Influenza Vaccination of Health Care Workers -

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Outline

- Influenza in the tropics
- Rationale and purpose of HCW vaccination
- Efficacy of HCW vaccination
- Approaches to improve HCW vaccination
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Percentage of respiratory specimens that tested positive for influenza
By influenza transmission zones

Status as of week 42
30 Oct – 05 Nov 2011

Note: The available country data were joined in larger geographical areas with similar influenza transmission patterns to be able to give an overview (www.who.intcsr/disease/swineflu/transmission_zones/en). The displayed data reflect reports of the stated week, or up to two weeks before if no data were available for the current week of that area.

Data Source: WHO/GIP, data as of 03 November 2011.
Data used are from FluNet (www.who.int), 13:26 UTC snapshot, from WHO regional offices and/or ministry of health websites.

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 be full agreement.
Recommended composition of influenza virus vaccines for use in the 2012 southern hemisphere influenza season

September 2011

It is recommended that the following viruses be used for influenza vaccines in the 2012 influenza season (southern hemisphere):

– an A/California/7/2009 (H1N1)pdm09-like virus;
– an A/Perth/16/2009 (H3N2)-like virus;
– a B/Brisbane/60/2008-like virus.
Burden of influenza in the tropics

Lee VJ et al., 2009; PLoS ONE 4(12): e8096
“The number of deaths attributable to each significant influenza epidemic was much higher than that caused by any other known man-made or natural cause during the same period”

Lee VJ et al., 2009; PLoS ONE 4(12): e8096
Thailand’s National Avian Influenza Surveillance (NAIS) system
January 2004 through December 2006
“While each new case of AI received global media attention, the NAIS system identified approximately 80 times as many human influenza infections.”
More deaths due to human influenza compared to avian H5N1 (22 vs 17)

Seasonal distribution

2005 Society for Healthcare Epidemiology in America (SHEA) position paper
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Rationale for HCW vaccination

- HCWs are routinely infected with influenza virus just like the general population
  - May be at higher risk because of regular contact with patients with influenza
- Infected HCWs may shed the virus before the development of clinical symptoms or during mild illness not recognised as ILI.
- HCWs have frequent contact with high risk patients
- HCWs routinely report to work despite being ill.
The purpose of vaccinating HCWs

- to prevent transmission to patients, including those with a lower likelihood of vaccination response themselves;
- to reduce the risk that the HCW will become infected with influenza;
- to create “herd immunity” that protects both HCW and patients who are unable to receive vaccine or unlikely to respond with a sufficient antibody response;
- to maintain a critical societal workforce during disease outbreaks; and
- to set an example concerning the importance of vaccination for every person.
Nosocomial Pandemic (H1N1) 2009, United Kingdom, 2009–2010

- 30 patients with nosocomially acquired influenza
- 12 (80%) of 15 adults and 14 (93%) of 15 children had serious underlying illnesses.
- The most common illnesses were
  - hematologic malignancy for adults (5),
  - and congenital abnormality or prematurity (7) or malignancy (4) for children.
- 8 (27%) of 30 died

Enstone JE et al., Emerg Infect Dis. 2011 Apr
Unvaccinated HCWs Transmit Influenza to Vulnerable Patients

- In neonatal intensive care units
  - Influenza outbreaks can last for 2-4 weeks
  - 19/54 infants infected and one died; only 15% (13/86) of staff had been immunized
  - 12/13 with inter current fever were infected; no staff had been immunized
  - Sick HCWs who continued to work were most likely source of contagion

- In organ transplant units
  - 4/12 patients tested influenza positive (33%)
  - Each patient was in an individual room and 3/4 had no visitors
  - 3/27 (11%) HCWs on the ward also developed influenza
  - None of the infected nurses had been vaccinated

## Self-reported Rates of Presenteeism

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Reported Showing Up to Work Sick at Least Once During the Year, No. (%) [95% CI]</th>
<th>( P ) Value&lt;sup&gt;a&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Postgraduate training year</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 (n = 253)</td>
<td>131 (51.7) [45.6-57.9]</td>
<td>.01</td>
</tr>
<tr>
<td>2 (n = 284)</td>
<td>177 (62.3) [57.1-68.4]</td>
<td></td>
</tr>
<tr>
<td>Sex</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Men (n = 210)</td>
<td>117 (55.7) [48.6-62.2]</td>
<td>.58</td>
</tr>
<tr>
<td>Women (n = 327)</td>
<td>193 (59.0) [53.4-64.1]</td>
<td></td>
</tr>
<tr>
<td>Country of medical school graduation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>United States (n = 414)</td>
<td>243 (58.7) [54.1-63.7]</td>
<td>.39</td>
</tr>
<tr>
<td>Other (n = 123)</td>
<td>66 (53.7) [46.0-63.8]</td>
<td></td>
</tr>
<tr>
<td>Specialty&lt;sup&gt;b&lt;/sup&gt;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Internal medicine (n = 193)</td>
<td>108 (56.0) [48.6-62.8]</td>
<td>.51</td>
</tr>
<tr>
<td>Pediatrics (n = 160)</td>
<td>100 (62.5) [54.6-69.8]</td>
<td></td>
</tr>
<tr>
<td>General surgery (n = 94)</td>
<td>51 (54.2) [45.1-65.5]</td>
<td></td>
</tr>
<tr>
<td>Obstetrics/gynecology (n = 73)</td>
<td>43 (58.9) [47.3-70.4]</td>
<td></td>
</tr>
</tbody>
</table>

Abbreviation: CI, confidence interval.
<sup>a</sup>By \( \chi^2 \) test.
<sup>b</sup>Number of respondents sums to 520 because 17 residents did not identify specialty on survey.
Risk of Exposure and Transmission of Influenza

Risk of exposure/ transmission

- **HCW with close patient contact with direct patient care**
  - Physician
  - Nurses
  - Emergency personnel
  - Nursing assistants
  - Students and trainees

- **HCW with occasional patient contact**
  - Technicians
  - Physiotherapists
  - Dietary/catering personnel
  - Housekeeping personnel
  - Pharmacists

- **HCW with limited contact**
  - Laboratory personnel
  - Maintenance personnel
  - Clerical personnel
  - Administrative support

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Trivalent subunit vaccines are safe and 70-90% effective in adults with mild side effects in fewer than 10% of recipients.

Effectiveness depends on the vaccine "match" or antigenic relatedness to the circulating virus.

Influenza vaccine is less effective in protecting persons at highest risk for developing severe influenza-related disease than it is for young healthy adults.
Efficacy of Influenza Vaccination in Healthcare Workers in a Tropical Setting

Table 2. Frequency of Influenza-like Illness (ILI) in Vaccinated vs Non-vaccinated Healthcare Workers

<table>
<thead>
<tr>
<th></th>
<th>ILI</th>
<th>No ILI</th>
<th>Relative risk (95% confidence interval)</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>No vaccine</td>
<td>182</td>
<td>148</td>
<td>1.13 (0.98-1.13)</td>
<td>0.11</td>
</tr>
<tr>
<td>Vaccinated*</td>
<td>132</td>
<td>79</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vaccinated with matched vaccine*</td>
<td>36</td>
<td>96</td>
<td>0.49 (0.37-0.66)</td>
<td>0.0000001</td>
</tr>
<tr>
<td>Vaccinated with mismatched vaccine*</td>
<td>49</td>
<td>24</td>
<td>1.22 (1.01-1.47)</td>
<td>0.082</td>
</tr>
</tbody>
</table>

Table 3. Documented Medical Leave Taken Vaccinated vs Non-Vaccinated Healthcare Workers

<table>
<thead>
<tr>
<th></th>
<th>Mean medical leave taken for each visit ± SD</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unvaccinated</td>
<td>0.299 ± 0.449</td>
<td></td>
</tr>
<tr>
<td>Vaccinated</td>
<td>0.260 ± 0.595</td>
<td>0.406</td>
</tr>
<tr>
<td>Matched vaccine</td>
<td>0.134 ± 0.280</td>
<td>&lt;0.001*</td>
</tr>
<tr>
<td>Mismatched vaccine</td>
<td>0.392 ± 0.925</td>
<td>0.014†</td>
</tr>
</tbody>
</table>

* Compared with unvaccinated
† Compared with mismatched vaccine
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Despite increased awareness of the importance of influenza vaccination of HCWs and large-scale campaigns at many hospitals, vaccination rates in most countries remain below 50%
Barriers to Vaccination

- Do not feel at risk of infection
- Fear of needles
- Cost of vaccination
- There are no convenient vaccination clinics
- Belief that alternative or traditional medicine is preferable
- Misconceptions about vaccine efficacy
- Fear of vaccine adverse events
- Misconception that flu vaccination can cause influenza
- Belief that flu is neither serious nor common

Institutional approaches for improving HCW influenza vaccination rates

- Annual vaccination,
- Administrative support and leadership,
- Targeted education campaigns, provision of vaccine at no cost,
- Easy access to vaccine,
- Declination statements, and
- System-wide surveillance

2005 Society for Healthcare Epidemiology in America (SHEA) position paper
“SHEA views influenza vaccination of HCP as a core patient and HCP safety practice with which noncompliance should not be tolerated.”

2010 Society for Healthcare Epidemiology in America (SHEA) position paper
HCW vaccination rates following implementation of a mandatory influenza vaccination program

HCW vaccination rate (%)

- VMMC
- BJC Healthcare
- CHOP
- HCA
- MedStar Health

- Year prior to mandate
- Year following mandate
- Requiring Unvaccinated HCW to Wear a Mask during the Influenza Season
Summary

- Enough evidence that influenza vaccination must be part of hospitals’ comprehensive infection control programme just like hand hygiene.
- Vaccination must be free and easily accessible
- Mandatory vaccination?
Thank you

Hospital Sungai Buloh