Comparison of 1918-19 & 2009 H1N1 Influenza Pandemics: Epidemiology and Lessons Learnt

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Acknowledgements: University of Otago and the Maurice and Phyllis Paykel Trust
- Epidemiology
- Global spread
- Control measures
- Lessons learnt
<table>
<thead>
<tr>
<th>Year</th>
<th>Disease</th>
<th>Influenza Strain</th>
<th>Estimated Mortality</th>
</tr>
</thead>
<tbody>
<tr>
<td>1889</td>
<td>‘Russian flu’</td>
<td>H3N2</td>
<td>~1 million</td>
</tr>
<tr>
<td>1918-19</td>
<td>‘Spanish flu’</td>
<td>H1N1</td>
<td>50-100 million</td>
</tr>
<tr>
<td>1957</td>
<td>from Asia</td>
<td>H2H2</td>
<td>~2 million</td>
</tr>
<tr>
<td>1968</td>
<td>from Asia</td>
<td>H3N2</td>
<td>~1 million</td>
</tr>
<tr>
<td>2009</td>
<td>‘Swine flu’</td>
<td>H1N1</td>
<td>~19,000</td>
</tr>
</tbody>
</table>
1918-19 waves

The Spanish Influenza. Chart showing mortality from the 1918 influenza pandemic in the US and Europe (Nicholls 2006).
2009 waves

H1N1 2009 cases in New Zealand (Southern Hemisphere)


H1N1 2009 cases in England (Northern Hemisphere)

Global spread in 1918
Rapid spread in 2009

Geographic spread of influenza activity

Geographic spread reflects the number and distribution of regions within a country reporting influenza activity.

Status as of Week 30
20 Jul - 26 Jul 2009

The boundaries and names shown and the designations used on this map do not imply the expression of any opinion whatsoever on the part of the World Health Organization concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. Dotted lines on maps represent approximate border lines for which there may not yet be full agreement.

Data Source: World Health Organization
Map Production: Public Health Information and Geographic Information Systems (GIS)
World Health Organization

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Influenza & Pneumonia mortality in US, 1911-1918

H1N1 2009 mortality in US

From Taubenberger & Morens (2006): 1918 Influenza: the Mother of All Pandemics

From Centre for Disease Control (2009): 2009 H1N1 Early Outbreak and Disease Characteristics
Other risk factors

- Socio Economic Status
- Ethnicity
- Preexisting conditions
- BMI
- Pregnancy
## 1918-19 Control Measures

<table>
<thead>
<tr>
<th>Country/Region</th>
<th>Public Health Measures</th>
<th>Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>Australia</td>
<td>Early introduction of strict maritime quarantining and reporting.</td>
<td>Delay of first cases of pandemic and less virulence of pandemic strain.</td>
</tr>
<tr>
<td>Pacific Island Jurisdictions</td>
<td>Varying degrees of maritime quarantine were used throughout the South Pacific.</td>
<td>Some success in delaying and/or excluding the pandemic.</td>
</tr>
<tr>
<td>Iceland</td>
<td>Partial road closures and naturally glacial ice barrier provided quarantine effect.</td>
<td>Reduced mortality/morbidity in the isolated areas. However, 1921 outbreak resulted in high mortality.</td>
</tr>
<tr>
<td>US</td>
<td>Various US cities introduced containment measures such as mask-wearing and social distancing measures.</td>
<td>Early introduction of measures resulted in lower rates of morbidity and mortality from the pandemic.</td>
</tr>
<tr>
<td>Country</td>
<td>Anti-viral prophylaxis &amp; treatment</td>
<td>Community Mitigation Measures</td>
</tr>
<tr>
<td>------------</td>
<td>------------------------------------------------------------------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Australia</td>
<td>Oseltamivir was used for persons with moderate to severe illness, and high-risk populations.</td>
<td>Some school closures. Initial border screening at international airports.</td>
</tr>
<tr>
<td>Chile</td>
<td>Oseltamivir was given to persons with ILI.</td>
<td>No school closures Travel restriction recommendations. Health questionnaires and information dissemination at borders.</td>
</tr>
<tr>
<td>New Zealand</td>
<td>Oseltamivir was given to persons with ILI and their contacts.</td>
<td>Some schools closed for brief periods. Public health messages encouraged ILI cases to stay at home.</td>
</tr>
<tr>
<td>US</td>
<td>Oseltamivir was given to persons with ILI and high-risk populations.</td>
<td>Some school closures. Dissemination of guidance on personal hygiene, use of antivirals, facemasks, and respirators. No travel restrictions or border screening measures implemented</td>
</tr>
</tbody>
</table>

ILI = Influenza-like illness
Adapted from Assessment of the 2009 Influenza A (H1N1) Outbreak on Selected Countries in the Southern Hemisphere
EPIDEMIC INFLUENZA (SPANISH)

This Disease is Highly Communicable. It May Develop Into a Severe Pneumonia.

There is no medicine which will prevent it.
Keep away from public meetings, theatres and other places where crowds are assembled.
Keep the mouth and nose covered while coughing or sneezing.
When a member of the household becomes ill, place him in a room by himself.
The room should be warm, but well ventilated.
The attendant should put on a mask before entering the room of those ill of the disease.

TO MAKE A MASK

ISSUED BY THE PROVINCIAL BOARD OF HEALTH

SWINE FLU SPREADS!

- Feds fear virus could turn deadly in U.S.
- Mayor says don’t panic as cases confirmed

EVERYTHING YOU NEED TO KNOW — SEE PAGES 4-6
Lessons learnt

- Some common features for both pandemics: eg pattern of spread, risk factors for serious illness & mortality
- Enormous variation in impact (mortality)
- 1918 - greater use of quarantine and social distancing measures
- 2009 – more reliance on anti-virals and vaccines and limited use of public health measures
San Francisco 1918

Mexico City 2009