



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^{1,2}. 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 WHO¹ document of 2005 had no quantitative planning assumptions, the European Commission² had some assumption values with no ranges, and that the quantitative assumptions used by European countries are sometimes quite variable³. ECDC presented a summary of different countries' assumptions, based on input from the attendees at the meeting.

¹ 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

² 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

³ 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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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^{1,4}. 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'⁵ and forecasting in order to adjust assumptions during a pandemic⁶. This highlighted the importance of surveillance during a pandemic, estimating what ECDC refers to as the 'strategic parameters'⁷ (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 scale⁸. 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 group¹⁵. 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.

⁴ 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.

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

⁶ http://www.ecdc.europa.eu/pdf/080409_meeting_pan.pdf

⁷ http://www.ecdc.europa.eu/Health_topics/Pandemic_Influenza/flu_surv.html

⁸ 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

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 project⁹ funded by the US National Institute of Health and several projects funded by the European Commission: ModelRel¹⁰, SarsTrans¹¹, InfTrans¹², SarsControl¹³ and FluModCont¹⁴. 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 Health¹⁵.

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 FluSurge¹⁶. 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.

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

¹⁰ http://ec.europa.eu/health/ph_projects/2003/action2/action2_2003_03_en.htm

¹¹ <http://www.sarstrans.org>

¹² <http://www.infrans.org/>

¹³ http://ec.europa.eu/research/fp6/ssp/sarscontrol_en.htm

¹⁴ <http://www.flumodcont.eu/>

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

¹⁶ <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

Name	Country	Affiliation
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