergency conditions, such as a pandemic.

16.10 International actions

Finland supports the EU systems for communicable disease control, particularly strengthening the role of the ECDC. Finland participates in exchange of information and the search for common policies with other EU countries, as well as taking part in joint EU preparedness exercises.

Finland plays her part in providing aid to South-East Asian and African countries and in other international measures to improve pandemic control coordinated by the UN.

APPENDIX 1

Regional and local preparedness plans or an influenza pandemic – HOSPITALS

In preparing for an influenza pandemic, local preparedness plans of Hospital Districts and hospitals must consider both the large patient numbers and prevention of infection. Suspected influenza patients should be kept isolated from other patients up to the time of discharge, in order to avoid additional infections. If possible, staff caring for influenza patients should not care for other patients. This affects placement of patients and staff working arrangements.

The checklist below is intended to assist in drafting of regional and local preparedness plans.

The pandemic plan should be appended to existing other preparedness plans drawn up for other emergency situations and to the plans on increasing preparedness included in them, and should be consulted when drafting the pandemic plan.

Regional and inter-organisational cooperation is beneficial in drafting the plans.

Collaboration between healthcare and social services is necessary.

The plans will need to be reviewed and updated in a pandemic situation and as the pandemic progresses.

The following issues must be covered by local preparedness plans:

- **Coordination of operations**
  - There must be a named pandemic manager who is in charge of coordinating infection prevention and control during a pandemic
  - The hospital Board and the body responsible for customary preparedness for major disasters must acknowledge the importance of infection prevention and control in a pandemic situation
  - A steering group is set up for a pandemic situation, if one is not already in place. Normal management systems should be followed as far as possible. The steering group should have appropriate representation from the following sectors:
    - Hospital District/hospital board
    - infection prevention team (infection doctor, hygiene nurse, clinical microbiology specialist)
    - occupational safety and health, occupational health representative
    - medical superintendents and chief nurses of all specialities
    - x-ray, laboratory, pathology departments
    - transport services, primary care outside hospital
    - property management, equipment maintenance, waste management, laundry, catering services
    - central stores
    - pharmacy
    - echnology unit
    - telephone exchanges, typing, IT
    - recruitment

        - communications specialist/person responsible for PR
        - head of finance
        - possible other spheres of responsibility
        - State Provincial Office

- **Infection prevention**
    - plan to train all personnel involved with patients in infection prevention
    - training of departmental hygiene contact persons to implement training of other staff

- R**eorganisation of operations and facilities**
    - preparedness for a prolonged emergency situation, with greatest pressure likely to last 6-8 weeks
    - plan of suspension of non-urgent operation and reorganisation of activities
        - e.g. elective surgery, day surgery, rehabilitation
    - plan of suspected influenza patient reception and assessment facilities, positioned separately from premises used by other patients
    - plan of placing large numbers of patients in facilities that must be separate from areas used by other patients (cohorting)
        - preferably separate building/wing/section
        - preferably own reception area
        - preferably own entrance
        - no shared ventilation with other areas; minimum requirement: doors locked between cohort and non-cohort areas
        - no excess furnishings, all surfaces must be easy-clean
        - minimum distance between patient beds one metre
        - no shared social areas
        - reservation of isolation rooms for patients requiring aerosol-forming procedures, if possible
    - plan of placing patients requiring intensive care and respirator care
        - e.g. operating theatres and recovery wards freed from elective activity
    - plan of cohorting patients who have another infection (e.g. MRSA) requiring isolation, in addition to influenza
    - plan of transporting influenza patients to cohort facilities
    - plan of clear signposts to cohort facilities
    - plan of where suspected influenza patients are x-rayed
    - plan of reserve hospital premises
    - plan of bed surveillance during the pandemic

- **Admission of patients into hospital – plans in cooperation with primary healthcare**
    - plan of where, on what criteria and who triages the patients and promptly

decides the correct place of treatment: home, outpatient care, home hospital, primary healthcare hospital, special hospital
    - preparedness for criteria of hospitalisation probably being tighter than in normal situations
    - plan of organised monitoring of patients nursed at home

- **Discharging of patients from hospital – plans in cooperation with primary healthcare**
    - preparedness for avoidance of moving patients within the hospital or from one hospital to another
    - plan for placing patients who require long-term continued care for conditions other than influenza
    - plan of discharging patients from hospital
    - plan of transport for patients discharged from hospital

- **Organisation of staff shifts in such a way that**
    - spread of infection is avoided: cohorting of staff
    - sufficient capable staff is guaranteed in each unit
    - everyone is allowed sufficient rest periods

- **Recruitment – plans on**
    - recruitment of additional manpower
    - taking into account that staff may be forced to undertake duties of which they have no prior experience
    - taking into account that each unit should have staff who are able to instruct others in precautionary measures
    - surveillance and coordination of staff movements so as to prevent the spread of infection: cohorting of staff

- **Occupational safety and health – plans on**
    - where and how employees with respiratory symptoms are assessed
    - administration of antiviral drugs in accordance with instructions
    - organisation of staff vaccinations
    - absence surveillance, including temporary employees
    - psychological and social support of staff
    -
- **Central stores – reserves of materials and equipment**
    - plan to ensure that there are sufficient supplies during the pandemic of e.g.
        - staff uniforms and protective clothing, gloves, mouth, nose and eye protectors and respirator masks
        - disinfectants used for disinfection of hands
        - disinfectants used for disinfection of skin
        - disinfectants used for instruments

        - disinfectants used in cleaning
        - needles, syringes, infusion equipment and fluids
    - an inventory of current stocks is carried out
    - an assessment is made of whether ordering more materials and equipment is feasible and whether there is room to store it
    - an assessment made of the extent stocks need to be supplemented and the schedule

- **Drug supplies**
    - plan to ensure sufficient supplies during the pandemic of e.g.
        - antibacterial drugs for treatment of complications, especially pneumonia
        - basic drugs
    - an inventory of current stocks is carried out
    - an assessment made of whether ordering more drugs is feasible and whether there is room to store it
    - an assessment made of the extent stocks need to be supplemented and the schedule

- **Mortuary facilities**
    - exceptionally high mortality should be taken into consideration by ensuring that adequate appropriate mortuary facilities are available

- **Training of staff in infection prevention**
    - familiarisation of senior doctors and nurses in principles of infection prevention
    - familiarisation of support service unit management in principles of infection prevention
    - practical exercises in use of FFP2 and FFP3 class respirator masks for staff who would be likely to need them
    - practical exercises for all staff involved in patient care in infection prevention: particularly hand hygiene, protection from droplets, use of personal protective equipment

- **Communications/media**
    - Plan of using communications in training on infection prevention
        - plan of posters and guidebooks designed for staff, patients and families
        - plan of using an intranet in training and dissemination of information during a pandemic, in order to avoid personal contacts
    - Plan of other communications within the hospital and communications directed outside
    - Training in use of Finland's Public Authority Network (VIRVE)

APPENDIX 2

Local preparedness plans for an influenza pandemic – PRIMARY HEALTHCARE

In preparing for an influenza pandemic, local primary healthcare preparedness plans must consider both the large patient numbers and prevention of infection. Suspected influenza patients should be kept isolated from other patients, in order to avoid additional infections. If possible, staff caring for influenza patients should not care for other patients. This affects placement of patients and staff working arrangements.

The checklist below is intended to assist in drafting of local preparedness plans.

Health centres must draw up their plans to correspond with the regional pandemic preparedness plan coordinated by the Hospital District and State Provincial Office.

The pandemic plan should be appended to existing other preparedness plans drawn up for emergency situations and to the plans on increasing preparedness included in them, and should be consulted when drafting the pandemic plan.

Regional and inter-organisational cooperation is beneficial in drafting the plans.

Collaboration between healthcare and social services is necessary.

The plans will need to be reviewed and updated in a pandemic situation and as the pandemic progresses.

The following issues must be covered by local preparedness plans:

- **Coordination of operations**
  - There must be a named pandemic manager who is in charge of coordinating infection prevention and control during a pandemic
  - The unit management must acknowledge the importance of infection prevention and control in a pandemic situation
  - A steering group is set up for a pandemic situation, if one is not already in place. Normal management systems should be followed as far as possible. The steering group should have appropriate representation from the following sectors:
    - unit management
    - medical practitioner and nurse responsible for infectious diseases
    - occupational safety and health, occupational health representative
    - all medical superintendents and chief nurses
    - x-ray, laboratory
    - transport services, paramedics
    - property management, equipment maintenance, waste management, laundry, catering services
    - central stores
    - pharmacy
    - technical unit
    - telephone exchanges, typing, IT
    - recruitment
    - communications specialist/person responsible for PR
    - head of finance

- possible other spheres of responsibility
- social services
- local authority/joint municipal board management

- P**revention of infection**
  - plan to train all personnel involved with patients in infection prevention
  - training of hygiene contact persons to implement training of other staff

- **Reorganisation of operations and facilities**
  - preparedness for a prolonged emergency situation, with greatest pressure likely to last 6-8 weeks
  - plan of suspension of non-urgent operation and reorganisation of activities
  - plan of suspected influenza patient reception and assessment facilities, positioned separately from premises used by other patients
  - plan of setting up influenza clinics
    - number and location of influenza clinics must be pre-planned
    - clinics must be easily accessible
    - plan must be functional in local circumstances
    - at influenza clinics: 1. triage of patients to be directed to doctor's surgery or hospital emergency room, and 2. decision as appropriate on prescription of an antiviral drug, and issue to the patient.
    - the influenza clinic should be on-call in nature, preferably 24 hours a day, where the assessment is made quickly and the patient's waiting time is as short as possible.
    - before starting the operation, sufficient quantities of protective equipment must be available for staff and they must be trained in their use
    - the public must be informed of local arrangements; dissemination may be through the media, post, local telephone helpline and online services (Internet)
  - home nursing
    - need for home visits will increase, as some of the patients are unable to seek treatment due to poor state of health
    - monitoring of home-nursed, reasonably well patients must be organised, preferably by telephone
  - home hospital
    - need for home hospital services will increase
  - social services
    - caring for basic needs of patients nursed at home will considerably increase burdening on social services
  - ambulance services
    - need for ambulance services will increase
  - primary healthcare hospitals:
    - plan of placing large numbers of patients in facilities that must be separate from areas used by other patients (cohorting)

        - preferably separate building/wing/section
        - preferably own reception area
        - preferably own entrance
        - no shared ventilation with other areas; minimum requirement: doors locked between cohort and non-cohort areas
        - no excess furnishings, all surfaces must be easy-clean
        - minimum distance between patient beds one metre
        - no shared social areas
        - reservation of isolation rooms for patients requiring aerosol-forming procedures, if possible
    - plan of cohorting patients who have another infection (e.g. MRSA) requiring isolation, in addition to influenza
    - plan of transporting influenza patients to cohort facilities
    - plan of clear signposts to cohort facilities
    - plan of where suspected influenza patients are x-rayed
    - plan of reserve hospital premises
    - plan of bed surveillance during the pandemic

- **Referring patients to hospital – plans in cooperation with outpatient care and hospitals**
    - plan of where, on what criteria and by whom patients are triaged and the correct place of treatment promptly decided: home, outpatient care, home hospital, primary healthcare hospital, special hospital
    - preparedness for criteria of hospitalisation probably being tighter than in normal situations
    - plan of organised monitoring of patients nursed at home

- **Discharging patients from hospital – plans in cooperation with outpatient care and hospitals**
    - preparedness for avoidance of moving patients within the hospital or from one hospital to another
    - plan for placing patients who require long-term continued care for conditions other than influenza
        - setting up of convalescent wards: residential homes for the elderly, premises other than for hospital use
    - plan of discharging patients from hospital
    - plan of transport for patients discharged from hospital

- **Organisation of staff shifts in such a way that**
    - spread of infection is avoided: cohorting of staff
    - sufficient capable staff is guaranteed in each unit
    - everyone is allowed sufficient rest periods

- **Recruitment – plans on**
  - recruitment of additional manpower
  - taking into account that staff may be forced to undertake duties of which they have no prior experience
  - taking into account that each unit should have staff who are able to instruct others in precautionary measures
  - surveillance and coordination of staff movements so as to prevent the spread of infection: cohorting of staff

- **Occupational safety and health – plans on**
  - where and how employees with respiratory symptoms are assessed
  - administration of antiviral drugs in accordance with instructions
  - organisation of staff vaccinations
  - absence surveillance, including temporary employees
  - psychological and social support of staff

- **Central stores – reserves of materials and equipment**
  - plan to ensure that there are sufficient supplies during the pandemic of e.g.
    - staff uniforms and protective clothing, gloves, mouth, nose and eye protectors and respirator masks
    - disinfectants used for disinfection of hands
    - disinfectants used for disinfection of skin
    - disinfectants used for instruments
    - disinfectants used in cleaning
    - needles, syringes, infusion equipment and fluids
  - an inventory of current stocks is carried out
  - an assessment is made of whether ordering more materials and equipment is feasible and whether there is room to store it
  - an assessment is made of the extent stocks need to be supplemented and the schedule

- **Drug supplies**
  - plan to ensure that there are sufficient supplies during the pandemic of e.g.
    - antibacterial drugs for treatment of complications, especially pneumonia
    - basic drugs
  - an inventory of current stocks is carried out
  - an assessment is made of whether ordering more drugs is feasible and whether there is room to store them
  - an assessment is made of the extent stocks need to be supplemented and the schedule
  - planning of antiviral drug distribution and securing necessary premises

- **Plan on organising vaccinations**

- **Mortuary facilities**
    - exceptionally high mortality should be taken into consideration by ensuring that adequate appropriate mortuary facilities are available

- **Training of staff in infection prevention**
    - familiarisation of senior doctors and nurses in principles of infection prevention
    - familiarisation of support service unit management in principles of infection prevention
    - practical exercises in use of FFP2 and FFP3 class respirator masks for staff who would be likely to need them
    - practical exercises for all staff involved in patient care on infection prevention: particularly hand hygiene, protection from droplets, use of personal protective equipment

- **Communications/media**
    - Plan of using communications in training on infection prevention
        - plan of posters and guidebooks designed for staff, patients and families
        - plan of using an intranet in training and dissemination of information during a pandemic, in order to avoid personal contacts
    - Plan of other communications within the unit and communications directed outside
    - Training in use of Finland's Public Authority Network (VIRVE)
    - Instructing call centre staff

APPENDIX 3

Recommended preventive measures not based on using vaccines or drugs

Key to symbols:

Y = yes, should be implemented at this stage

N = no, not necessary at this stage

C = should consider

NR = not relevant

National measures during WHO pandemic development phases (3-6)

Measures	Pandemic alert		Pandemic	Comments
	Phase 3	Phases 4 and 5	Phase 6	
Provision of information and education to citizens				
Information on infection risks and avoiding them for general public (modified according to target group)	Y	Y	Y	
Information for various professionals	Y	Y	Y	
Guidelines on general hygiene	Y	Y	Y	
Information preparing for next phase	Y	Y	Y	
Measures to reduce the risk of those affected spreading the infection				
Restriction of movements:				Plan required for situation with large numbers of severe cases
Restrictions on movement of those infected (mildly and severely) according to situation; medical treatment and social support must be secured	Y	Y	Y	
Mouth-nose mask:				
Persons with symptoms in areas with other people present	Y	Y	Y	Must plan logistics
Exposed persons: risk assessment to include evidence of human-to-human infection, proximity of exposure, repeated exposure	C	C	C	Recommendations based on risk assessment
Respiratory tract infection patients seeking treatment in reception area	Y	Y	Y	Insufficient information particularly in case of healthy persons
Measures to reduce the risk of those exposed spreading the infection				
Tracing and surveillance of the exposed	Y	Y	N	Not possible once pandemic under way
Voluntary quarantine of those exposed (at home) and monitoring of state of health; medical treatment and social support must be secured	N	Y	N	Voluntary quarantine also covers exposed persons who are taking prophylactic medication (uncertainty over its efficacy)
Monitoring of own state of health and notification of sickness, no restrictions on movements	Y	C	N	Does not concern exposed persons under quarantine
Instruction of those exposed in order to reduce social interaction	N	NR	N	Does not concern exposed persons under quarantine See also measures increasing social distance

Measures	Pandemic alert		Pandemic	Comments
	Phase 3	Phases 4 and 5	Phase 6	
Advice to those exposed to postpone travel to areas with no pandemic alert situation	N	NR	Y	Does not concern exposed persons under quarantine. Principle of caution observed, when unclear whether human-to-human infections occurring. See also measures targeted at travel
Prophylactic antiviral medication for those exposed	Y	Y	N	Early aggressive measures to prevent development of pandemic
Measures to reduce social interaction				
Voluntary staying at home of person with symptoms of respiratory tract infection	Y	Y	Y	Need measures to reduce infection risk to other members of household
Closure of schools and educational institutions in conjunction with other measures (e.g. restrictions of leisure activities), reducing interaction of children and teenagers	N	C	C	Significance of these communities regarding infections depends on epidemiological situation
Measures directed at whole population to reduce interaction of adults (sending home non-essential staff, distance working, closure of workplaces, restriction or banning of mass events)	N	C	C	Depends on significance of exposures at work or other community on infections
Mouth-nose masks in public spaces	N	N	N	No evidence of effectiveness; permitted but not recommended
Measures to reduce the delay between onset of symptoms and isolation				
Information to help early recognition of own illness	Y	Y	Y	
Self-implemented temperature taking at least once a day for whole population of alert area	N	N	N	
Telephone helpline for patients with fever and home visit if necessary	N	C	N	
Separate fever clinics with appropriate protection from infection	N	C	N	
Temperature-taking in public spaces using remote thermometers	N	N	N	Not efficient; would require treatment and preventive measures targeted at identified persons with fever
Hygiene and disinfection measures				
Hand washing	Y	Y	Y	
Cleaning of contaminated surfaces in households	Y	Y	Y	
Extensive disinfection of environment	N	N	N	
Disinfection of air	N	N	N	
Measures directed at persons entering and leaving a pandemic area within the country				
Advice to avoid risk environments, e.g. infected poultry farms and poultry markets	Y	Y	Y	
Recommendations to postpone non-essential travel to infected areas	N	Y	Y	If significant areas within country free of infection
Restriction of travel between infected and non-infected areas within the country	N	N	N	Travel restrictions regarded as inappropriate in most countries. Probably implemented voluntarily, when public realises risk attached to travel

Measures	Pandemic alert		Pandemic	Comments
	Phase 3	Phases 4 and 5	Phase 6	
Complete isolation of area	N	N	N	Regarded as inappropriate
Disinfection of clothing, shoes and other items of persons leaving infected areas	N	N	N	Not recommended to safeguard public health, but veterinary authorities may demand to prevent animal infections

International measures

Measures	Pandemic alert		Pandemic	Comments
	Phase 3	Phases 4 and 5	Phase 6	
Measures at borders targeted at person entering or leaving the country				
Provision of information to travellers:				Message must be appropriate to current phase. Although decision to travel is personal, must provide sufficient information to make decision. Traveller may incur consequences concerning health and finance.
Information bulletin on epidemic	Y	Y	Y	
Recommendation that those travelling to an area with avian influenza epidemic caused by highly pathogenic virus avoid poultry farms and animal markets	Y	Y	C	
Recommendation to postpone non-essential international travel to infected area	N	Y	Y	
Recommendation to postpone non-essential international travel from infected areas	See Screening measures			
Measures at borders targeted at international travellers (person entering or leaving infected areas)				
Information bulletins on health risk for travellers to or from infected areas	N	Y	Y	WHO to negotiate with relevant organisations (e.g. IATA) to ensure distribution of leaflets; WHO supports use of standard format information leaflets in different countries
Surveillance of travellers:				
Daily self-taking of temperature for those coming from infected area	N	Y	Y	
Daily self-taking of temperature for those arriving in infected area	N	N	Y	
Contact healthcare, if defined symptoms appear after staying in infected area	Y	Y	Y	Person exposed to definite cases advised to monitor their health. Quarantining may be justified. Persons who have been on same public transport with infected person must be traced and informed of the situation.
Advice on procedures if traveller becomes sick after trip to infected area (seeking medical treatment, disclosing destination of trip, laboratory testing for influenza); if pandemic virus identified, patient must be isolated and health authorities notified, including WHO.	Y	Y	Y	
Screening on arrival of travellers arriving from infected area				Since no health benefit proven, practice permitted (political reasons or to build up trust of public), but not encouraged. Instead, travellers should be provided with appropriate information on epidemic.

Measures	Pandemic alert		Pandemic	Comments
	Phase 3	Phases 4 and 5	Phase 6	
Screening of symptoms (visual observation)	N	N	N	Screening on arrival may be considered if the country deems screening on departure (see below) to have been inadequate at departure point of public transport
Screening for risk group by passenger health declaration or questionnaire	N	N	N	
Screening through temperature-taking	N	N	N	
Medical examination	N	N	N	
Screening on arrival using above methods in geographically isolated areas (islands)	N	Y	N	Implementable, may prevent entry in the country with pandemic virus. May also be considered when country's internal surveillance system has limited capacity
Screening on departure of all travellers from areas with confirmed human infections				More implementable than screening on arrival for early detection of cases
Screening of symptoms (visual observation)	N	N	N	Not feasible due to large passenger numbers
Screening for risk group by passenger health declaration or questionnaire	N	Y	Y	
Remote temperature-taking or taking temperature from the ear	N	Y	Y	Remote temperature-taking is less sensitive and less accurate method, but more implementable than taking temperature from the ear
Travel ban register of isolated or quarantined persons	N	N	N	May be implementable in some countries, but not recommended
Recommendation for sick persons to postpone travel	Y	Y	Y	
Medical examination of travellers belonging to risk groups or with high temperature	N	N	N	Cannot implement on borders
Measures in countries with infected nearby areas in neighbouring country, and no adequate means of controlling border crossings				
Promotion of surveillance and preventive measures, e.g. increasing social distance, quarantine and protective isolation, by providing information on them to healthcare and public	N	Y	Y	WHO provides appropriate recommendations on its website, for use in information. Useful to curb rumours.
Measures on international public transport targeted at travellers leaving infected area				
Recommendation to tell staff about influenza-like symptoms.	N	Y	Y	
Placement of sick passengers in separate section (if possible)	N	Y	Y	On flights departing from pandemic areas all passengers are provided with mouth-nose mask
Notification of sickness of passenger to health authorities of his country of departure and arrival and country where change of means of transport took place (airline is obliged to notify only country of arrival)	Y	Y	Y	Established requirement for country of arrival, but not uniformly implemented in practice
Notification of epidemiological information necessary for tracing those exposed to health authorities or relevant countries	N	Y	Y	Countries are in direct contact in order to effect appropriate transfer of information

APPENDIX 4

Reducing the risk of human infection during an avian influenza epidemic affecting poultry

Summary

For those working with birds, the risk of avian influenza infection is small, but it appears to vary between different avian influenza virus types with high pathogenicity. Infection takes place through direct contact from infected birds, their secretions, and products derived from them.

Protective measures are based on the following principles:

1. Infection prevention in birds/poultry
2. Minimisation of number of potentially exposed persons
3. Technological measures
4. Provision of information and education
5. Appropriate use of personal protective equipment
6. Appropriate use of antiviral drugs
7. Seasonal influenza vaccination, particularly during influenza season
8. Close surveillance of exposed persons/employees

Every preventive measure must be evaluated in accordance with local situation and risk assessment.

Risks for people working with birds

For those working with birds, the risk of infection is small, and appears to vary between different avian influenza virus types with high pathogenicity. The risk of infection by the avian influenza virus considered the most dangerous, A/H5N1, would seem to be very low. In South-East Asia, the avian influenza epidemic (A/H5N1) has been considerably widespread in recent years, but relative to extent, surprisingly few human infections have occurred. Protection of employees involved in destruction of poultry has often been inadequate, but in spite of this they have not been found to become infected. Although symptom-free infections in humans are possible, it is unlikely that severe forms of the disease would have remained undetected.

Finnish and EU occupational safety and health legislation

Section 40 of the Occupational Safety and Health Act (738/2002) covers biological risk factors at work. Under the Occupational Safety and Health Act, the Government decision on

protection of employees from danger caused by biological factors at work (1155/1993) and the Ministry of Social Affairs and Health decision on classification of biological factors (229/1998) have been given. They have taken into account the equivalent European Union directives that have since been collated into a combined European Parliament and Council Directive (2000/54/EU) on the Protection of Workers from Risks Related to Exposure to Biological Agents at Work.

The above regulations define the employer's obligations, such as assessment and identification of risks, measures to minimise risks, personal protection, special measures for laboratories, animal housing and industrial processes, information and training of employees, notifications to competent authorities, records on exposed employees, and issues of employer-employee cooperation in addressing the issues covered by these regulations. The Occupational Health Care Act and the subsequent Government Decree on medical examinations in work that presents a special risk of illness (1383/2001;1485/2001) contain the regulations on health checks to be carried out by occupational healthcare due to biological factors.

The preventive measures must be based on workplace risk assessment, for which the employer is responsible, as he is also for measures to minimise the risks. General protective measures take precedence over individual measures.

Under the Occupational Safety and Health Act, the Government resolutions on personal protection (1406/1993) and on choice and use of personal protection (1407/1993), that have implemented the corresponding European Union Directives, must be taken into account when using protective devices.

Examples of activities whereby direct contact with infected birds or contaminated material may occur

- Activity on a poultry farm with infected fowl
- Veterinary examinations and autopsy
- Destruction of poultry
- Storage and handling of droppings
- Cleaning and disinfecting of contaminated premises
- Taking samples
- Working in a diagnostic laboratory
- Other activities whereby humans are exposed to infection confirmed in birds or animals, e.g. quarantine staff

On the basis of local risk assessment, it may be expedient to include under potential exposures also persons who live near an infected poultry farm.

Transmission mechanisms

Birds infected by the avian influenza virus excrete large quantities of the virus in their droppings. They may also secrete it through coughing and sneezing, although there is some evidence that the respiratory tract is less significant as infection route in avian influenza A/H5N1. Viruses are not generally stable outside a living cell, but may survive in dust and faeces for several days, even weeks, depending on virus strain and environmental conditions. In humans, avian influenza causes primarily conjunctivitis and respiratory tract infections, although they may also lead to more serious forms of the disease. The conjunctiva of the eye

and membranes of the upper respiratory tract are the most likely infection routes of these viruses. People are infected by avian influenza from direct contact with live infected birds, their faeces or other fluids or secretions of their organs. Touching a contaminated cage, shed or surfaces of other premises where birds have been kept, or touching infected dead birds, may also cause infection and illness in humans, for example if the eyes or nose are rubbed or if feathers lodge under the protective goggles.

When diseased birds are handled in order to destroy them, flapping wings and other movements of the birds, as well as human activity, may cause dust which adds to the risk of infection.

Handling of raw infected poultry meat and blood may cause a risk, if they come into direct contact with the eyes or nose. Cooking poultry meat inactivates/kills the virus and guarantees its safety.

Principles of protection

The directions are based on the European Centre for Disease Prevention and Control (ECDC) guidelines to minimise the risk of humans acquiring highly pathogenic avian influenza from exposure to infected birds or animals.

(http://www.ecdc.eu.int/avian_influenza/H5N1_Occupational_Guidance_ECDC_051019.pdf

Protective measures of employees against work-based infection are based on the following principles:

1. Fast and safe infection prevention in birds/poultry

- The principle is simple: the fewer infections in birds and the sooner the infections are under control, the lower the number of people exposed and infected.
- People can mechanically spread the infection from one flock of birds to another via contaminated hands, shoes and clothing. Therefore, observing appropriate precautions is key in prevention and control of infections. Avian influenza epidemics in poultry are subject to strict control measures under EU legislation (Council Directive 92/40/EEC on Community measures to control avian influenza).

2. Minimising the number of exposures by keeping people away from infected animals

- Destruction of birds must be carried out by only the necessary number of people.
- Farm employees and owners who are not directly involved in the destruction should avoid exposure to known and potential sources of avian influenza, e.g. by avoiding touching fowl, ducks and other poultry whenever possible.
- Other people living on the farm (e.g. family members) should also avoid exposure to known and potential sources of avian influenza virus.
- It may be useful to restrict people's local movements to and from the relevant area.
- Cleaning and handling of laundry and waste should at all stages be carried out safely, until the risk of infection has been eliminated.

3. Technological measures

When handling birds and contaminated materials (e.g. sections of organs, tissues, blood, feathers and secretions, as well as birds' nests) care should be taken not to produce dust or aerosols. Possible measures are:

- destroy the birds either by filling the chicken shed with carbon dioxide (N.B. must ensure sufficient ventilation after gassing, before entering) or, according to EFSA recommendation, by placing the animals in suitable containers in an inert gas mixture, such as argon (not more than 2% oxygen). See Council Directive 93/119/EC
- dampen the dead birds with fine misting of water vapour
- dampen surfaces before cleaning
- use mechanical means of collecting and handling carcasses
- transport dead birds and contaminated material in tightly closed containers

4. Provision of information and education

All persons who are potentially in contact with infected birds and materials must be provided with information and education on human infection by avian influenza and its symptoms, and on preventive and protective measures.

All employees must have at their disposal appropriate personal protective devices, and they must be given directions and training on their use.

5. Use of personal protective equipment

The employer must provide the following required personal protective equipment:

- Waterproof disposable gloves or strong rubber work gloves that withstand disinfection
    - The gloves must be removed immediately after use and disposed of safely, before touching non-contaminated objects and surrounding surfaces
- A respirator mask with at least class P2 biosafety level, the close fitting of which on the face has been personally tested.
    - A fan/filter mask with a hood or visor (class TH2P or higher) may be easier while working, and may be used instead of respirator mask and goggles. It should be noted that if any potentially dangerous gaseous substances are used, other respirator masks may be necessary, depending on the situation and/or substance. This is a minimum requirement, but in the absence of such equipment, any mask that covers the nose and mouth is likely to offer some benefit.
- Protective clothing includes: head cover that fully covers the hair; preferably disposable clothing or overalls and waterproof apron, or long-sleeved surgical protective coat with tight cuffs and a waterproof apron.
- Closely-fitting mask-type eye protectors or goggles, with side shields to prevent virus from entering conjunctiva
- Disposable shoe covers or rubber or polyurethane boots that can be cleaned and disinfected

There must be a facility for safe cleaning and disposal of protective equipment after use. Disposable personal protective equipment must be correctly disposed of, and re-usable equipment must be cleaned and disinfected in accordance with customary disinfection procedures.

Employees must be trained in the correct techniques in putting on, taking off and disposal of personal protective equipment, so they do not contaminate themselves.

Order of removing protective equipment and hand hygiene:

- remove gloves
- remove protective coat
- wash/disinfect hands
- remove eye protector
- remove mask/respirator
- wash/disinfect hands

6. Correct but limited use of antiviral drugs

Use of antiviral drugs must be restricted and it must take place under supervision of a doctor:

- to minimise risk of adverse effects
- to prevent development of drug resistance
- to preserve stocks

Countries with no confirmed epidemic caused by highly pathogenic avian influenza virus

No prophylaxis required for poultry workers.

Countries with one or more confirmed epidemics caused by highly pathogenic avian influenza virus

All employees who are exposed to infected birds or poultry (including birds directly linked to an epidemic caused by highly pathogenic avian influenza virus and birds in adjacent areas that are destroyed as part of local control measures) must be offered prophylaxis. Persons who are retrospectively identified as having been exposed must also obtain prophylaxis.

The local veterinary surgeon and health authority must cooperate in risk assessment, which is based on the local situation, avian influenza virus type and expert assistance, when deciding which persons should be classified as being at risk of exposure.

- Pre-exposure prophylaxis. With the exception of situations where the drug is contraindicative, employees must be given 75 mg of oseltamivir daily, during the time they are in contact with infected poultry and contaminated surfaces. This must continue for seven days after the end of the exposure.
- Oseltamivir is not currently recommended for continuous use of more than six weeks. The risk of side-effects from long-term use is unknown. Canadian health authorities recommend that persons who have used continuous oseltamivir prophylaxis for more than six weeks should have a two-week break before re-starting it. During this time, they should not work in an environment where they may be exposed to a highly pathogenic avian influenza virus.

- Post-exposure short-term prophylaxis: administered after exposure to infected birds, started within 48 hours and continued for at least seven days. With adults and children over 12 months, the dosage is the same as in treatment (according to weight), but administered only once a day rather than twice.
- If oseltamivir has not been administered as prophylaxis and employees present with symptoms indicative of influenza, oseltamivir treatment must be started within 48 hours, adult dosage 75 mg twice daily for five days.

In order to avoid mistaken ideas of full protection, employees taking prophylaxis must be made aware of the need for general protective measures.

7. Seasonal influenza vaccination

Targeted seasonal influenza vaccination is recommended as one of many measures to reduce simultaneous human infections by avian and human influenza viruses. At the same time as reducing potential double infections, opportunities for genetic modification/reorganisation of the virus and appearance of a new influenza virus with pandemic potential are reduced.

It should be noted that this vaccination does not afford protection from avian influenza infection. This must be made clear to exposed persons, so that they understand the necessity of general protective measures.

In addition to the usual target groups, the following should be noted in seasonal influenza inoculations:

- All persons expected to come into contact with poultry or a poultry farm with a possible infection/epidemic caused by a highly pathogenic avian influenza virus, especially those involved in destruction of birds and those living and working on the farms in question.
- Healthcare personnel who in their daily work are in contact with strongly suspected or confirmed human cases of avian influenza.
- Healthcare personnel in frontline medical services in areas with confirmed infections in birds caused by a highly pathogenic avian influenza virus.
- Close contacts of human cases of avian influenza

8. Close surveillance of potentially exposed persons

All persons who have been exposed to poultry, birds or their secretions, must remain under surveillance of themselves, their employer and health authorities. The responsibility for this rests with the employer and through him with the health authority. Occupational healthcare services must be informed, so that they can monitor the employees' health and work capacity, as required by the Occupational Health Care Act. This should be particularly noted in case of relief or temporary employees. Persons who have been involved in destruction of poultry should take their temperature twice daily for two weeks after the last contact with poultry or its surroundings. Any illness (temperature ≥38ºC, cough, sore throat, tightness of chest, but also nausea and diarrhoea) affecting either themselves or their family members must be immediately reported to the health authority. Persons with symptoms must seek out medical examinations and treatment, not self-medicate, limit their social interaction, and stay at home until they have been free of fever for at least 24 hours, except if a diagnosis of influenza has been eliminated.

Employers and subcontractors must keep a register of those exposed. An undertaking to this and the above-mentioned protective measures must be recorded in service contracts. Once the epidemic has ended, a report must be submitted to the health authorities.

APPENDIX 5

Normal areas of responsibility of various organisations and administrative levels and decision-making during the various phases of pandemic alert and pandemic

WHO phases 1 and 2 (interpandemic period)

Definition of phase

Phase 1: New influenza A virus subtypes have not been found in humans. Animals may carry a subtype of the virus which has in the past caused infections in humans, but the risk of infection and illness in humans is small.

Phase 2: New influenza A virus subtypes have not been found in humans, but the virus subtype carried by animals poses a significant risk of infection and illness in humans.

Principal assumptions as basis of planning

- The number of cases will not exceed operational capacity of the system
- The first cases of a potential pandemic virus occur outside Finland, and development leading to a pandemic follows the phases described by WHO

Key perspectives

- Must maintain and reinforce functions aimed at
    - detection of new influenza virus variants and subtypes
    - Detection of annual seasonal influenza
    - Disease loading caused by influenza morbidity and mortality
    - Supporting annual influenza vaccination scheme
- Decision-making and dissemination of information according to normal procedure of administrative sectors

Action

The following permanent surveillance and preparedness actions continue

On national level	**Responsible body**
National Register of Infectious Diseases	NPHI
Virological surveillance of influenza in reference laboratory (molecular-epidemiological analysis, antiviral drug resistance definitions)	NPHI
Clinical surveillance of influenza	NPHI
Excess mortality linked to seasonal influenza	NPHI, STAKES
Direction of clinical microbiology laboratories	NPHI
Mapping of antibody protection of population through sampling	NPHI
Exchange of information with WHO Influenza Network	NPHI
Exchange of information with EU Influenza Surveillance Scheme EISS	NPHI
Exchange of information with the European Centre for Disease Control (ECDC)	NPHI
Assessment of pandemic alert and dissemination of information based on international information	MSAH, NPHI
Maintenance and annual updating of influenza pandemic preparedness plan	NPHI
Pandemic preparedness exercises as collaboration between various organisations	MSAH
Surveillance and control of influenza in animals	MAF, Evira
Other functions (maintenance and development of individual preparedness plans of each administrative sector)	Each administrative sector
On regional level	
Clinical microbiology laboratories report incidences of influenza to National Register of Infectious Diseases	Laboratories, HD
Units of clinical-virological surveillance network send virus samples to national reference laboratory	Laboratories
Review (evaluation) and updating of regional influenza pandemic preparedness plan annually (including private healthcare plans)	SPO, HD
Regional surveillance and control of influenza in animals	SPO, Evira
Municipal level	
Annual public vaccination campaign	HC
Detection of local epidemics in schools and daycare centres	HC
Clinical-virological sentinel surveillance centres	HC
Reviewing and updating of preparedness plan	HC

WHO phase 3 (pandemic alert period)

Definition of phase

New influenza A virus subtype infections from animals to humans occur, but the virus is not transmitted human-to-human, or at most is transmitted occasionally through close contact.

WHO declares transition to phase 3

Principal assumptions as basis of planning

- First cases occur outside Finland

Key perspectives

- Decision-making and dissemination of information according to normal procedure of administrative sectors
- Need for communications within healthcare, between administrative sectors and to the public increases
- Must ensure that Finland has resources to promptly detect human or animal infections caused by a new influenza subtype and to cut off infection chains

Action

The following permanent surveillance and preparedness actions continue

On national level	**Responsible body**
Enhanced situational communication to administrative sectors	MMPS, GMHP, MSAH
NPHI influenza pandemic working group steps up its situational assessment procedure	NPHI
Inter-sector cooperation	MSAH
Assessment of international information and dissemination of information based on it	MSAH, NPHI, MAF
Procurement and adoption of reagents required in diagnostics of new subtype	NPHI, Evira
Securing and coordination of clinical and laboratory diagnostics in healthcare	NPHI
Potential vaccine supplies and reservations	MSAH, NPHI, NAM
Essential reserve supplies (vaccines, drugs, materials)	MSAH, NPHI, NAM, NESA
Updating of national pandemic plan according to new information	MSAH, NPHI, MAF
Ensuring regulations relevant to pandemic situation are up-to-date	MSAH
Functions of other administrative sectors: preparedness in own sector for e.g. morbidity peaks, sickness absences, avoidance of public gatherings and other situations carrying risk of infection, needs for resources, supporting social and health services and cooperation in communications.	All Ministries
Regional level (see also Appendix 1 Regional and local preparedness plans for an influenza pandemic – hospitals)	
Set up regional pandemic preparedness group with regular meetings	SPO, HD
Review (evaluation) and annual updating of regional influenza pandemic preparedness plan	SPO, HD
Ensure that clinical and laboratory arrangements in healthcare are in order, for early detection of possible infections caused by new subtype	HD
Primary healthcare (see Appendix 2 Local preparedness plans for an influenza pandemic – primary healthcare)	**Local authorities**

WHO phase 4 (pandemic alert period)

Definition of phase

A new influenza A virus subtype has caused small disease clusters, indicating that human-to-human transmission is limited. Infection chains are very localised, indicating that the virus is not yet well adapted to humans.

WHO declares transition to phase 4

Principal assumptions as basis of planning

- Clusters occur outside Finland

Key perspectives

- Must ensure that Finland has resources in clinical services and laboratory diagnostics to promptly detect infections caused by a new influenza subtype and to cut off infection chains
- Need for communications within healthcare, between administrative sectors and to the public increases

Action

Depending on the nature and geographical location of the clusters, phase 4 procedures are implemented according to detailed description of phases 3 or 5, as follows:

- Events denoting phase 4 are in countries from which there is no extensive direct passenger traffic to Finland: Procedure as in phase 3.
- Events denoting phase 4 are in countries from which there is extensive direct passenger traffic to Finland: Procedure as in phase 5.

WHO phase 5 (pandemic alert period)

Definition of phase

A new influenza A virus subtype has caused geographically limited large disease clusters. This means increasing adaptation of the virus to humans. Human-to-human transmissibility of the virus does not yet appear fully effective. Pandemic threat is considerable.

WHO declares transition to phase 5

Principal assumptions as basis of planning

- First cases occur outside Finland

Key perspectives

- Decision-making and communications follow emergency procedure: MSAH appoints pandemic coordination group and centralises decision-making in important areas in terms of pandemic prevention and control and social impacts to the Government.

- Must ensure that Finland has resources in clinical services and laboratory diagnostics to promptly detect infections caused by a new influenza subtype and to cut off infection chains
- Need for communications within healthcare, between administrative sectors and to the public increases

Action

On national level	Responsible body

At instigation by MSAH, Government may assume decision-making and coordination particularly in following areas
• Prioritisation of resources of administrative sectors for prevention and control of pandemic alert
• Allocations of responsibility between administrative sectors
• Organisation of responsibilities regarding communications
• Statutory amendments required
• Recommendations regarding restrictions of movement of the public
• Decisions related to international relations or coordination
  • EU: substantive procedures to achieve consensus
  • WHO: substantive procedures to achieve consensus
  • Neighbouring countries: special issues concerning cross-border traffic
• Restriction of international trade
• Initiation of mass vaccinations using appropriate prototype vaccine
• Prioritisation of population groups on medical or other grounds (antiviral drugs, vaccines), reviewing previously established principles on basis of new information
• Emergency supplies and release of supplies in reserve stockpiles
• Rationing of other materials
	MSAH, GOV, MMPS

Centralised coordination adopted in communications related to above areas	Government
Set up control centre for pandemic management	MSAH
Appoint Pandemic Coordination Group (PCG)	MSAH
Coordination of inter-sector technological preparedness cooperation	MSAH, PCG
Reassessment and new guidelines for precautionary measures for healthcare personnel and laboratory operations	MSAH, NPHI, FIOH
Amassing and analysis of epidemiological, clinical and virological information on new virus subtype/disease (WHO, EISS/ECDC)	NPHI, Evira
Management and efficient dissemination of accumulating new information	NPHI, Evira
Procurement, development and adoption on different levels of reagents required in diagnostics of new subtype	NPHI, Evira
Procedures to implement sensitivity definitions of new virus strain	NPHI
Securing and coordination of clinical and laboratory diagnostics in healthcare required for diagnosis of active cases	NPHI
Information gathering and management procedures of real-time case surveillance	NPHI, STAKES
Reassessment and new guidelines for grounds of therapeutic and prophylactic use of antiviral drugs	MSAH, PCG, NPHI
Integration of antiviral drug manufacture, distribution and monitoring procedures to modified criteria for use	MSAH, PCG, NAM
National telephone helpline of healthcare specialists, to direct communications	NPHI
Procurement, orders and release for consumption of vaccines	MSAH, NPHI, NAM
Assessment of immunity in population through antibody sampling	NPHI
Essential reserve supplies (vaccines, drugs, materials)	GOV, MSAH, PCG, NPHI, NAM, FIOH, NESA
Updating of national pandemic plan according to new information	MSAH, PCG, NPHI, MAF
Manpower and training arrangements for management of large case numbers	MSAH, MOE, MOL

On national level	Responsible body
Ensuring regulations relevant to pandemic situation are up-to-date e.g. temporary suspension of treatment guarantee regulations	GOV, MSAH
Information campaign on preventive measures targeted at public	GOV, MSAH, PCG
Each administrative sector has a plan covering its functions in case of high incidence of sickness absence and emergency measures related to the sector • Travel restrictions • Entry into country, border control • International traffic (flights, shipping, rail) • Animals • Education system • Trade restrictions • Ministry of Labour (reserve staff, reception centres)	Each administrative sector
Regional level (see also Appendix 1 Regional and local preparedness plans for an influenza pandemic – hospitals)	
Regional pandemic preparedness group steps up its operation	SPO, HD
Direction of cases of sickness among population (Internet, telephone, media)	HD
Detailed codes of practice on dealing with suspected cases fulfilling criteria in treatment chain, including private healthcare	HD, SPO
Case surveillance based on case definition specific to epidemic situation	HD
Regional measures of restricting public gatherings in cases of possible clusters	SPO, HD
Primary healthcare (see Appendix 2 Local preparedness plans for an influenza pandemic – primary healthcare)	
Direction of cases of sickness among population (Internet, telephone, media)	HC, municipalities
Local home quarantine surveillance and support measures	HC, municipalities

WHO phase 6 (pandemic)

Definition of phase

The virus is fully adapted to humans and spreads among the population, causing widespread epidemics crossing geographic boundaries. A worldwide pandemic is imminent.

Previous experience shows that the first pandemic wave may be followed by a second and possibly even a third wave, caused by a new virus 3-9 months after the first wave ended. The second wave may be as severe or more severe than the first.

Principal assumptions as basis of planning

- Clusters or local epidemics indicating the start of the pandemic have occurred geographically far away; there is an interval of a few weeks before the pandemic arrives in Finland

Key perspectives

- Emergency procedures are adopted in decision-making and communications, if this has not already taken place at phases 4-5 (may be omitted). If an epidemic situation is included in the Emergency Powers Act, invocation of emergency regulations is also possible.

- Must ensure that Finland has resources in clinical services and laboratory diagnostics to promptly detect first infections caused by a new influenza subtype
- Main focus on obtaining pandemic vaccine and preparing for prompt vaccination of the population
- Extensive information disseminated on measures to reduce infections
- Endeavour to quickly detect possible changes in virus properties
- Geographical surveillance of spread of cases
- At the peak of the epidemic, burdening on healthcare will exceed its normal capacity and emergency arrangements are necessary. Timing of the pandemic peak may vary significantly across the regions.

Action

On national level	**Responsible body**

At instigation by MSAH, Government may assume decision-making and coordination particularly in following areas
• Prioritisation of resources of administrative sectors for prevention and control of pandemic
• Allocations of responsibility between administrative sectors
• Organisation of responsibilities regarding communications
• Statutory amendments required
• Recommendations regarding restrictions on movement of the public
• Decisions related to international relations or coordination
  • EU: substantive procedures to achieve consensus
  • WHO: substantive procedures to achieve consensus
  • Neighbouring countries: special issues concerning cross-border traffic
• Restriction of international trade
• nitiation of mass vaccinations using appropriate prototype vaccine
• Prioritisation of population groups on medical or other grounds (antiviral drugs, vaccines), reviewing previously established principles on basis of new information
• Emergency supplies and release of supplies in reserve stockpiles
• Rationing of other materials
	MSAH, GOV, MMPS

Centralised coordination adopted in communications related to above areas	Government
Appointment of Pandemic Coordination Group (PCG)	MSAH
Coordination of inter-sector technological preparedness cooperation. PCG establishes daily procedures for regular contact between key organisations	MSAH, PCG
Reassessment and new guidelines for precautionary measures for healthcare personnel and laboratory operations	MSAH, NPHI, FIOH
Amassing and analysis of epidemiological, clinical and virological information on new virus subtype/disease (WHO, EISS/ECDC)	NPHI, Evira
Management and efficient dissemination of accumulating new information	NPHI, Evira
New definitions on use of clinical and laboratory diagnostics in healthcare, required for case surveillance	NPHI
Redefinition of aims of clinical laboratory diagnostics and code of practice to prevent overloading of laboratories	MSAH, NPHI
International reporting of cases (WHO, EU)	NPHI
Daily national reporting of cases and situation	MSAH, PCG, NPHI
Procurement, development and adoption on different levels of reagents required in diagnostics of new subtype, schedule as allowed by development	NPHI, Evira
Sending of virus strains detected in Finland to WHO system	NPHI
Procedures to implement sensitivity definitions of new virus strain	NPHI
Information gathering and management procedures of real-time case surveillance	NPHI, STAKES
Reassessment and new guidelines for grounds of therapeutic and prophylactic use of antiviral drugs	GOV, MSAH, PCG, NPHI

On national level	**Responsible body**
Guidelines on use of other antimicrobial drugs according to accumulating clinical and epidemiological knowledge	NPHI, infection specialists
Collection of clinical-microbiological data on infections causing complications in influenza patients	NPHI, HD
Integration of procedures of manufacture, distribution and surveillance of antiviral drugs with modified criteria for use	MSAH, PCG, NAM
National telephone helpline of healthcare specialists, to direct communications	NPHI
Procurement of vaccines	STM, KTL
Decisions on use of vaccines (prioritisation issues)	GOV, MSAH, PCG, NPHI
Organising mass vaccinations of population	MSAH, NPHI
Surveillance of coverage of vaccinations and side-effects	NPHI
Assessment of immunity in population through antibody sampling	NPHI
Manpower and training arrangements for management of large case numbers	MSAH, MOE, MOL
Ensuring regulations relevant to pandemic situation are up-to-date - e.g. temporary suspension of treatment guarantee regulations	GOV, MSAH
Information campaign on preventive measures targeted at public	GOV, MSAH, PCG
Based on new epidemiological knowledge, each administrative sector reviews its plan covering all its functions in case of high incidence of sickness absence and emergency measures related to the sector. • Travel restrictions • Entry into country, border control • International traffic (flights, shipping, rail) • Animals • Education system • Trade restrictions • Ministry of Labour (reserve staff, reception centres)	Each administrative sector
Information material to take into account new knowledge of virus causing the pandemic and necessary revisions made	Bodies responsible for communications and media
Guidelines on suspension of emergency measures as pandemic wave subsides	MSAH, PCG, NPHI
On regional level	
Direction of cases of sickness among population (Internet, telephone, media)	HD
Emergency measures in specialist healthcare due to high patient load	HD
Detailed codes of practice on dealing with cases fulfilling criteria in treatment chains, including private healthcare	HD, SPO
Regional organisation of antiviral drugs distribution	HD
Regional supervision of antiviral drugs use	HD
Regional arrangements for storage and distribution of vaccines	HD
Case surveillance based on case definition specific to epidemic situation	HD
Reporting of case and situational surveillance to national level: Hospital District to NPHI and State Provincial Office to MSAH	SPO, HD
Regional measures of restricting public gatherings in cases of possible clusters	SPO, HD
Primary healthcare	
Direction of cases of sickness among population (Internet, telephone, media)	HC
Emergency measures in primary healthcare due to high patient load	HC
Home nursing procedures	HC, municipalities
Real-time case reporting to Hospital District and State Provincial Office	HC
Organising mass vaccinations	HC, municipalities

Latter stage of pandemic and postpandemic period

WHO declares end of pandemic phase. In Finland, the pandemic has ended when the epidemiological indicators of a pandemic have returned to base levels.

During the latter stage of the pandemic and postpandemic period, evaluation of the operation and its results is important.

Vaccines may only be available at this phase.

On national level	**Responsible body**
At proposal by MSAH, the Government makes the decision to return to normal practice from emergency measures required by exceptional circumstances.	MSAH, GOV, MMPS
Risk assessment of new epidemic waves and need for mass vaccinations, if it has not been possible to organise them previously	MSAH, NPHI
Assessment of resources required to combat possible subsequent waves of influenza pandemic, and to evaluate the impacts of the pandemic and of implemented preventive and control measures	GOV, MSAH, MMPS
International cooperation in evaluation of impact of the pandemic and effectiveness of preventive and control measures	GOV, MMPS MSAH, NPHI, administrative sectors
Establish morbidity rate and protection against possible subsequent pandemic waves through antibody sampling of population	NPHI
Execution of mass vaccinations on basis of assessment	MSAH, NPHI
Surveillance of epidemiology and properties of the virus	NPHI
Updating of pandemic plans	Administrative sectors, NPHI
On regional level	
Participation in assessment of impact of pandemic	SPO, HD
Participation in possible implemented mass vaccinations	SPO, HD
Updating of pandemic plan	SPO, HD
Primary healthcare	
Participation in assessment of impact of pandemic	Municipality
Participation in possible implemented mass vaccinations	Municipality
Updating of pandemic plan	Municipality

APPENDIX 6

Using respirator and surgical mouth-nose masks in healthcare

Surgical mouth-nose mask

A surgical mouth-nose mask is usually used by medical and nursing staff to protect the patient from pathogens possibly present in their exhalations. This mask, worn over the mouth and nose, does not protect the wearer from airborne infections. If protection from airborne infections is necessary and no appropriate respirator masks are available, staff caring for the patient must wear a surgical mouth-nose mask until respirator masks have been obtained.

Surgical mouth-nose masks are used throughout the world to protect from blood and secretion spray e.g. during procedures or in caring for isolated patients. If the treatment situations carry a risk of blood or secretion spray, a protective coat and gloves, as well as a visor or goggles are worn.

On mouth-nose masks carrying CE markings as medical devices, the mark signifies that the mask complies with Council Directive 93/42/EEC concerning medical devices (in Finland the Medical Devices Act 1505/1994). Thus, their intention is to protect the patient, but they do not afford the wearer any kind of protection against airborne infection.

In situations where a patient who is infectious through airborne or droplet routes must be transported, the patient may be given a mouth-nose mask. It should be noted that a patient must not be given a respirator mask equipped with an exhalation valve, since it only filters the air one way and thus only protects the wearer, but does not prevent the spread of microbes with exhaled air.

It is also important to teach the patient the correct coughing hygiene. It means placing a disposable tissue tightly over the mouth and nose when coughing, disposing of the tissue immediately, and washing the hands after blowing the nose, sneezing and coughing.

Respirator masks

Respirator masks are used when caring for a patient with a contagious airborne infection (particle size under 5μm). Medical and nursing staff must use an appropriate respirator mask that complies with the standards when treating a patient with a contagious airborne infection. For this purpose, the respirator mask is personal and disposable (single procedure and patient room visit).

Disposable masks both with and without an exhalation valve are available on the market. Respirator masks are classified according to the degree of protection they afford (table). Standard SFS EN 149: 2001 contains the protective capacity requirements and testing methods of these masks. The protective capacity of an FFP*2 class mask must be higher than 92%. The protective capacity of an FFP3 class mask (equivalent to American N-95 mask) must be higher than 98%.

The masks must also carry the CE mark, showing that they comply with Council Directive 89/686/EEC on the approximation of the laws of the Member States relating to personal protective equipment (in Finland Government Resolution 1406/93).

Personal protective devices obtained to protect medical and nursing staff must comply with the above Government Resolution. (Government Resolution 1407/93).

*FF=filtering facepiece, P=particle

Putting on the respirator mask

The FFP2 and FFP3 respirator mask is put on according to manufacturer's instructions (on packaging) in such a way that it fits closely against the face. The tightness of fit must be tested after putting on the mask. The tightness of fit is tested by breathing in deeply after putting on the mask, when the possible airflow between the face and the edge of the mask is discernible.

Table. Respirator masks

Class	Protection capacity	Standards denoting requirements and testing methods	Legislation	Indication for use
Filtering half-mask FFP1	78%*	EN149:2001^	89/686/EEC GovR 1406/93	Low hazard dusts (particle size over 1μm) Not recommended against microbes
Filtering half-mask FFP2	92%*	EN149:2001	89/686/EEC GovR 1406/93	Against dusts hazardous to health e.g. common tuberculosis (particle size over 0,3μm)
Filtering half-mask FFP3	98%*	EN149: 2001	89/686/EEC GovR 1406/93	Against dangerous particles e.g. MDR tuberculosis
Half-mask and filter P3*	98%	EN 140:1998 EN 143:2000	89/686/EEC GovR 1406/93	Against dangerous particles e.g. MDR tuberculosis
Filter mask with fan with a hood or visor TH3P*	99%	EN 12941:1998	89/686/EEC GovR 1406/93	Against dangerous particles e.g. MDR tuberculosis
N-95	95%**	NIOSH 42 CFR 84^^	sale prohibited in Finland without EN149:2001 standard marking	Against dangerous particles e.g. MDR tuberculosis

* tested using 0,6μm particles (NaCl) and 0,3μm paraffin oil particles
** tested using 0,6 μm particles (NaCl)
^ European
^^ American

APPENDIX 7

General hygiene instructions for prevention of respiratory tract infections

Respiratory tract infections, such as RS virus (respiratory syncytial virus), whooping cough and SARS (severe acute respiratory syndrome) are transmitted through:

- Coughing and sneezing
- Hands contaminated by respiratory tract secretions

Stop the spread of microbes:

- Cover your mouth and nose with a disposable tissue when coughing or sneezing
- If you have no tissue, cough or sneeze into the upper part of your sleeve, not into your hands
- Dispose of used tissue immediately
- At medical examinations and treatment in a healthcare establishment, you may be asked to wear a paper mouth-nose mask to protect staff and other patients from infection in case you cough or sneeze

Cleanse your hands immediately after coughing or sneezing:

- Wash hands with soap and water

or

- Cleanse hands with disinfecting hand wipes

APPENDIX 8

Classes of precautionary measures

Customary precautionary measures (including blood precautions) are always taken; the rest are selected according to the microbial transmission route. A microbe may spread via a number of transmission routes, in which case several concurrent classes of precautionary measures should be applied. In such a case, particular attention should be paid to the order of removing the protective equipment, in order to avoid creation of a situation where a person with his own hands contaminates the membranes of the eyes, nose or mouth or spreads the microbe into the environment: 1) remove protective coat/overall and gloves 2) disinfect your hands 3) remove eye protector 4) remove respirator mask 5) disinfect your hands.

	Customary precautionary measures	**Contact isolation**	**Droplet isolation**	**Airborne isolation**
Disinfection of hands with alcohol rinse	Before and after patient contact	As in customary precautions and on entering and leaving room	As in customary precautions and on entering and leaving room	As in customary precautions and on entering and leaving room
Protective gloves	Handling secretions, broken skin, mucous membranes, contaminated areas of patient Disinfection of hands before putting on gloves and after taking them off	As in customary precautions and in close contact patient care	As in customary precautions	As in customary precautions
Polythene apron or single-visit protective coat/overall[1]	When risk of blood or secretion spray	As in customary precautions and in close contact patient care	As in customary precautions	As in customary precautions
Surgical mouth-nose mask	When risk of blood or secretion spray	As in customary precautions	When working at less than 1 m distance from patient	
Visor or goggles	When risk of blood or secretion spray	As in customary precautions	When working at less than 1 m distance from patient	As in customary precautions
Respirator mask[2]				Respirator mask (biosafety class FFP3 or FFP2) always on entering room
Patient room	Normal patient room. Single room, if patient contaminates surroundings with secretions	Single room with own WC and washing facilities	Single room with own WC and washing facilities If not possible, patients must be kept sufficiently far apart (over 1 m)	Single room with separate ventilation system from other premises, negative pressure that can be monitored, and air replaced 6-12 times per hour. Door to patient room must be kept closed
Patient transport	No special measures	Transport only in essential situations. Care taken not to contaminate surroundings during transport	Transport only in essential situations. Patient is taught coughing and hand hygiene[3] and if necessary, equipped with surgical mouth-nose mask to prevent spread of droplets into surroundings	Transport only in essential situations. Patient is taught coughing and hand hygiene3 and if necessary, equipped with surgical mouth-nose mask to prevent spread of particles into surroundings

	Customary precautionary measures	Contact isolation	Droplet isolation	Airborne isolation
Examination and treatment equipment	Cleansing, disinfection or sterilisation depending on method of use	Single room use and disposable recommended, stored ready in room Re-useable to be cleansed and/or mechanically or chemically disinfected or destroyed	Single room use and disposable recommended, stored ready in room Re-useable to be cleansed and/or mechanically or chemically disinfected or destroyed	Single room use and disposable recommended, stored ready in room[4] Re-useable to be cleansed and/or mechanically or chemically disinfected or destroyed4 Must note possible aerosol created when cleansing bronchoscopes, when person preparing instruments should use protection by respirator mask
Stains from secretions	Suitable disinfectant, e.g. with chlorine 500 ppm	As in customary precautions	As in customary precautions	As in customary precautions
Cleaning	Customary cleaning equipment and cleaning agents	Dedicated cleaning equipment for each room, disposable cleaning cloths and customary cleaning agents (disinfectants may be used in accordance with standard hospital practice)	Dedicated cleaning equipment for each room, disposable cleaning cloths and customary cleaning agents (disinfectants may be used in accordance with standard hospital practice)	Dedicated cleaning equipment for each room, disposable cleaning cloths and customary cleaning agents (disinfectants may be used in accordance with standard hospital practice)4
Cutlery	No restrictions	No restrictions	No restrictions	No restrictions
Entertainment equipment	Wiped and disinfected as necessary	As in customary precautions	As in customary precautions	As in customary precautions
Bedding	Mattress and pillow protected if necessary	As in customary precautions	As in customary precautions	As in customary precautions
Secretions	Sluiced as normal, packaged if necessary	As in customary precautions	As in customary precautions	As in customary precautions
Laundry	Careful packaging	Careful packaging in isolation room	As in customary precautions	As in customary precautions
Waste	Careful packaging according to waste classification	Careful packaging according to waste classification	Careful packaging according to waste classification	Careful packaging according to waste classification

1 Protective apron, coat or overall selected according to microbe carried by patient. Long-sleeved coat recommended e.g. when treating SARS and protective overall when treating hemorrhagic fever patient

2 In case of patient in airborne isolation, risk of infection is high during aerosol-producing procedures. They include e.g. endotracheal aspiration, intubation, bronchoscopy, induction of sputum, incorrect handling of secretions containing tuberculosis bacteria, physiotherapeutic treatment of respiratory tract, speech therapy, dental treatment, autopsy

3 Teach patient to cover mouth and nose closely with a tissue and then to dispose of the tissue in a covered waste bag. After blowing the nose and coughing, the hands are washed with soap and water and/or using hand rub.

4 Not necessary in case of patient with stain-positive respiratory tuberculosis

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APPENDIX 9

Antiviral drug logistics in a pandemic situation

The Finnish Government has made preparations for an influenza pandemic by supplementing the emergency drug stocks with antiviral agents of the neuraminidase inhibitor group. The country has obtained 530,000 treatment courses of Tamiflu preparation (oseltamivir) and approx. 770,000 courses of the same oseltamivir preparation in powder form. The intention is to replace the powder preparation later with a licensed preparation in capsule form. The drugs are in a pharmaceutical wholesaler's store ready for a decision to release them. The emergency stocks also contain 100,000 courses of the preparation Relenza (zanamivir) and 1 million courses of Atarin (amantadine).

A small part of the emergency stocks is placed within Hospital Districts, relative to population numbers.

Since the efficacy of antiviral agents held in emergency stockpiles is conditional on its administration within 48 hours of the onset of symptoms, availability, release of emergency stocks and smooth distribution of the antiviral drugs will be critical for the successful outcome of drug therapy.

Government Decree No. 279/2006 stipulates the grounds for releasing emergency stocks. Under it, drugs in emergency stores may be released for use when the Ministry of Social Affairs and Health has decided that it is necessary.

Release of antiviral drugs from emergency stockpiles for consumption

The Tamiflu capsules, as well as the Relenza and Atarin preparations acquired for emergency stocks, have current retail licences allowing them to be released for use without additional measures.

Small quantities of licensed Tamiflu capsules in the reserve stocks should be distributed to hospital pharmacies, e.g. relative to population numbers, as early as the transition stage from WHO pandemic phase 4 to phase 5. The procedures for releasing the reserve stocks and the body responsible for initiation of deliveries must be defined. The Government makes the decision to release reserve stocks and initiation of deliveries is directed by the Ministry of Social Affairs and Health. The National Agency for Medicines is the body responsible for planning the distribution. With regard to initiation of deliveries, the National Agency for Medicines collaborates with the National Emergency Supply Agency, the National Public Health Institute, Hospital Districts and pharmaceutical distributors.

Distribution of antiviral drugs from pharmaceutical wholesalers to influenza clinics

Under the legislation on medications, a pharmaceutical wholesaler is permitted to supply drugs for retail distribution to pharmacies, branch pharmacies, hospital pharmacies and dispensaries. Individual health centres with no dispensary cannot have drugs delivered direct from the pharmaceutical wholesalers. Using procedures stipulated in section 62 of the Medicines Acts, hospital pharmacies and dispensaries may redistribute drugs to primary healthcare units situated in the area of the same local authority, joint municipal board, or a local

authority adjacent to them. In addition, with permission from the National Agency for Medicines, a hospital pharmacy or dispensary may, subject to certain limitations, supply drugs to a private healthcare unit or another social and healthcare institution and pharmacy. This licensing procedure requires an application in accordance with the Medicines Act, section 62, subsection 4, which in a pandemic situation must be capable of being discharged through a quick, simplified procedure, or the section of the law must be amended in this respect in case of a pandemic situation. Amendment of the Medicines Act will need to be considered, in order that the National Agency for Medicines licensing and hearing procedure may be bypassed in a pandemic situation.

Alternatively, the drugs may be delivered from the pharmaceutical wholesaler's stocks to a pharmacy, and from the pharmacy to health centres. By delivering drugs via the pharmacy network, the normal medical supplies distribution network may be utilised, one of the operational principles of which is that pharmaceutical wholesalers deliver within 24 hours of the order. On the other hand, this method of distribution disperses antiviral drug stocks to hundreds of interim stores (about 800 pharmacy outlets in total), making monitoring of drug consumption and quantities more difficult, as well as securing of stocks.

Because the quantity of antiviral drugs in the reserve stocks is finite, the risk of break-ins to drug warehouses in a pandemic situation increases, and particular attention must be paid to the security of drug transportation and stores; constant guarding of drug warehouses must be considered.

Supply of antiviral drugs to patients

In a pandemic situation, it is epidemiologically justified to ensure that the patient obtains the medications he needs from the healthcare units where his diagnosis is established. It is not justifiable that the infected patient moves on from the influenza clinic to a pharmacy, and thus likely contributes to the spread of the pandemic. This procedure does not require amendments in the relevant legislation.

Because distribution of drugs from health centres, with the exception of stand-by packs, is not a part of the normal operation of health centres, the procedures must be planned in advance. The additional storage facilities required for the drugs and the personnel resources required for their distribution must be assessed. Under normal circumstances, pharmacies are responsible for ensuring that patients are given sufficient information and instructions for the safe use of a drug. Employees of health centres do not have equivalent expertise or statutory duty to provide drugs advice, which must be taken into account in the markings on the packaging and content of the instructions for use of the drugs to be distributed. Alternatively, distribution of drugs at an influenza clinic might be implemented as collaboration of the local pharmacy and health centre, so that the pharmacy provides its pharmacists for the use of the health centre to dispense the drugs.

In order that the desired benefit is gained from the exceptional method of distribution of antiviral drugs (instead of the pharmacy, the patient obtains his drugs from the health centre), created in order to curb the spread of a pandemic, it is important that after the visit to the influenza clinic, the patient does not need to go to the pharmacy to obtain the drugs intended for self-medication. The public must be instructed to obtain the necessary self-medication preparations to be kept at home before the pandemic begins, at the latest at transition to WHO pandemic phase 5.

Monitoring of antiviral drug consumption

Under normal circumstances, the National Agency for Medicines monitors consumption of drugs and maintains statistics based on sales figures obtained from pharmaceutical wholesalers. These statistics are based on the numbers of drug packs supplied by the wholesalers. Since the stocks of antiviral agents held in emergency stockpiles are limited, in a pandemic situation it is important to possess constant information also of the drug quantities available in retail distribution outlets. Procedures must be created for this monitoring of consumption, so that the information on available drug quantities and their storage locations may be utilised in epidemiological surveillance of the pandemic situation.

Proposed measures:

Release of antiviral drugs from emergency stockpiles for consumption

- The National Agency for Medicines initiates planning of the release of pharmaceutical preparations held in emergency stocks
- The National Agency for Medicines assesses whether, in a pandemic situation, all the antiviral drugs to be used should be distributed via hospital pharmacies to influenza clinics, or whether the normal drug logistics network might be utilised.
- The National Agency for Medicines draws up the guidelines to protect drug stocks and transportation from break-ins
- The National Agency for Medicines plans the procedures for real-time monitoring of consumption of drugs in emergency stockpiles
- In planning measures and procedures, the National Agency for Medicines works in cooperation with the National Public Health Institute Department of Infectious Disease Epidemiology, in order that the progress of the epidemic may be taken into account in distribution of the drugs and monitoring of consumption.

Supply of antiviral drugs to patients (under section 65 of the Medicines Act)

- The National Agency for Medicines plans the distribution logistics for influenza clinics and the supply requirements
- Healthcare institutions ensure that influenza clinics have sufficient facilities for appropriate and secure storage of the drugs
- The National Agency for Medicines designs the procedures for collaboration between healthcare and pharmacies, to enable drugs advice when dispensing drugs from health centre to patient
- The National Agency for Medicines draws up instructions for obtaining self-medication drugs from pharmacies, and is responsible for their publication jointly with NPHI

Monitoring of antiviral drug consumption

- The National Agency for Medicines sets up the procedures for monitoring drug stocks at treatment centres: reporting procedures and responsibilities for database maintenance to be agreed

APPENDIX 10

Development phases of a pandemic

Interpandemic period	
Phase 1	New influenza A virus subtypes have not been found in humans. Animals may carry a subtype of the virus which has in the past caused infections in humans, but the risk of infection and illness in humans is small.
Phase 2	New influenza A virus subtypes have not been found in humans, but the virus subtype carried by animals poses a significant risk of infection and illness in humans.
Pandemic alert period	
Phase 3	New influenza A virus subtype animal-to-human infections occur, but the virus is not transmitted human-to-human, or at most is transmitted occasionally through close contact.
Phase 4	A new influenza A virus subtype has caused small disease clusters, indicating that human-to-human transmission is limited. Infection chains are very localised, indicating that the virus is not yet well adapted to humans.
Phase 5	A new influenza A virus subtype has caused geographically limited large disease clusters. This means increasing adaptation of the virus to humans. Human-to-human transmissibility of the virus does not yet appear fully effective. Risk of a pandemic is considerable.
Pandemic period	
Phase 6	The virus is fully adapted to humans and spreads in the population, causing widespread epidemics crossing geographic boundaries. A worldwide pandemic is imminent.
Postpandemic period	
	Return to interpandemic period.

APPENDIX 11

Voluntary Rescue Service member organisations

- Autoliitto / Automobile and Touring Club of Finland
- Finlands Svenska Marthaförbund
- Folkhälsan
- Johanniitat / St. John Ambulance Finland
- Maa- ja kotitalousnaisten Keskus / Rural Women's Advisory Organisation
- Maanpuolustuskoulutus ry / National Defence Training Association of Finland
- Maanpuolustuskiltojen liitto / Finnish Defence Guilds' Federation
- Maanpuolustusnaisten liitto [Defence forces women's federation]
- Mannerheimin Lastensuojeluliitto / Mannerheim League for Child Welfare
- Marttaliitto / Martha Organisation
- Reserviläisliitto / Finnish Reservists' Association
- Sukeltajaliitto / Finnish Divers' Federation
- Suomen Ilmailuliitto / Finnish Aeronautical Association
- Suomen Latu / Central Association for Recreational Sports and Outdoor Activities
- Suomen Liikunta ja Urheilu / Finnish Sports Federation
- Suomen Meripelastusseura / Finnish Lifeboat Society
- Suomen Metsästäjäliitto [Finnish hunting federation]
- Suomen Mielenterveysseura / Finnish Association for Mental Health
- Suomen Moottoriliitto / Finnish Motorcycling Federation
- Suomen Palveluskoiraliitto / Finnish Working Dog Association
- Suomen Partiolaiset / Guides and Scouts of Finland
- Suomen Pelastusalan Keskusjärjestö / Finnish National Rescue Association
- Suomen Pelastuskoiraliitto / Finnish Association of Search and Rescue Dogs
- Suomen Punainen Risti / Finnish Red Cross
- Suomen Radioamatööriliitto / Finnish Amateur Radio League
- Suomen Reserviupseeriliitto / Finnish Reserve Officers' Federation
- Suomen Sinibarettiliitto [Suomen Rauhanturvaajat] / Finnish Blue Berets Peace-Keeping Veterans
- Suomen Taksiliitto / Finnish Taxi Association
- Suomen Tiepalvelumiehet [Finnish voluntary roadside assistance]
- Suomen Tiepalvelumiesliitto [Finnish voluntary roadside assistance federation]

- Saving
- Suomen Veneilyliitto / Finnish Boating Association
- Veteraanisuunnistajat [Veteran orientieers]
- WWF Finland
- Finnet-liitto / Finnet Association
- Naisten Valmiusliitto [Women's preparedness association]
- Suomen Ammattiliittojen Keskusjärjestö / Central Organisation of Finnish Trade Unions (SAK)
- Suomen Humanitaarisen Oikeuden Seura [Finnish society for humanitarian justice]
- Suomen Kuntaliitto / Association of Finnish Local and Regional Authorities
- Suomen Lääkäriliitto / Finnish Medical Association
- Suomen Naisjärjestöjen Keskusliitto / National Council of Women of Finland
- Suomen Nuorisoseurojen Liitto / Finnish Youth Association
- Suomen Osuuskauppojen Keskuskunta / S Group
- Tapio
- Teollisuuden ja Työnantajain Keskusliitto / Confederation of Finnish Industries
- Työturvallisuuskeskus / Centre for Occupational Safety

APPENDIX 12

National Public Health Institute communications during the pandemic alert and pandemic

1 Informing the population

The National Public Health Institute disseminates information to the population mainly via healthcare personnel. Information is provided on the NPHI website for the needs of the authorities, healthcare personnel, reporters and the public. The aim is that the citizen should receive information that is reliable, clear and consistent, as locally as possible, from his own doctor, health centre and local paper, so that he is able in his part to act in the desired safe manner.

The responsibility for training the personnel in such a way that the questions and needs of the public are answered as well as possible, and panic reactions are avoided, remains with the Hospital District.

Prepared material on A/H5N1 avian influenza may be found on the NPHI website at www.ktl.fi/lintuinfluenssa. The website is updated continuously.

Topics 5.12.2006

The epidemic situation
Questions and answers on avian influenza
Questions and answers on avian influenza and pandemic vaccinations
Frequently asked questions on avian influenza
Articles
Guidelines to travellers
Finland prepares for the pandemic
National preparedness plan for an influenza pandemic – MSAH
General hygiene instructions
Avian influenza instructions for healthcare

Prepared material on influenza on NPHI website www.ktl.fi – Tietoa terveydestä – Infektiotaudit - Influenssa. The website is updated continuously:

Topics 5.12.2006

Influenza
Influenza surveillance
Frequently asked questions on influenza vaccinations
Influenza laboratory

2 Informing healthcare actors

Communications follow the same standard procedure as is followed in an epidemic or other situation demanding particular attention. The existing system is secured and reinforced by adding new recipients as necessary, mainly agencies of the authorities (see diagram).

Dissemination of information follows a graded model, with the responsibility for dissemination shared both nationally, regionally and locally between several authorities. The information is distributed by email, fax and text message. The main focus is on maintenance of the websites.

Each organisation is responsible for its own communications and their development. However, NPHI seeks close cooperation with other organisations in epidemic communications.

Prepared material on A/H5N1 avian influenza may be found on the NPHI website at http://www.ktl.fi/portal/suomi/osiot/terveyden_ammattilaisille/ohjeita_ja_suosituksia/uudet_ohjeet_lintuinfluenssasta_a_h5n1/ . The website is updated continuously.

Topics 5.12.2006

Suspected human case of A/H5N1 avian influenza
Microbiological tests
Safety requirements in viral culture
Using respirator masks in healthcare
Classes of precautionary measures
Guidelines to travellers www.ktl.fi/lintuinfluenssa
More information on avian influenza www.ktl.fi/lintuinfluenssa
Guidelines during an avian influenza epidemic of poultry or wild birds
Prophylactic use of oseltamivir in exposure situations
General hygiene instructions
Presentations of pandemic seminars

2.1 Target groups and their definitions

In defining target groups, NPHI takes into consideration the recipients' responsibilities, duties and operational opportunities in the Hospital District, province and between authorities.

Named reserve persons should be designated for all primary recipients.

2.1.1 Hospital Districts

Primary recipients of information in Hospital Districts are persons responsible for infectious diseases: doctors in charge of infectious diseases in the Hospital District and hygiene nurses. Within Hospital Districts, the recipients of the information are in charge of its dissemination to local authorities, doctors and nurses responsible for infectious diseases in health centres. Within the health centre, the recipients of the message ensure that the information is passed on to their operational units. The Hospital District is also responsible for internal communications in hospitals to the management, laboratory and key operational units.

2.1.2 Provincial Medical Officers

Provincial Medical Officers are responsible for informing private healthcare units. The State Provincial Offices have a national and up-to-date register of addresses of all private healthcare operational units.

2.1.3 Other authorities

The Ministry of Social Affairs and Health, Ministry for Foreign Affairs, Finnish Food Safety Authority (Evira), Finnish Institute for Occupational Health (FIOH), Defence Forces and Border Guard Department distribute the information bulletin to their own target groups. NPHI has agreed with the Finnish Institute for Occupational Health that the latter will distribute the information bulletin to all occupational health operational units, including in health centres.

Emergency actions

Telephone meetings and video conferences may be held and contacts maintained between the authorities through the VIRVE telephone network.

2.1.4 NPHI internal distribution

has been specified, and includes e.g. the Director General, Deputy Director General, Communications Manager, Heads of Departments, telephone exchange.

2.1.5 The Finnish News Agency (FNA) and Finfood

are listed as recipients of NPHI epidemic bulletins.

Emergency actions

2.1.6 As required, new executive authorities are added to the distribution list.

2.2 Maintaining contact details of target groups and testing the operation

Contact details are maintained in the NPHI contacts management system, with changes made in the system automatically updated both on the NPHI email server and the Sonera CStream service as an FTP transfer. NPHI has a number of staff who are able to operate the contacts management system and update and view addresses. To send a release or information bulletin (email, fax and text message), the Sonera CStream service is used, with the email service maintained by the NPHI IT unit as backup. The connections are tested at least once a month by sending an email to all the recipients in the Hospital Districts and provinces. This way, obsolete addresses are updated, and the Hospital Districts are able to check for the necessity

of updating their own recipient addresses. The Department has drawn up written instructions on sending an epidemic bulletin.

2.3 Pros and cons of graded responsibility

Information about an incident first reaches the Hospital District which is responsible for prevention of infectious diseases in its area and for providing information on them. The NPHI bulletin does not contain detailed regional operational instructions, but indicates the aims and operational model of the action. When forwarding the bulletin, the Hospital District expert on infections issues regional detailed instructions for action and agrees on regional division of duties.

The strength of the Hospital District is its knowledge of the functions and human resources in its own area. Addition of the Hospital District comments and guidelines adds to the delay in the bulletin reaching health centres, but facilitates subsequent overall management of the situation. It is extremely important that the time delay is also noted at NPHI. The bulletin or advance warning of it must be sent in sufficiently good time for all parties to be able to respond to it.

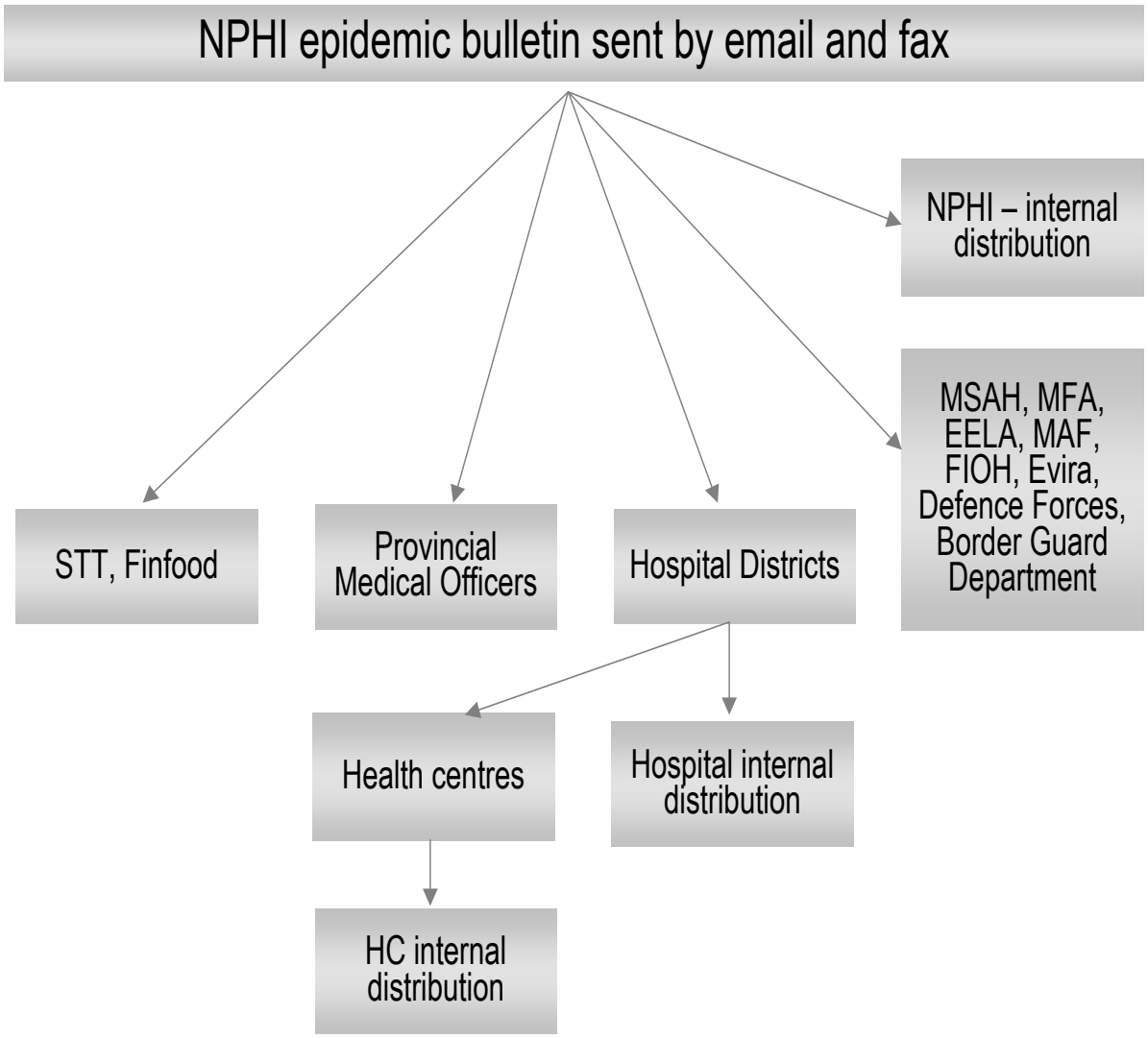
2.4 Improving communication plans of Hospital Districts

Hospital Districts should draw up clear written instructions on regional communications policy. The instructions should stress the obligation of all recipients to forward the information, especially in a pandemic situation. Detailed mapping of the Hospital District helps to identify weak and strong areas in the region. When they are known in advance, the weak links that need to be strengthened are identified.

The instructions must clearly define: Who are responsible for forwarding the information to local authorities? Who are the regional contact persons? Who maintains contact details? Where are the contact details maintained? What methods are used? Email, fax, Internet or intranet. Who are the reserve persons? Consideration should also be given to which functions may be outsourced. The need for IT support and persons responsible for communications should be included in the plan.

The communications plan should be released so that all parties are clear on what is expected of each other.

Passage of epidemic bulletin



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Pandemic preparedness plans of other countries

Links to the pandemic preparedness plans of other countries are on the WHO website at
http://www.who.int/csr/disease/influenza/nationalpandemic/en/

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APPENDIX 14

Abbreviations

CDC	Centers for Disease Control and Prevention, USA
DG SANCO	Directorate General for Health and Consumer Affairs, EU
ECDC	European Centre for Disease Prevention and Control
EISS	European Influenza Surveillance Scheme
EMEA	European Agency for the Evaluation of Medicinal Products
NABHCE	National Advisory Board on Health Care Ethics
EU	European Union
EVIRA	Finnish Food Safety Authority
NESA	National Emergency Supply Agency
KELA	Social Insurance Institution of Finland
NPHI	National Public Health Institute
MTI	Ministry of Trade and Industry
SPO	State Provincial Office
NAM	National Agency for Medicines
MTC	Ministry of Transport and Communications
MAF	Ministry of Agriculture and Forestry
GMHP	Government Meeting of the Heads of Preparedness
OIE	World Organisation for Animal Health
MOJ	Ministry of Justice
MOE	Ministry of Education
PCG	Pandemic Coordination Group
MOD	Ministry of Defence
NBED	National Board of Economic Defence
HD	Hospital District
MOI	Ministry of the Interior
FRC	Finnish Red Cross
STAKES	National Research and Development Centre for Welfare and Health
MSAH	Ministry of Social Affairs and Health
EED Centre	Employment and Economic Development Centre
NAMA	National Authority for Medicolegal Affairs
HC	health centre
MOL	Ministry of Labour
FIOH	Finnish Institute for Occupational Health
MFA	Ministry for Foreign Affairs
MOF	Ministry of Finance
GOV	Government
PMO	Prime Minister’s Office
WHO	World Health Organization
VFS	vital functions of society
ME	Ministry of the Environment

APPENDIX 15

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The Advisory Board on Communicable Disease has been consulted during the drafting.

The National Advisory Board on Health Care Ethics has issued its statement which has been taken into account in preparation of the Pandemic Plan.

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