Can we know the immunisation status of healthcare workers?

Results of a feasibility study in hospital trusts, England, 2008 *

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* This project was conducted as an EPIET Fellow at the Health Protection Agency Centre for Infections, London, UK
Introduction

- Health Care Worker (HCW) immunizations are important
  - Patients health
  - Staff health
Recommendation

- In England, the Department of Health recommends to vaccinate HCWs:
  - Against diseases normally included in the routine schedule: MMR and DTAP/IPV
  - Plus seasonal influenza, tuberculosis, hepatitis B, and varicella
Uptake unsatisfactory in HCWs

- **England**
  - 13.4% flu vaccine uptake in HCWs after the 2007/2008 season
  - 7% MMR uptake after two mumps incidents in hospital setting (Williams et al. J Hosp Infect. 2010 Sep;76(1):91-2)
  - Patients exposed to chickenpox by infected healthcare workers (Health Protection Report, August 2008)
  - Measles outbreaks reported outbreaks being reported from nurseries, schools, hospitals – including healthcare staff (Health Protection Report, May 2008)

- **Elsewhere**
  - In Italy, vaccination coverage is high but not yet satisfactory for hepatitis B and is absolutely insufficient for influenza (Prato et al. Expert Rev Vaccines 2010 9(3): 277-283.
  - ......
HIV and Hep B scare hits 1,100

MORE than 1,000 patients could have caught deadly HIV or Hepatitis B from an NHS worker diagnosed with BOTH illnesses.

It is the first time a healthcare employee has been found to have both diseases.
Monitoring vaccine uptake in HCWs

- In England, there is a national surveillance system to measure influenza vaccine uptake in HCWs.

- But what about the other vaccines recommended for HCWs?

- No national surveillance system to measure general vaccine uptake in HCWs.
Objective

- We conducted a survey of all English Acute and Foundation NHS hospital trusts to:
  1. Understand how HCWs immunizations are managed
  2. Determine the feasibility of establishing a national surveillance system for vaccine uptake in HCWs

Methods

- Between January and April 2008
- Questionnaire survey to all 162 NHS Acute and Foundation hospital trusts in England
- 48 questions about staff immunisation policies and data management
- Submitted by email in 2 formats
  - MS Word
  - Online Form www.surveymonkey.com
- Descriptive epidemiology
- Analytical epidemiology
  - We combined influenza vaccine uptake data and responses regarding vaccination policies in place at trust level.

Results

- Respondent Trusts: 104/162 (64%)
- From all across England
- 40% (41/104) Foundation Trusts (i.e. decentralized management system)
- 61% (63/104) Acute Trusts (i.e. Managed directly by the NHS)
- Each trust responsible for 1 to 8 hospitals (median=2)
- Occupational Health (OH) managed by:
  - Own OH Department: 88% (92/104)
  - External (primary care trust or private contractors): 8% (8/104)
  - Did not respond: 4% (4/104)
Screening and vaccination

- Policies for staff immunisations:
  - 82% (85/104): In Place
  - 2% (2/104): Not In Place
  - 16% (17/104): Did not respond

- Hepatitis B Vaccination
  - 88% (91/104): All staff in direct contact with patients blood (i.e. not only staff performing EPPs):
  - 12% (13/104): Did not respond

## Vaccines offered to HCWs

<table>
<thead>
<tr>
<th>Vaccine</th>
<th>No</th>
<th>Yes</th>
<th>Since (median year)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hepatitis B</td>
<td>0</td>
<td>94</td>
<td>1989</td>
</tr>
<tr>
<td>BCG</td>
<td>0</td>
<td>94</td>
<td>1990</td>
</tr>
<tr>
<td>Flu</td>
<td>0</td>
<td>94</td>
<td>1990</td>
</tr>
<tr>
<td>MMR</td>
<td>0</td>
<td>94</td>
<td>2005</td>
</tr>
<tr>
<td>Varicella</td>
<td>1</td>
<td>93</td>
<td>2004</td>
</tr>
<tr>
<td>DTIPV</td>
<td>14</td>
<td>71</td>
<td>2000</td>
</tr>
<tr>
<td>Other</td>
<td>9</td>
<td>48</td>
<td></td>
</tr>
<tr>
<td>Hepatitis A</td>
<td>_</td>
<td>33</td>
<td></td>
</tr>
<tr>
<td>Typhoid</td>
<td>_</td>
<td>19</td>
<td></td>
</tr>
<tr>
<td>Meningitis</td>
<td>_</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td>Anthrax</td>
<td>_</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Yellow Fever</td>
<td>_</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

Numeratorators and denominators

Proportion of trusts holding specific information about immunization of HCW (n=104)

<table>
<thead>
<tr>
<th>Information recorded</th>
<th>Yes (%)</th>
<th>No (%)</th>
<th>Not responded (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>All vaccinations in a central database</td>
<td>71 (68.2)</td>
<td>6 (5.8)</td>
<td>27 (26.0)</td>
</tr>
<tr>
<td>All staff eligible for immunizations in a central database</td>
<td>69 (66.4)</td>
<td>7 (6.7)</td>
<td>28 (27.0)</td>
</tr>
<tr>
<td>Hepatitis B vaccinations</td>
<td>51 (49.0)</td>
<td>38 (36.5)</td>
<td>15 (14.4)</td>
</tr>
<tr>
<td>Staff eligible for hepatitis B vaccine</td>
<td>17 (16.4)</td>
<td>72 (69.2)</td>
<td>15 (14.4)</td>
</tr>
<tr>
<td>Varicella vaccinations</td>
<td>50 (48.1)</td>
<td>39 (37.5)</td>
<td>15 (14.4)</td>
</tr>
<tr>
<td>Staff eligible for varicella vaccine</td>
<td>17 (16.4)</td>
<td>72 (69.2)</td>
<td>15 (14.4)</td>
</tr>
<tr>
<td>MMR vaccinations</td>
<td>48 (46.2)</td>
<td>38 (36.5)</td>
<td>18 (17.3)</td>
</tr>
<tr>
<td>Staff eligible for MMR vaccine</td>
<td>16 (15.4)</td>
<td>73 (70.2)</td>
<td>15 (14.4)</td>
</tr>
<tr>
<td>BCG vaccinations</td>
<td>39 (37.5)</td>
<td>16 (15.4)</td>
<td>49 (47.1)</td>
</tr>
<tr>
<td>Staff eligible for BCG vaccine</td>
<td>17 (16.4)</td>
<td>72 (69.2)</td>
<td>15 (14.4)</td>
</tr>
</tbody>
</table>
Do you know your numbers?

Data available at trust level (n=104)

<table>
<thead>
<tr>
<th>Data</th>
<th>Yes (%)</th>
<th>No (%)</th>
<th>Not responded (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of staff employed</td>
<td>88 (84.6)</td>
<td>2 (1.9)</td>
<td>14 (13.5)</td>
</tr>
<tr>
<td>Number of employees per occupational category</td>
<td>75 (72.1)</td>
<td>15 (14.4)</td>
<td>14 (13.5)</td>
</tr>
<tr>
<td>Number of staff performing exposure-prone procedures</td>
<td>35 (33.6)</td>
<td>54 (51.9)</td>
<td>15 (14.4)</td>
</tr>
<tr>
<td>Number of staff in direct contact with patients’ blood</td>
<td>15 (14.4)</td>
<td>69 (66.4)</td>
<td>20 (19.2)</td>
</tr>
<tr>
<td>Trusts issuing the Smart Card</td>
<td>85 (81.7)</td>
<td>6 (5.8)</td>
<td>13 (12.5)</td>
</tr>
<tr>
<td>Smart card users that store immunization data in a central database via this system</td>
<td>38 (44.7)</td>
<td>—</td>
<td>—</td>
</tr>
</tbody>
</table>

Recording vaccinations

- OH software
  - 76% (79/104) use 9 different software packages to manage staff immunisations
    - 35% Cohort, 21% Opas, 11% Excel, 6% Access...
  - 10% (10/104) do not use any software
  - 14% (14/104) did not respond
- 42% (44/104) would agree to provide data on HCW vaccine coverage
  - 64% by an automated system
  - 48% by paper format
- 72% (75/104) reported flu vaccine uptake for the 2007/2008 season

Analytical Epidemiology

- Trusts reporting influenza vaccine uptake data more likely to respond to the current study (PR 1.72, 95% CI 1.25–2.38, P<0.001).
- Trusts responding to our survey had higher influenza vaccine uptake (mean 15.2, 95% CI 12.9–17.5) compared to non-responders (mean 11.6, 95% CI 8.7–14.4, P=0.04).
- Reporting influenza uptake was more frequent in trusts that had knowledge of the number of staff employed per occupational category (PR 1.4, 95% CI 1.0–2.0, P=0.017).
- Reporting the use of OH software was also associated with knowing the number of staff employed in the trust (PR 4.6, 95% CI 1.7–12.8, P<0.001) and the number of staff employed per occupational category (PR 1.8, 95% CI 1.2–2.6, P<0.001).
Discussion

- Immunisation policies are widely in place in hospital trusts
- Majority keeps information on immunisations in databases
  - Especially on vaccines administered (numerators)
  - But also, although in a lower percentage, on staff members eligible for vaccination (denominators)
- Trusts with “good” systems report higher coverage
  - “For better immunisation coverage, measure coverage better” (Papania & Rodewald Lancet. 2006 Mar 25;367(9515):965-6.)
- However:
  - Considerable variability in the way immunization data is recorded
  - Less than half of hospitals is willing to provide vaccine uptake data to HPA

Possible Limitations

- Although response rate satisfactory, not all questions were answered
- Responders may be the “good” hospitals
  - Possibly leading us to overestimate good practice
- Responding trusts more likely to have responded also to the influenza vaccine
  - There may be a consistent group of trusts that are not keen to respond

It doesn’t apply to me...
Conclusions

- Setting-up a national surveillance system HCWs vaccine uptake is:
  - Possible
  - Technically challenging

- How?
  - By encouraging hospitals to record every time they administer a vaccine or screen for protection
  - By using all potential sources of information to determine staff eligibility for vaccination
  - By designing a surveillance system which integrates with software packages used in hospitals
  - By considering the collection of uptake data in different ways in distinct hospitals
Thank you

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