Universal Immunisation against Influenza - the pros

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Interests statement

• Chair, WHO Euro TAGE - ex officio WHO SAGE
• Member UK DofH JCVI & subcommittees (Pneumo, HPV, Varicella)
• Research projects funded by Pfizer & GSK
• Current vaccine-related consultancy funded by industry concern HepB and pertussis vaccines - income is paid to employers
• No other benefits (travel, hotels, registration etc.) from industry
• No pharma shares or IP
Flu - why the fuss?

- Significant annual epidemics with morbidity and resources usage especially in the young and the elderly and mortality in the elderly

Risk of global pandemics and related Armageddon scenarios

See @cambridgeWG
Peak times..
Old idea - direct protection

• Immunise the elderly

• Immunise high risk groups, including pregnant women

• Stop them getting sick and dying
Europe - universal flu

Recommendations for kids

- Austria - IIV - 7m to 15y RbnF
- Finland 6m-3y - IIV & LAIV funded
- Latvia IIV 6m-2y funded
- Malta - IIV 6m-5y RbnF
- Poland IIV 13m-19y RbnF
- Slovakia IIV 6m-12y funded
- Slovenia IIV 6m-2y RbnF
- UK 2y-7y LAIV funded
- LAIV in Germany Sweden Norway

http://vaccine-schedule.ecdc.europa.eu/Pages/Scheduler.aspx
New idea - indirect protection

- Immunise children universally
- Block transmission of flu
- Protect not only those at high risk but also much larger low risk group...
Infectiousness

Onset illness

Virus in secretions

1 2 3 4 5 Days

Adult

Young child
Cluster randomised study

- Isolated Hutterite communities in Canada
- 950 children aged 3-15y in 50 communities
- Randomised to TIV or HepA vaccines
- 2300 unimmunised people studied for flu
- 3.1% of unimmunised people in immunised communities got PCR+ flu vs 7.6% in unimmunised communities (61% effective)

Loeb et al 2010 JAMA
“New” vaccine - LAIV

- Nasal spray - high acceptability
- Efficacious in young children (but only licensed for >2 y)
Efficacy of LAIV Relative to Placebo

UK - universal LAIV

- 2013-14 Introduced for 2 year olds - changed to 2-3 year olds (1 dose each). Primary school children (5-10 yo in pilot areas)
- 2014-15 2-4 year olds 1 dose. More pilots including secondary schools (11+)
- 2015-16 2-7 year olds.
- 2016-17 2-7 year olds.
- 2017-18 2-7 year olds.
2015-16 results (H1N1 & B year)

<table>
<thead>
<tr>
<th></th>
<th>Crude vaccine efficacy (VE) (95% CI)</th>
<th>VE adjusted for age, sex, month, area and surveillance scheme</th>
</tr>
</thead>
<tbody>
<tr>
<td>Influenza A (H1N1)</td>
<td>54.1 (43 - 63.1)</td>
<td>54.5 (41.6 - 64.5)</td>
</tr>
<tr>
<td>Influenza B</td>
<td>62.4 (47.7 - 73)</td>
<td>54.2 (33.1 - 68.6)</td>
</tr>
</tbody>
</table>

Pebody et al Eurosurveillance 22 Sept 2016
School pilot schemes 2014-15 England

- 2014-15 (year 2)
- Large seasonal epidemic
- Mostly H3N2 then B
- Both significantly drifted from vaccine strains

Pebody et al. Eurosurveillance Oct 2015
Coverage in schools

Pebody et al. Eurosurveillance Oct 2015
GP diagnosed ILI

GP diagnosed ILI

Primary
Secondary
None

Pebody et al. Eurosurveillance Oct 2015
Excess respiratory mortality

Excess mortality rate per 100,000 population

Week number

Primary
Secondary
None

Pebody et al. Eurosurveillance Oct 2015
Weekly ILI consultation rates across UK countries, 2015-16

7+ pilot areas only

England

Scotland

Wales

Northern Ireland

No 7+

All 7-11
<table>
<thead>
<tr>
<th>Disease</th>
<th>Transmission</th>
<th>$R_0$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measles</td>
<td>Airborne</td>
<td>12–18</td>
</tr>
<tr>
<td>Diphtheria</td>
<td>Saliva</td>
<td>6–7</td>
</tr>
<tr>
<td>Smallpox</td>
<td>Airborne droplet</td>
<td>5–7</td>
</tr>
<tr>
<td>Polio</td>
<td>Fecal-oral route</td>
<td>5–7</td>
</tr>
<tr>
<td>Rubella</td>
<td>Airborne droplet</td>
<td>5–7</td>
</tr>
<tr>
<td>Mumps</td>
<td>Airborne droplet</td>
<td>4–7</td>
</tr>
<tr>
<td>HIV/AIDS</td>
<td>Sexual contact</td>
<td>2–5</td>
</tr>
<tr>
<td>Pertussis</td>
<td>Airborne droplet</td>
<td>5.5$^2$</td>
</tr>
<tr>
<td>SARS</td>
<td>Airborne droplet</td>
<td>2–5$^3$</td>
</tr>
<tr>
<td>Influenza (1918 pandemic strain)</td>
<td>Airborne droplet</td>
<td>2–3$^4$</td>
</tr>
<tr>
<td>Ebola (2014 Ebola outbreak)</td>
<td>Bodily fluids</td>
<td>1.5–2.5$^5$</td>
</tr>
</tbody>
</table>

H1N1 now 1.4
5 reasons to vaccinate your child against flu

- There's now a safe and effective nasal spray vaccine to protect children aged two years and older against flu.
- The vaccine is easy to give and painless and has been used safely in other countries for a number of years.
- Flu can be a nasty illness that can lead to a stay in hospital, especially for children with other medical conditions like heart disease and diabetes.
- If your child gets flu they won't be able to go to school/nursery for several days and will need to be cared for at home. You may have to take time off to look after them.
- Protecting your child can stop the flu spreading to other children or she may come into contact with, and to the rest of the family, in particular to grandparents, who may be at particular risk from flu.

What should I do?

If your child is two, three or four years of age, your GP will contact you to arrange a vaccination appointment. If you haven't heard by the middle of October contact your surgery to request an appointment.

For more information visit: www.nhs.uk/child-flu

Flu Immunisation 2014/15
Helping to protect everyone, every winter