

## Appendix A

Summary of new evidence from 8-year surveillance	Summary of new intelligence from 8-year surveillance (from topic experts or initial internal intelligence gathering)	Impact
<p><b>PH21 – 01. Recommendation 1 - immunisation programmes</b></p>		
<p><b>New evidence was identified that does not have an impact on the recommendation.</b></p> <p>An online survey<sup>2</sup> considered whether discussing the benefits of MMR vaccination either to the recipient or to society impacts parents' vaccine intentions. The study looked at 802 parents of infants under 12 months old who were randomly assigned to receive MMR vaccine messages. There were four types of messages. 1) A Vaccine Information Statement (VIS) 2) VIS plus information on benefits to child 3) VIS and information on benefits to society 4) VIS and information on benefits to both child and society. It was found that showing benefits to society did not increase intention to uptake, unless it also mentioned benefits to the child. Messages that gave the benefits to the child gave a mean intention of 91.6 p=0.01 and to child and society was 90.8 p=0.03 compared to the VIS only group (mean intention = 86.3).</p> <p>In an RCT where 660 children<sup>3</sup> were randomly assigned to either "educational" text messages involving information about the need for a second dose, "conventional" text messages involving second due date and clinic opening hours, and "written reminder-only" arms, those who received educational messages were more likely to receive a second dose (72.7%)</p>	<p>On publication of <a href="#">Flu vaccination: increasing uptake</a> the guideline should be reconsidered to see if any amendments need to be made.</p> <p>No other evidence identified</p>	<p>None. This recommendation looks at immunisation programmes across different settings and recommends tailored information, invitations, reminders and recalls. The evidence found during the surveillance review confirmed our recommendation content.</p>

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<p>compared to conventional (66.7%) and written reminder only (57.1% P=0.003).</p> <p>Focused groups<sup>4</sup> with 41 members of the general population noted that factual, evidence based messages were well received. Health enhancing messages were not well received, the same with messages that aimed to encourage feelings of regret for not getting vaccinated. Risk-reduction messages were seen as credible.</p> <p>In a cluster randomised controlled trial<sup>5</sup> 22,486 girls were assigned to receive a 3 part clinician focused intervention (family focused, clinician focused and combined compared to none). The details of the intervention are unclear. The combined intervention increased and accelerated vaccination rates. The clinician focused intervention improved HPV initiation and the family focused intervention improved completion. Unfortunately no statistics were provided and no further details were given.</p> <p>One systematic review<sup>6</sup> of 22 studies of HPV vaccination educational interventions showed that there was no strong evidence to recommend specific educational interventions.</p> <p>A web questionnaire<sup>7</sup> filled out by 133 local health authorities in Italy noted that 70% coverage was more likely to be reached if invitation letters for HPV vaccinations gave a</p>		

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<p>pre-assigned date (95% CI 1.2-39.8). Factors that were seen as barriers to vaccination were poor participation at training, population mistrust of the vaccination and insufficient resources.</p> <p>In a randomised intervention study<sup>8</sup> of 77 parents, the participants either received tailored or untailored educational web pages. Information tailored to address specific concerns gave 58% positive vaccine intentions and the untailored gave 46%. These results were not statistically significant though.</p> <p>A randomised controlled trial<sup>9</sup> of 811 infants who received reminder postcards to encourage vaccination, and if these failed they were followed by telephone reminders plus postcards and a telephone recall messages, and if these continued to fail to encourage vaccination they received intensive case management and home visitation, showed that infants who received these interventions had significantly fewer days without immunisation coverage compared to those who received care as usual (109 vs 192 days P=0.01).</p> <p>A randomised controlled trial<sup>10</sup> of 2054 parents of children received either a scheduling appointment plus text message reminders, appointment reminders only or usual care. Those in the scheduling plus appointment text message arm were more likely to arrange a visit for MMR than the other arms (RRR 1.07 95% CI</p>		

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<p>1.005-1.13). They were also more likely to have a timely MMR vaccination (RRR 1.11 95% CI 1.01-1.21).</p> <p>A systematic review<sup>11</sup> to look at barriers to uptake of HPV vaccine in the US found 55 relevant articles. Health care professionals noted financial concerns and parental attitudes as barriers. Parents noted they would like more information prior to vaccination. There were concerns around the side effects following vaccination, it was noted that there was a low perceived risk of HPV infection, social influences and irregular preventive care were noted as barriers. Sons were not vaccinated due to a perceived lack of direct benefit.</p> <p>A cluster randomised trial<sup>12</sup> of 195 practices in Colorado looked at population based recall compared to practice based recall. In population recall 18.7% of infants became up to date in vaccinations compared to 12.8% in practice based. It was noted that population based recall was more effective and cost effective.</p> <p>A randomised pragmatic trial<sup>13</sup> of primary care practices involving 18,235 children in Colorado looked at the effectiveness and cost effectiveness of collaborative centralised vs practice based reminder/recall approaches. Infants who received at least 1 vaccination were 26.9% for collaborative centralised vs 21.7% for</p>		

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<p>practice based approaches (P=0.001). In the collaborative centralised approach 12.8% of patients achieved up to date status compared to 9.3% in the practice based approach (P=0.001).</p> <p>In another cluster randomised trial<sup>14</sup> in Colorado counties centralised reminder/recall approaches were more effective and cost effective than practice-based reminder/recall approaches when it came to increased up to date rates in young children. Centralised reminder recall approaches were more effective if the child's name was included.</p> <p>A randomised controlled trial<sup>15</sup> evaluated the impact of a web based personally controlled health management system to acknowledge the impact on uptake of seasonal influenza vaccine. 742 students either received no care or were introduced to the system. Users of the system were 6.7% (95% CI 1.46-12.30) more likely to receive the vaccination than the control group. It was noted that the more a patient used the system the higher the rate of vaccination became (P=0.001).</p> <p>A cluster randomised trial<sup>16</sup> of 20 primary care practices were either randomly assigned to using a practice improvement toolkit, early delivery of vaccines, in-service staff meetings and publicity compared to standard care. Overall there was a 9.9% increase in vaccination uptake in the intervention group</p>		

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<p>compared to 4.2% in the control.</p> <p>Parallel randomised controlled trials<sup>17</sup> looked at 178 phone interventions and 191 text interventions compared to 380 controls. Those who received a text reminder increased uptake rates (HR = 2.34 p&lt;0.001) compared to the controls.</p> <p>In a randomised controlled trial<sup>18</sup> 264 students were assigned to receive an electronic intervention reminder and educational message compared to standard care in order to increase HPV vaccine completion and knowledge. There were no significant differences in uptake but there was a difference in the mean knowledge score in the intervention group compared to the control group (P=0.1).</p> <p>A randomised controlled trail<sup>19</sup> assigned 445 parents to either a rhetorical question, a one sided message with information about safety and efficacy of HPV vaccinations or a two sided message acknowledging and alleviating concerns. The rhetorical question intervention increased intention to vaccinate (RR = 1.45 95% CI 1.16-1.81) but did not increase uptake or completion.</p> <p>In one study 195<sup>20</sup> parents of children who needed immunisations received text message reminders and in another study<sup>20</sup> 87 parents received text message and paper mailed</p>		

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<p>reminders compared to no text messages. The children from intervention parents were more likely to receive their vaccinations in both studies (36.4% vs 18.1% P=0.001 at 24 weeks) and (21.8% vs 9.2% P=0.05) retrospectively.</p> <p>A randomised controlled trial<sup>21</sup> of 9213 children's parents received 5 weekly text messages containing educational information and instructions about vaccination availability times. The intervention group were more likely to receive the influenza vaccine (27.1%) compared to the usual care group (22.8%), a difference of 4.3% 95% CI 2.3%-6.3%.</p> <p>A randomised controlled trial<sup>22</sup> where 4115 participants received a mailed letter, a telephone reminder or nothing at all. Vaccine uptake rates increased for the mailed letter group by 21% (P=0.01 vs control), 17% for the telephone reminder (P=0.05) and 13% for the control group.</p> <p>A randomised controlled trial<sup>23</sup> looking at the impact of electronic health records prompts or staff initiated provider prompts on immunisation rates. There were no significant differences between the groups.</p> <p>A systematic review<sup>24</sup> of 46 studies showed that facilitators of vaccine uptake were: parental reminders; all methods of reminder and recall; educational programmes; and feedback</p>		

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<p>programmes.</p> <p>A cluster randomised trial<sup>25</sup> involving 369 parents of which 55 received the intervention of written and visual information on vaccinations. There was no significant difference between uptake however parents in the intervention group were shown to improve their attitudes about childhood vaccines.</p> <p>A call/recall system<sup>26</sup> was used in 32 practices and was viewed positively by parents and staff. After 3 invitations 87.3% of children had responded to the MMR1 vaccination and 92.2% had responded to the pre-school booster.</p> <p>A cross sectional online questionnaire<sup>27</sup> across 795 general practices in England showed the following facilitators for influenza vaccinations: having a lead staff member plan the campaign; sending a personal invitation to eligible patients; and having a lead member of staff to identify eligible patients.</p> <p>Out of 259 girls who had not been vaccinated and who completed a survey<sup>28</sup>, the main barriers for vaccination were lack of perceived need; concerns about safety and lack of parental consent (this was more prevalent from girls with Black backgrounds).</p> <p>In a systematic review<sup>29</sup> of qualitative studies 34 papers were included. It was shown that</p>		

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emotions affected decision making in regard to vaccination decisions and it was important for stakeholders to have trust in the information they received.		
<b>PH21 – 02. Recommendation 2 - information systems</b>		
No evidence identified	No evidence identified	None
<b>PH21 – 03. Recommendation 3 - training</b>		
No evidence identified	No evidence identified	None
<b>PH21 – 04. Recommendation 4 - contribution of nurseries, schools, colleges of further education</b>		
<p><b>New evidence was identified that does not have an impact on the recommendation.</b></p> <p>A systematic review<sup>30</sup> of 59 studies of school located vaccinations looked at how incentives, education, design of consent form and follow up can increase parental consent for vaccinations and number of returned forms. Minimising out-of-pocket cost; offering both the intramuscular and intranasal vaccination and using reminders increases vaccination rates. Organisation, communication and planning can help. The study showed that school based programmes are effective however it is not clear what these were being compared to.</p> <p>A cross-sectional survey<sup>31</sup> of vaccine systems in 22 welsh local authorities showed that school</p>	<p>One expert noted that in regard to teenage vaccines there “needs to be more written about school age vaccinations and the role of the school nurse”. The expert gave no other advice or suggestions.</p> <p>On publication of <a href="#">Flu vaccination: increasing uptake</a> the guideline should be reconsidered to see if any amendments need to be made.</p> <p>No other evidence identified</p>	<p>This recommendation looks at the contribution of nurseries, schools and colleges of further education, however it does not consider higher education facilities. There was no evidence found in regard to this setting and therefore it is suggested that this be reconsidered during any future update of the guideline.</p>

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<p>settings delivered higher uptakes.</p> <p>A cluster-randomised trial<sup>32</sup> involved 44 elementary schools serving 19776 children. Parents of schools that were offering influenza vaccination were sent information and consent forms via email or flyers. Children in schools that offered vaccinations had higher update rates county wide (54.1% vs 47.4% p=0.001).</p>		
<p><b>PH21 – 05. Recommendation 5 - targeting groups at risk of not being fully immunised</b></p>		
<p><b>New evidence was identified that does not have an impact on the recommendation.</b></p> <p>A three phase qualitative study<sup>33</sup> involved interviews with 174 travellers and gypsies from 6 communities, interviews with 39 service providers and workshops involving 51 travellers and gypsies and 25 service providers. Barriers were language, culture, literacy, poor school attendance, poverty, booking appointments, lack of attendance and housing. Trust and continuity of care was important. Interventions discussed were 1) cultural competence training for staff 2) identification of Travellers and gypsies in health records 3) having a named person to provide respectful and supportive service 4) flexible systems for booking appointments 5) protected funding for health visitors specialising in traveller and gypsy health.</p>	<p>One of our experts noted queried that “the guidance talks about the vulnerable and groups at risk of not being immunised and recommends that in these groups more effort is required (language translation, home visit, reminders etc) and it mentions doing a health equity audit - I just wondered if it is possible here to talk about capacity as in some areas of deprivation a lot more time, money and effort may be required to achieve good uptake?”</p> <p>On publication of <a href="#">Flu vaccination: increasing uptake</a> this guideline should be reconsidered to see if any amendments need to be made.</p> <p>No other evidence identified</p>	<p>None. This recommendation looks at targeting groups at risk of not being fully immunised and considers those with transport, language or communication difficulties as well as those with physical or learning disabilities. It focuses on new migrants, asylum seekers, young offenders and looked after children. Although there is emerging evidence around travellers and gypsies as an ‘at risk’ group it is felt this does not warrant an update at this current time.</p>

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<b>PH21 – 06. Recommendation 6 - hepatitis B immunisation for infants</b>		
No evidence identified	<p><b>New evidence was identified that does have an impact on the recommendation.</b></p> <p>It has been noted that from August 2017 the hepatitis vaccine will be incorporated into the infant hexavalent.</p>	<p>This recommendation should be amended as it is no longer fully necessary for the guideline population.</p> <p>The following statements should be removed from the recommendation</p> <ul style="list-style-type: none"> <li>• PCTs should have an identified person responsible for coordinating the local hepatitis B vaccination programme for babies at risk of hepatitis B infection. The person should also be responsible for scheduling and follow-up to ensure babies at risk are vaccinated at the right time. This may involve working within and across several PCT areas.</li> <li>• A clear process for the local infant hepatitis B vaccination programme should be developed and implemented. Antenatal, postnatal, neonatal, paediatric, primary care and community support teams should communicate effectively and share information so that the children and families affected can be contacted and followed up.</li> <li>• Health professionals should ensure administered doses of hepatitis B vaccination are recorded in the patient records and the personal child health record.</li> </ul>

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<b>Research recommendations</b>		
<b>What are the most effective and cost effective ways of increasing immunisation uptake among looked after children and young people and other population groups at risk of being only partially immunised or not immunised at all?</b>		
No evidence identified	On publication of <a href="#">Flu vaccination: increasing uptake</a> the guideline should be reconsidered to see if any amendments need to be made.  No other evidence identified	None
<b>What are the most effective and cost effective ways of modifying services to increase vaccine uptake among children and young people, particularly those at risk of not being immunised, or of being only partially immunised? Does this vary by population subgroups? Examples might include home visits, changes in information provision and the introduction of opportunities to discuss immunisation before vaccines are given.</b>		
<p><b>New evidence was identified that does not have an impact on the recommendation.</b></p> <p>A systematic review<sup>30</sup> of 59 studies looking at school based vaccinations noted that offering both the intramuscular and intranasal vaccinations increased vaccination uptake, however no data was given to back up this statement.</p>	<p>On publication of <a href="#">Flu vaccination: increasing uptake</a> the guideline should be reconsidered to see if any amendments need to be made.</p> <p>No other evidence identified</p>	None. Although there was a systematic review looking at school based vaccinations, there was not enough data provided around vaccination delivery to warrant amending the recommendation.
<b>What are the most effective and cost effective ways of providing parents of children and young people with information to encourage timely immunisation? Specifically, what are the most effective and cost effective ways of providing information to reach those who are particularly at risk of not being immunised or only partially immunised?</b>		
None	On publication of <a href="#">Flu vaccination: increasing uptake</a> the guideline should be	None

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	<p>reconsidered to see if any amendments need to be made.</p> <p>No other evidence identified</p>	
<p><b>RR – 04 How effective – and how acceptable to the public – are quasi-mandatory and incentive schemes for immunisation? (Examples of the former are schemes linked to nursery or school entry.) What impact do such schemes have on the timely uptake of vaccinations?</b></p>		
<p><b>New evidence was identified that does not have an impact on the recommendation.</b></p> <p>A randomised controlled trial<sup>34</sup> to assess the impact of financial incentives on uptake and completion of HPV vaccinations looked at 1,000 16-18 year old girls who randomly received either a standard invitation letter or an invitation letter containing the offer of vouchers worth £45 for undergoing the 3 vaccinations. The intervention arm increased uptake of the first vaccination (OR 1.63 95% CI 1.08-2.47) and the third vaccination (OR 2.15 95% CI 1.32-3.5).</p> <p>Also 521 parents and carers of preschool children were involved in a survey<sup>35</sup> alongside health and educational professionals. Those involved took part in focus groups and individual interviews and online questionnaires. This study showed that parental financial incentives were not popular. The systematic review showed insufficient evidence that interventions that offer rewards or penalties for vaccinations were effective. Quasi-mandatory interventions were acceptable. No evidence could be found</p>	<p>On publication of <a href="#">Flu vaccination: increasing uptake</a> this guideline should be reconsidered to see if any amendments need to be made.</p> <p>No other evidence identified</p>	<p>None. There is not enough evidence to suggest that quasi-mandatory and incentive schemes are effective for immunisation uptake.</p>

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<p>on costs and consequences.</p> <p>A qualitative study<sup>36</sup> involved 91 parents and carers of preschool children, 18 health and other professionals and 6 people responsible for developing and commissioning services to understand if financial incentives or quasi-mandatory schemes might be acceptable in increasing vaccination uptake. In terms of financial incentive, parents and professions felt this was inappropriate. Quasi-mandatory schemes were more positively received stating it felt natural, fair and less likely to create inequality. There were concerns around its implementation and workability though.</p> <p>A systematic review<sup>37</sup> to look at acceptability of financial incentives and quasi-mandatory policies in regard to increasing vaccination uptake. There was insufficient evidence to state whether interventions such as these are effective.</p>		
<p><b>RR – 05 Does giving incentives to immunisation providers increase immunisation rates in the UK? For example, how does community target setting, or changes in targets or payment systems, affect immunisation coverage?</b></p>		

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No evidence identified	<p>On publication of <a href="#">Flu vaccination: increasing uptake</a> this guideline should be reconsidered to see if any amendments need to be made.</p> <p>No other evidence identified</p>	None
<b>Gaps in the evidence</b>		
<p><b>- There is a lack of UK evidence on the effectiveness and cost-effectiveness of different interventions aimed at increasing immunisation uptake among children and young people aged under 19 years, particularly among those who may not have been immunised or only partially immunised.</b></p>		
No evidence identified through the surveillance review.	None identified.	None
<p><b>There is a lack of UK evidence on the differential effect of universal interventions to increase immunisation uptake across different groups.</b></p>		
No evidence identified through the surveillance review.	None identified.	None
<p><b>There is a lack of UK evidence on the effectiveness and cost-effectiveness of interventions aimed at increasing uptake of the school leavers' booster vaccination.</b></p>		
No evidence identified through the surveillance review.	None identified.	None
<p><b>There is a lack of UK evidence to determine whether removal of the barriers to accessing immunisation services increases immunisation uptake among children and young people aged under 19 years. Information is particularly lacking in relation to population subgroups at increased risk of not being immunised or only being</b></p>		

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<b>partially immunised.</b>		
No evidence identified through the surveillance review.	None identified.	None
<b>There is a lack of UK evidence to judge whether or not interventions to increase uptake of immunisations in children and young people aged under 19 have any unintended or negative effects. For example, on how repeat reminders to those who do not want their child immunised may affect their relationship with the GP.</b>		
No evidence identified through the surveillance review.	None identified.	None
<b>There is a lack of evidence on the differential effect of using different professionals (such as nurses, GPs and other practitioners) to increase immunisation uptake among children and young people aged under 19 years. In particular, there is a lack of evidence on how this affects subgroups at increased risk of not being immunised or only being partially immunised.</b>		
No evidence identified through the surveillance review.	None identified.	None

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