UK Childhood Live Attenuated Influenza Vaccination Programme

Epidemiological report of pilot programme in England, 2013/14: contribution of RCGP network

Respiratory Diseases Department
CIDSC
Public Health England
Background

In 2012, the Joint Committee on Vaccination and Immunisation (JCVI) recommended the rollout of a universal childhood influenza vaccine programme with a newly licensed live attenuated influenza vaccine. Ultimately it is intended that this programme will target all children 2-16 years of age each season.

This rollout commenced in 2013/14

- All GP practices in England and the rest of the United Kingdom offered influenza immunisation to all registered patients aged two and three years of age as of September 2013
- Seven geographically discrete pilots across England undertook vaccination targeted at all children of primary school age (4-11 years).

The seven geographically discrete pilot regions consisted of Bury, Cumbria, Gateshead, Leicester (Leicester City, East Leicestershire and Rutland), South East Essex and the Havering and Newham boroughs of London. The purpose of the pilots was to evaluate different models of vaccine delivery in a range of populations (particularly school based vs. pharmacy/primary care-based, though the majority of pilots undertook immunisation in primary schools). The pilots provided the opportunity to measure vaccine uptake and to undertake a preliminary assessment of programme impact.

With the rollout of the new LAIV programme for children across England and the Devolved Administrations, existing influenza surveillance systems, including influenza-like illness rates and associated respiratory swabbing reported through the RCGP scheme, have been adapted to be able to report on the potential impact of the programme on a range of disease indicators in targeted and non-targeted groups compared to previous seasons and between pilot and non-pilot areas. Additional participating RCGP sites were recruited in each LAIV 4-11 year old pilot area where required. Initial in-season vaccine uptake and impact observations of the pre-school\(^1\) and primary school age programme\(^2\) have been encouraging and were published earlier in June. Within this report, more detailed end of season observations during 2013/14 are provided.

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Observations

Impact of Childhood Influenza Vaccine Programme

Low levels of influenza activity were seen in primary care in England in 2013/14 (Figure 1), with the 2009 pandemic A(H1N1) virus the dominant circulating strain. Influenza circulation occurred late in the season, with virological activity peaking in March 2014 (Figure 2). As seen previously with this strain after the 2009 pandemic, impact was mainly seen in younger adults, with admissions to hospital and intensive care and peak ICU/HDU numbers higher than seen in the previous season. These low levels of community activity need to be taken into consideration when interpreting any apparent impact (or not) of the childhood vaccination programme.

**Figure 1. Weekly RCGP influenza-like illness consultation rates**

![Weekly RCGP influenza-like illness consultation rates](image)

**Figure 2. Weekly proportion of RCGP/SMN samples positive for influenza**

![Weekly proportion of RCGP/SMN samples positive for influenza](image)

2-3yrs

Through the RCGP scheme, ILI consultation rates in 2-3 year olds reached a peak of 13.8 per 100,000 in weeks 49 and 50 2013 and 14.1 per 100,000 in week 6 2014 (Figure 3). This has resulted in a cumulative ILI incidence of 127.1 per 100,000 in this age group during the 2013/14 season. This is compared to 119.9 per 100,000 in 2012/13 and 92.9 per 100,000 in 2013/14.
Insufficient samples through the GP swabbing schemes were received to assess positivity in the 2-3 year old age group.

4-11yrs

Lower ILI consultation rates were seen in pilot compared to non-pilot areas in 2013/14 (Figure 4). While similar numbers were seen in 4-11 year olds, a low denominator in the pilot areas meant that even though no more than one episode was reported each week, it resulted in comparatively high rates. When comparing ILI activity in 4-11 year olds to previous years, activity has previously been reported in pilot sites in this age group when A(H1N1)pdm09 was circulating (Figure 5).

Figure 3. Rate of ILI consultations through the RCGP scheme in 2-3 year olds 2008 – 2014

Figure 4. Cumulative ILI consultations in GP sentinel surveillance scheme in pilot vs non-pilot areas by age-group, 2013-14
From week 40 to week 20, through the RCGP sentinel swabbing scheme, 16/207 (7.7%) respiratory swabs from all age groups have tested positive for influenza in the pilot areas (14 A(H1N1)pdm09 and two A(H3), Table 1). In the non-pilot areas, by week 20, 264/1,640 (16.1%) tested positive for influenza (187 A(H1N1)pdm09, 65 A(H3), and 12 B). When assessing across age groups, cumulative positivity was consistently lower in pilot compared to non-pilot areas in both targeted and non-targeted age-groups (Figure 6).

Table 1. Cumulative number of samples tested and positive for influenza in pilot and non-pilot areas, week 40 to 20 2013/14

<table>
<thead>
<tr>
<th>Age group</th>
<th>Influenza Virus</th>
<th>Pilot</th>
<th>Non-pilot</th>
<th>( \chi^2 ) p value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Influenza Virus</td>
<td>Number of samples</td>
<td>% influenza positive</td>
<td>Number of samples</td>
</tr>
<tr>
<td>&lt;4yrs</td>
<td>All</td>
<td>0</td>
<td>10</td>
<td>0.0</td>
</tr>
<tr>
<td>4-11yrs</td>
<td></td>
<td>2</td>
<td>24</td>
<td>8.3</td>
</tr>
<tr>
<td>12+yrs</td>
<td></td>
<td>14</td>
<td>173</td>
<td>8.1</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>16</td>
<td>207</td>
<td>7.7</td>
</tr>
<tr>
<td></td>
<td>A(H1N1)pdm09</td>
<td>14</td>
<td>173</td>
<td>8.1</td>
</tr>
<tr>
<td></td>
<td>A(H3)</td>
<td>2</td>
<td>10</td>
<td>1.0</td>
</tr>
<tr>
<td></td>
<td>B</td>
<td>0</td>
<td>0</td>
<td>0.0</td>
</tr>
</tbody>
</table>

Figure 5. Rate of ILI consultations through the RCGP scheme in 4-11 year olds in pilot and non-pilot areas 2008 – 2014

Figure 6. Cumulative proportion of samples positive for influenza in GP sentinel swabbing schemes in pilot vs non-pilot areas by age-group, 2013/14
Overall impact
Relative risks and odds ratios were calculated when comparing all-age cumulative pilot/non-pilot rates and proportions respectively as previously described (Table 2)\(^3\). The odds ratio for cumulative flu swab positivity were significantly lower in pilot compared to non-pilot areas, with an overall estimated programme impact of 52%. For cumulative ILI consultation rates, the relative risk estimate was borderline significant, with an impact of 49% in pilot compared to non-pilot areas.

Table 2. Cumulative all-age, primary care consultations and influenza positivity, in pilot and non-pilot areas, England, 2013/14 influenza season

<table>
<thead>
<tr>
<th>Disease indicator</th>
<th>Pilot</th>
<th>Non-pilot area</th>
<th>Ratio (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ILI GP consultations</td>
<td>117/100 000</td>
<td>222/100 000</td>
<td>0.59</td>
</tr>
<tr>
<td></td>
<td>(105/89,671)</td>
<td>(1,809/815,430)</td>
<td>(0.33 – 1.06)</td>
</tr>
<tr>
<td>ILI swab positivity</td>
<td>9.00%</td>
<td>17.10%</td>
<td>0.48</td>
</tr>
<tr>
<td></td>
<td>(15/167)</td>
<td>(222/1,301)</td>
<td>(0.25 – 0.93)</td>
</tr>
</tbody>
</table>

Conclusions

- 2013/14 saw the successful initiation of the new childhood universal influenza vaccination programme in England including vaccination of primary school age children in a series of geographical pilots.
- The RCGP ILI consultation rate reporting scheme was successfully adapted to monitor influenza activity by pilot/non-pilot area and targeted/non-targeted age groups to allow a measure of impact of the childhood programme.
- Community influenza activity was low in 2013/14 making it difficult to assess programme impact in this season alone. However, these surveillance systems including RCGP are now established for use in future seasons to accrue sufficient historical data to inform a future detailed evaluation of this new vaccine programme.
- Despite low activity, disease incidence was on average lower in pilot relative to non-pilot areas in both vaccinated cohorts and non-targeted groups, showing promising indications of direct and indirect impact.
- Ongoing surveillance is planned as the programme is further rolled out in 2014/15 to additional age groups and geographical areas. Further work and observations from future seasons using the RCGP network will be critical to evaluate this programme, particularly in 2014/15 when both primary and secondary school-aged children will be targeted in different pilots. Ensuring on-going high quality reporting and swabbing will be critical.

\(^3\)http://www.eurosurveillance.org/ViewArticle.aspx?ArticleId=20823
Acknowledgements

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