



## MEETING REPORT

# European pandemic influenza planning assumptions

Stockholm, 20–21 January 2009

## 1 Background

Most governments of industrialised countries, and international bodies such as WHO, the wider United Nations System and the European Commission, have in recent years been planning for the next pandemic<sup>1,2</sup>. All European countries have pandemic plans of some kind, mostly conforming to the original WHO 2005 template (which is being revised in 2009). Many of these plans involve explicit or implicit planning assumptions about what can be expected during a pandemic. That is, qualitative and quantitative assumptions of how a pandemic virus might behave. Qualitative assumptions may include the pandemic virus' modes of transmission and incubation period, while quantitative assumptions include estimates on spread and impact on individuals, services and societies including the rough estimates of attack rate and case fatality rate.

The assumptions have generally been arrived at in two different ways: Planners and those responsible for services have defined the information they need (e.g. for hospitals this may include 'how many people per day per unit of population (or as a proportion of number of sick people) can we expect to require hospitalisation at the peak of the pandemic?' and for businesses 'what percentage of our workforce can we expect to be unavailable for work at the peak of a pandemic, and for how long?'); Epidemiologists, modellers and other researchers have investigated what happened in the four 'modern' pandemics (those beginning in 1889, 1918, 1957 and 1968), or used modelling techniques to make reasonable estimates of assumptions from observed basic technical parameters (incubation period, basic reproduction number, etc.). Sometimes these two approaches have been combined, at other times they have been separate. It was noted that the WHO<sup>1</sup> document of 2005 had no quantitative planning assumptions, the European Commission<sup>2</sup> had some assumption values with no ranges, and that the quantitative assumptions used by European countries are sometimes quite variable<sup>3</sup>. ECDC presented a summary of different countries' assumptions, based on input from the attendees at the meeting.

<sup>1</sup> World Health Organization. WHO Global Influenza Preparedness Plan. Geneva 2005  
[http://www.who.int/csr/resources/publications/influenza/WHO\\_CDS\\_CSR\\_GIP\\_2005\\_5.pdf](http://www.who.int/csr/resources/publications/influenza/WHO_CDS_CSR_GIP_2005_5.pdf)

<sup>2</sup> Communication from the Commission to the Council, the European Parliament, the European economic and social committee and the committee of the regions on pandemic influenza preparedness and response planning in the European Community  
[http://eur-lex.europa.eu/LexUriServ/site/en/com/2005/com2005\\_0607en01.pdf](http://eur-lex.europa.eu/LexUriServ/site/en/com/2005/com2005_0607en01.pdf)

<sup>3</sup> Mounier-Jack S, Coker RJ How prepared is Europe for pandemic influenza? Analysis of national plans. Lancet 2006 Apr 29;367(9520):1405-11

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Stockholm, May 2009

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## 2 Objectives of the meeting

This focused meeting held at ECDC was to bring together some of those engaged in formulating these assumptions at a European level with the specific objectives of:

1. gathering together the assumptions used in and within countries (national versus local perspective) and those recommended by international bodies;
2. discussing which assumptions are useful for planners;
3. discussing the differences in assumptions among European countries and whether they matter;
4. identifying gaps and agreeing on whether or not a European consensus on planning assumption ranges would be useful and what further work should be undertaken.

## 3 Discussions and conclusions

It was recognised that making pandemic planning assumptions is difficult because pandemics are not standard. There were important differences between the four modern pandemics. In addition, individual pandemics have had different impacts on different countries and different impacts even within one country<sup>1,4</sup>. Hence, even though advance planning has to be based on some kind of default values, there will also need to be flexibility because of these uncertainties. The modellers at the meeting emphasised the uncertainty represented in their models, and that it is impossible to make accurate predictions on what the next pandemic will look like in any detail. Assumptions can be made in advance but then will have to be adjusted with different input values depending on initial observations made early on in the next pandemic. One country (the UK) explained how it plans to undertake 'now-casting'<sup>5</sup> and forecasting in order to adjust assumptions during a pandemic<sup>6</sup>. This highlighted the importance of surveillance during a pandemic, estimating what ECDC refers to as the 'strategic parameters'<sup>7</sup> (the document is currently being updated with input from ECDC and WHO 2008 meetings), and through a process which WHO calls 'early comprehensive assessment'. It was noted that countries have to decide whether to plan for the best, the worst or something in between.

A number of European countries have considered two options in their planning; one for a mild pandemic where the health and other services will get through without too much difficulty, and the other where more robust measures will be needed. WHO is planning for a three-level scale, while the United States has proposed a more complex five-level scale<sup>8</sup>. Different countries have made different decisions on this, often for internal reasons, such as what would be the maximum that their healthcare systems could deal with. Hence the meeting concluded that European countries could reasonably decide on somewhat different planning assumptions, though the meeting noted that it might be problematic at border regions if countries had very different estimates of the assumptions.

It was agreed that some further work (both modelling and literature search) is needed, specifically on:

1. technical parameters (basic reproductive number, incubation period, serial time, etc.);
2. likely impact parameters following from (1) (attack rates, case fatality rates, hospitalisation rates, consultation per week, duration of the pandemic, absenteeism, etc.);
3. intervention parameters (effects of interventions like school closure, social distancing, protection measures (like masks), etc.).

Though it was noted that some of (2) and (3) were contained in the modelling and epidemiological work from the UK group<sup>15</sup>. Some countries might characterise the effects of the interventions differently in their own settings because of social, demographic and cultural differences. There was also a need for more qualitative information on how a pandemic would be expected to behave. Further, the effects of different interventions, and of mixing interventions, were considered it be too difficult to measure ahead of time.

<sup>4</sup> On the state of the public health - The Annual Report of the Chief Medical Officer of the Department on Health and Social Security for the year 1969 D.o.H.a.S. Security, Editor. 1969, Her Majesty's Stationary Office. p. 39-45.

<sup>5</sup> Making estimates as to the current numbers and patterns of infection in a pandemic and constantly adjusting these as time and the pandemic advances

<sup>6</sup> [http://www.ecdc.europa.eu/pdf/080409\\_meeting\\_pan.pdf](http://www.ecdc.europa.eu/pdf/080409_meeting_pan.pdf)

<sup>7</sup> [http://www.ecdc.europa.eu/Health\\_topics/Pandemic\\_Influenza/flu\\_surv.html](http://www.ecdc.europa.eu/Health_topics/Pandemic_Influenza/flu_surv.html)

<sup>8</sup> United States Department of Health and Human Services and Centers for Disease Prevention and Control. Interim pre-pandemic planning guidance: Community strategy for pandemic influenza Mitigation in the United States. Dec 2006

[http://www.pandemicflu.gov/plan/community/community\\_mitigation.pdf](http://www.pandemicflu.gov/plan/community/community_mitigation.pdf)

The meeting concluded that it would not be desirable to reach consensus on a single set of European planning assumptions but that there could usefully be agreement on the underlying technical parameters.

The meeting learned of a number of research projects that presented estimated values for the technical parameters from past pandemics and outbreaks, these included the MIDAS project<sup>9</sup> funded by the US National Institute of Health and several projects funded by the European Commission: ModelRel<sup>10</sup>, SarsTrans<sup>11</sup>, InfTrans<sup>12</sup>, SarsControl<sup>13</sup> and FluModCont<sup>14</sup>. It was noted that planners need information considerably simpler than that found or used by the researchers or used by the modellers, who need to make specific assumptions about the structure of the population and fit the model to this. One of the most sophisticated sets of assumptions, based on a synthesis of the input from both communities was that from the UK which was devised by a modelling and epidemiological group serving the Department of Health<sup>15</sup>.

The forthcoming 2009 planning guidance from WHO, including some planning assumptions, was presented. Some countries have produced pandemic planning software tools that local planners can use, the best known being the United States CDC's FluSurge<sup>16</sup>. The participants commented that such tools felt like a 'black box' and it was important to understand and present all the assumptions included in these tools rather than just accepting their outputs. However, these tools can, for example, usefully estimate the needed bed and mechanical ventilator occupancy at the peak of a pandemic. Such assumptions were noted to be lacking in many countries' plans. One consistent observation among participants was that planning assumptions based on national observations or models tend to smooth out local variation and may thus both over- and underestimate the severity of local epidemics in a pandemic. Hence local planning assumptions will need to allow for more variance on peak values than national assumptions.

The ECDC table summarising different countries' assumptions was found useful but it was agreed that the definitions of the parameters need to be made precise and explicit (e.g. does 'hospitalisation rates' mean hospitalisation rate among the ill or of the whole population? Currently this is not clearly stated.) It was welcomed that WHO envisages a three-level severity scale for pandemics. Hence countries wanting to give a range of planning assumptions could contain a range of values for a set of different scenarios (mild, average or severe). The meeting did not feel it would be helpful to have 'European planning assumptions', especially not anything distinct from those of WHO, but it would be useful for countries to make their assumptions explicit in order to allow countries to compare values between themselves.

For the technical parameters it was agreed that a flu-specific paper linking parameters with planning assumptions was a necessary tool. It was agreed that those in the FluModCont Project would prepare a short paper on what is presently known of the technical parameters and present this and other important information at the next Influenza Section meeting of the Health Security Committee with a view to this then becoming a European Publication.

<sup>9</sup> <http://www.nigms.nih.gov/Initiatives/MIDAS/>

<sup>10</sup> [http://ec.europa.eu/health/ph\\_projects/2003/action2/action2\\_2003\\_03\\_en.htm](http://ec.europa.eu/health/ph_projects/2003/action2/action2_2003_03_en.htm)

<sup>11</sup> <http://www.sarstrans.org>

<sup>12</sup> <http://www.infrans.org/>

<sup>13</sup> [http://ec.europa.eu/research/fp6/ssp/sarscontrol\\_en.htm](http://ec.europa.eu/research/fp6/ssp/sarscontrol_en.htm)

<sup>14</sup> <http://www.flumodcont.eu/>

<sup>15</sup> <http://www.advisorybodies.doh.gov.uk/spi/minutes/spi-m-modellingsummary.pdf>

<sup>16</sup> <http://www.cdc.gov/flu/tools/flusurge/>

## Annex 1. Workshop agenda

### 20 January 2009

Chairs: *Piotr Kramarz and Tommi Asikainen*

- 08:30 – 09:00 Registration
- 09:00 – 09:10 Welcome talk  
*Piotr Kramarz, Deputy Head of Scientific Advice Unit*
- 09:10 – 09:50 Introduction  
*Tommi Asikainen, Mathematical Modeller Scientific Advice Unit*  
*Franz Karcher, DG Sanco, European Commission*
- 09:50 – 10:10 Presentation of preliminary ECDC work on assumptions  
*Bartosz Pedzinski, Medical University of Bialystok, Poland*  
*Angus Nicoll, Influenza coordinator, Scientific Advice Unit*
- 10:10 – 10:40 Presentation of WHO work on pandemic assumptions  
*Kidong Park, WHO Geneva*
- 10:40 – 10:50 Discussion
- 10:50 – 11:20 Coffee break
- 11:20 – 11:40 Assumptions gathered in United Kingdom  
*Peter Grove, Department of Health, United Kingdom*
- 11:40 – 12:10 Assumptions gathered in ModelRel and Infrans projects  
*Steve Leach, Health Protection Agency, Porton Down*  
*Simon Cauchemez, Imperial College*
- 12:10 – 12:20 Discussion
- 12:20 – 13:50 Lunch
- Chair: *Angus Nicoll*
- 13:50 – 14:30 Session on pandemic plans in some selected countries  
*Invited discussants: Steffen Glismann and Peter Grove*  
Pandemic planning assumptions in Lithuania  
*Nerija Kupreviciene State Public Health Service under Ministry of Health, Lithuania*  
Pandemic planning assumptions in Sweden  
*Anette Hulth, Swedish National Board of Health and Welfare*  
*Anders Tegnell, Swedish National Board of Health and Welfare*
- 14:30 – 14:50 Discussion on the uses and form of planning assumptions  
*Tommi Asikainen, Mathematical Modeller Scientific Advice Unit*  
*Angus Nicoll, Influenza coordinator, Scientific Advice Unit*
- 14:50 – 15:20 Group work on uses and form of planning assumptions
- 15:20 – 15:50 Coffee break
- 15:50 – 16:20 Group work on uses and form of planning assumptions
- 16:20 – 17:00 Presentation of group work on uses and form of planning assumptions  
*Rapporteurs*
- 17:00 – 17:30 Assumption gathered in the MIDAS project  
*Gary Smith, University of Pennsylvania*  
*Irene Eckstrand, National Institute of Health, United States*
- 19:00 Dinner

## 21 January 2009

Chair: *Tommi Asikainen*

- 09:00 – 09:20 FluModCont presentation  
*Andrea Pugliese, Trento University, Italy*  
*Caterina Rizzo, ISS, Italy*
- 09:20 – 09:50 Presentation and comparison of national assumptions  
*Bartosz Pedzinski, Medical University of Bialystok, Poland*  
*Angus Nicoll, Influenza coordinator, Scientific Advice Unit*
- 09:50 – 10:10 Discussion
- 10:10 – 10:40 Coffee break
- 10:40 – 12:00 Group work on possible ranges of national assumptions. Identifying obvious gaps
- 12:00 – 13:20 Lunch
- Chairs: *Angus Nicoll and Piotr Kramarz*
- 13:20 – 14:00 Presentation and discussion of the group work  
*Rapporteurs*
- 14:00 – 14:20 Coffee break
- 14:20 – 14:50 Decision on continuing work, coordination and further meetings
- 14:50 – 15:00 Attempt of consensus. Discussion on whether further work is necessary  
*Piotr Kramarz, Deputy Head of Scientific Advice Unit*  
*Tommi Asikainen, Mathematical Modeller Scientific Advice Unit*  
*Angus Nicoll, Influenza coordinator, Scientific Advice Unit*
- 15:00 Meeting adjourns

## Annex 2. List of participants

| <b>Name</b>                | <b>Country</b>  | <b>Affiliation</b>  |
|----------------------------|-----------------|---|
| Dr. Borislav Aleraj        | Croatia         | Croatian National Institute of Public Health                      |
| Dr. Steffen Glismann       | Denmark         | Seruminstitutet   |
| Dr. Matthias an der Heiden | Germany         | Robert-Koch Institute   |
| Dr. Guðrún Sigmundsdóttir  | Iceland         | Landlaeknir   |
| Prof. Andrea Pugliese      | Italy           | University of Trento  |
| Dr. Caterina Rizzo         | Italy           | ISS, Rome   |
| Dr. Nerija Kupreviciene    | Lithuania       | State Public Health Service under Ministry of Health              |
| Dr. Siri Hauge             | Norway          | Folkhelseinstituttet  |
| Mr. Bartosz Pedzinski      | Poland          | Medical University of Bialystok                                   |
| Mr. Baltazar Nunes         | Portugal        | Instituto Nacional de Saúde Dr. Ricardo Jorge                     |
| Dr. Florin Popovici        | Romania         | Centre for Prevention and Control of Communicable Diseases        |
| Dr. Ivan Bakoss            | Slovak Republic | Public Health Authority of the Slovak Republic                    |
| Dr. Amparo Larrauri        | Spain           | Instituto de Salud Carlos III                                     |
| Dr. Anette Hulth           | Sweden          | Swedish National Board of Health and Welfare                      |
| Dr. Anders Tegnell         | Sweden          | Swedish National Board of Health and Welfare                      |
| Prof. Dr. Levent Akin      | Turkey          | Turkish scientific committee for pandemic planning                |
| Dr. Simon Cauchemez        | United Kingdom  | Imperial College  |
| Dr. Peter Grove            | United Kingdom  | Department of Health  |
| Dr. Steve Leach            | United Kingdom  | Health Protection Agency, Porton Down                             |
| Dr. Irene Eckstrand        | USA             | National Institute of Health                                      |
| Dr. Gary Smith             | USA             | University of Pennsylvania  |
| Dr. Todd Weber             | USA             | CDC Atlanta (liaison officer at ECDC)                             |
| Dr. Franz Karcher          |                 | European Commission, Directorate-General for Health and Consumers |
| Dr. Michala Hegermann      |                 | WHO Regional Office for Europe, Copenhagen                        |
| Dr. Kidong Park            |                 | WHO HQ, Geneva  |
| Dr. Andrea Ammon           |                 | ECDC, Surveillance Unit   |
| Dr. Tommi Asikainen        |                 | ECDC, Scientific Advice Unit                                      |
| Dr. Bruno Ciancio          |                 | ECDC, Scientific Advice Unit                                      |
| Dr. Piotr Kramarz          |                 | ECDC, Scientific Advice Unit                                      |
| Dr. Vicente Lopez          |                 | ECDC, Scientific Advice Unit                                      |
| Dr. Angus Nicoll           |                 | ECDC, Scientific Advice Unit                                      |
| Dr. Flaviu Plata           |                 | ECDC, Surveillance Unit   |
| Dr. Rene Snacken           |                 | ECDC, Preparedness and Response Unit                              |