The 2009 Pandemic Influenza and Worst-Case Scenarios

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**Background:** at the start, level of anxiety was very high (1918 or 1957/68?)

- **23/4:** virus identified (Winnipeg, Atlanta)
- **24/4:** WHO raises world alert
- **26/4:** US declares sanitary emergency
  - **17/4:** first cases signaled in the US
  - **17/4:** Mexico declares sanitary emergency
- **27/4:** WHO → phase 4 (pandemic alert)
  - **29/4:** the French government pushes emergency up to level 5
- **29/4:** WHO → phase 5 (pandemic imminent)
- **11/6:** WHO → phase 6 (pandemic in progress)
Geneva under the spell of worst-case scenario?

- May 11, mortality in Mexico has been deemed « moderate », i.e. 1957, 1968 (N Ferguson et al., Imperial College)
- Summer 2009: Many people (lay and experts) stuck to a 1918-19 ‘Spanish’ flu analogy!
- Dr Chan (August 29, Le Monde): “Since the emergence, a few years ago, of the bird flu virus (H5N1), a very severe illness with 50 to 60 per cent cases lethal, ministers of Health have discussed with the WHO how to organize the preparedness and response to pandemic threat following the pattern of the ‘Spanish’ influenza.”
SARS (2003): a dress rehearsal?

- pandemic flu shadowing SARS
- A social and psychology experiment
- political and economical shock?
- An easy victory... won thanks to “medieval methods” (Dr Mark Ryan, WHO, IHT 23 July 03)
- A new public health emerged from SARS
- WHO gained an increasing ‘political’ clout over global public health (IHR revision 2005)
2005: the “Bird Flu Year”

- Bird flu at the top of priorities of the WHO
- The worst epizootic ever
- 2005: nb of human cases twice as high as in 2004 (142 cases; lethality = 50 per cent)
- WHO coordinator Nabarro: 2<x<150 million deaths
- Good news:
  - Serologic survey 2002: infectivity not death
  - Surveillance: WHO extended its network
  - Vaccines: clinical trials began early 2006
- Bad news: Indonesia refused to share H5N1 samples with WHO
- An economic worst-case scenario
- Alert subsided in 2008: “World better prepared” (Nabarro, Jan 2008)
‘Spanish’ flu as template (I)
‘Spanish’ flu as template (II)

• One single question: would a pandemic be as lethal as the ‘Spanish’ flu (US: 2.5; Europe: 4 per cent)?

• Main characteristics of the 1918-19 pandemic:
  ▫ Mortality 20fold the expected rate
  ▫ High proportion of complications
  ▫ High incidence among 5-15 years old
  ▫ High mortality among 15-34 years old
  ▫ 3 waves within 8-9 months (1889-91 ‘Russian’ flu=3waves within 3 years)
  ▫ Automnal wave simultaneous in both hemispheres
Flu seen through the lens of Thucydides

- Historians associate the 1918-19 pandemic with rapid expansion of transportation by sea and by rail boosted by global war
- ‘Spanish’ flu as a template for the understanding of epidemics: a health (massive destruction) as well as a social crisis (massive disorganisation), i.e. nothing but Thucydides’ famous description of the plague of Athens
- The Thucydides’ paradigm forms the basis of most of pandemic influenza plans
The rise of worst-case scenario: U.S. National Pandemic Influenza Plans

source: HHS Pandemic Influenza Plans, 2005

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<tr>
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<th>Moderate (1958-68) [2004]</th>
<th>Severe (1918) [2005]</th>
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</thead>
<tbody>
<tr>
<td>Attack rate</td>
<td>90 million (30%)</td>
<td>90 million (30%)</td>
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<td>Visit to the doctor</td>
<td>45 million</td>
<td>45 million</td>
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<tr>
<td>hospitalization</td>
<td>865 000</td>
<td>9,9 million</td>
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<tr>
<td>deaths</td>
<td>90000&lt;x&lt;209000</td>
<td>1,9 million</td>
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More than fear: worst-case scenario and the rise of preparedness

- An event not irrational as much as unpredictable
  - Chance
  - Perversity of nature
  - Non-existent entity
- Preparedness: a strategic-epidemiologic culture
- All-hazards planning
- A tremendous old over decision-makers
Britain, May-July 2009: a worst-case scenario for real?

- 27 April: first cases (in Scotland) back from Mexico
- 14 June: first death (mother delivered of a soon-to-die baby)
- 24 June: from containment to contamination mitigation: cases clinically confirmed → cases x 5fold overnight
- 2 July: « 100 000 new cases per day? 40 deaths/day? » (Secretary Andy Burnham in the Commons)
- Week # 28 (ending 12 July): 55 000 new cases [next slide]
- August: incidence decreased; H1N1= approx. 10 per cent of symptomatic cases
England: Incidence of 2009 A(H1N1)

source: Donaldson LJ et al., BMJ 2009; 339:b5213
Mortality rate: a weak tool for managing the pandemic

- 1918-like: the basic concept of the British pandemic plan
- 8 May: “neither seasonal flu, nor ‘Spanish’ flu” (CMO): 1957, 1968
- In England (2009) severity came through 3 phases:
  - Worst-case scenario: most telling story = CMO’s statements: July: 65000 deaths → September: 19000 → October: 1000
  - Surge in anxiety when cases clinically confirmed: an « explosion » of cases in September (CMO); 35% attack rate, big troubles in the health-care system (N Ferguson)
    - Huge decrease in retrospective studies (Nov-Dec)
  - Estimate of mortality fluctuated greatly: June=0.25% in June → December=0.026% (1957, 1968=0.2%)
- Dr Th Francis (Science 12 March 1943: 230): pandemic, not a question of severity, but of distribution
- Estimate of a pandemic severity available only many months after it starts
- Pragmatic use of history
Avenues of historical analogy

- Worst-case scenario frequently based on historical analogies
- Incorporated comparison:
  - 2009 mortality and morbidity same age structure than 1918
  - 1976/1918: 2 virus ‘antigenically related’ (A/H1N1)
- 1976: CDC-NIAID-Merck strongly disagreed with ACIP
- Media and Congress toyed with memories of the ‘Spanish’ flu
- The theory of the 10-year recurrence of influenza pandemics
- Who controls historical analogies?
- Rejection of concrete probability
The irony of best-case scenario

• 11 June: geographic distribution, not severity
• Conceptual vision (preparedness), pandemic plans, technical hurdle (estimating severity) and historical analogies (likelinesses/likelihoods) combine to strengthen the hold of WCS
• Harvard epidemiologist Marc Lipsitch (*Nature* 10 June 10): “It is ironic, as we watch for the second time in five years the catastrophic results of ‘best-case scenario planning’ in the Gulf of Mexico, to have the WHO coming under criticism for planning for, and raising awareness of, the possibility of a severe pandemic.”