

Increasing childhood flu vaccination in Greater Manchester

Scoping report

October 2017

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I. Executive Summary

Behavioural Insight Team: North (BIT: North) has a two year partnership with the Greater Manchester Combined Authority (GMCA) and the Greater Manchester Health and Social Care Partnership (GMHSCP). Through this partnership, BIT: North is exploring how behavioural insights could be used to improve public services across Greater Manchester.

This scoping report was produced as part of this partnership and sets out how behavioural insights could be used to increase uptake rates of the influenza vaccination amongst 2, 3 and 4-year-olds in GM. Evidence shows that vaccinating children against flu is highly cost effective if vaccination rates hit the 'herd immunity' threshold of 50% uptake. Currently, uptake (both nationally and in GM) lags below this rate, ranging from 32-42% for 2,3 and 4 year olds.

The report draws on three strands of research:

- ◆ Fieldwork findings from interviewing practice managers and practice nurses from 5 GP practices across GM in August 2017
- ◆ Interviews with 4 parents of young children identified through BITs existing networks
- ◆ An academic literature review exploring the available evidence on increasing uptake of vaccination in general and of the flu vaccination in particular

Fieldwork findings

We conducted fieldwork interviews with staff from 5 GP practices (4 in GM, one sourced from outside GM through BIT's existing networks). The key themes that emerged were:

- ◆ All practices had a lead member of staff coordinating the flu immunisation programme, sent basic invitation letters (which were different in each practice) and encouraged staff to opportunistically immunised patients where possible.
- ◆ Staff thought many parents held false beliefs about the efficacy of the vaccine. A small number of conversations with concerned parents may be particularly memorable for staff, causing them to overestimate active opposition to the vaccine.
- ◆ Most interviewees overestimated their performance last year. This could be because performance on the childhood flu vaccination (rather than the larger, and higher uptake, cohort of older people) gets lost in more general performance feedback.

In addition, we spoke to 4 parents opportunistically identified through BIT's existing networks (two from GM and two from other parts of the country). The key themes that emerged were:

- ◆ Parents had a poor memory of the immunisations their children had received; relying on reminders, prompts and the 'red book'. When asked about the immunisations their children had received, none listed the flu vaccination unprompted.

- ◆ Some parents remembered being invited to a vaccination appointment, but others only remembered seeing generic information (e.g. posters in the GP surgery).
- ◆ Parents felt that providing more practical information on the logistics of the vaccination (i.e. who, when and where) would improve uptake. They also felt that highlighting the potential consequences of not getting the vaccination (for parents, children or other vulnerable people) could be effective.

Literature review

Our literature review highlights a few key barriers to increase uptake of the vaccination. Many of these aligned with findings from our fieldwork review, including perceptions about the importance, effectiveness or potential side-effects of the vaccination and the level of proactive effort taken by GPs to promote immunisation.

The review then identifies how behavioural insights could be used to improve uptake of the vaccination, using BIT EAST framework (if you want to encourage a behaviour, make it Easy, Attractive, Social and Timely) to organise these findings. Some key findings were:

- ◆ Consider offering parents default appointment times they need to opt-out of
- ◆ Re-frame parental inaction or indecision as an active choice not to vaccinate
- ◆ Use loss-framing with anticipated regret to highlight the potential consequences of not having a child vaccinated
- ◆ Provide relative performance feedback to GPs about how their uptake rate compares to other practices in their area
- ◆ Harness parents' prosocial motivations by highlighting the potential costs to other people (e.g. older people) of not vaccinating young children
- ◆ Highlight the deadline for vaccinations (i.e. December) to motivate parents to act

Testing ways to improve childhood flu immunisation

We believe there are three potential options for a behavioural insights trial which could rigorously test changes to vaccination uptake.

Option 1 – Nudging parents

This trial would test changes to invitation or reminder letters sent to parents about the childhood flu vaccination. These changes would incorporate behavioural insights identified during our fieldwork and literature review (e.g. using active choice framing). We suggest using a Randomised Controlled Trial (RCT), in which parents are randomly allocated to receive one of several invitation or reminder letters (or to receive nothing). This could be done either by collaborating with GP practices and coordinating their communications, or by sending out an additional reminder to parents across an area which is on top of any existing GP practice.

The major challenge in delivering this trial is that we need to either a) coordinate a trial across 10-15 GP practices and overcome logistical and data sharing barriers, or b) find a way of identifying which children have had the vaccine at a borough-wide or GM-wide level.

Option 2 – Nudging GPs

In this trial, we would test the impact of a one-off communication to GP practices, incorporating behavioural insights designed to encourage them to do more to increase uptake (e.g. by giving them simple and salient information on their performance). This could be evaluated using a cluster RCT, with practices themselves being randomly allocated to either receive this one-off communication or not.

Option 3 – Wider systemic changes to the way the programme is delivered

This option is beyond the original scope of this report. However, we believe there are two changes GMHSCP could test which go beyond light-touch changes to communications, but which could have a large effect on uptake. These are moving to default, opt-out appointments (as is often the case for other routine childhood immunisations) or opportunistically vaccinating children in places outside GP surgeries (e.g. children's centres or nurseries).

Conclusion

On the basis of our research, we believe that behavioural insights could be used to improve uptake of the childhood flu vaccination. Unfortunately, we do not think it is likely that a project will be possible during the 2017/18 flu season due to challenges in identifying suitable sources of data on uptake, finding organisations willing to print and distribute additional reminder letters and other logistical challenges. This means that we do not recommend that the GMHSCP proceed with a trial. We have not made this recommendation lightly, but we believe the risk that projects could not be delivered in time is too high.

However, we would welcome any further conversations with the GMHSCP about the contents of this report, or how the Partnership can act on our findings. In particular, we are happy to discuss further how any of our findings could be fed into any existing or planned activity for the 2017/18 flu season. We would also welcome a discussion about testing one or more of the interventions identified in this report during the 2018/19 flu season.

II. Background

Behavioural Insight Team: North (BIT: North) has a two year partnership with the Greater Manchester Combined Authority (GMCA) and the Greater Manchester Health and Social Care Partnership (GMHSCP) to explore how behavioural insights could be used to improve public services across the city region. This scoping report was produced as part of this partnership and sets out how behavioural insights could be used to increase uptake rates of the influenza vaccination amongst 2, 3 and 4-year-olds in Greater Manchester.

The report brings together three types of research:

- ◆ An academic literature review exploring the available evidence on increasing uptake of vaccination in general and of the flu vaccination in particular
- ◆ Fieldwork findings from interviewing practice managers and practice nurses from 5 GP practices across GM in August 2017
- ◆ Interviews with 4 parents of young children identified through BITs existing networks

The importance of childhood flu vaccination

Vaccinating children is a low-cost and effective way to save lives and reduce burdens on the healthcare system. In 2012, the British Joint Committee on Vaccination and Immunisation (JCVI) recommended the extension of the influenza vaccination programme to include children aged 2 to 16.¹ Before the extension, annual flu vaccination was only recommended for people aged 65 years and over, and people in the defined influenza clinical risk groups (e.g. pregnant women).² There were two main aims of extending the vaccination programme to include children: to directly reduce the number of children who suffer from complications of flu and to indirectly reduce mortality among adults who contract flu from children.

Evidence shows that vaccinating 2- to 18-year-olds against flu is highly cost effective. The programme has been estimated to cost £251 per QALY (quality-adjusted life year, a standardised measure of the cost of healthcare) relative to current practice.³ According to The National Institute for Health and Care Excellence (NICE), who assess the efficacy and cost effectiveness of treatments available on the NHS, an intervention costing less than £20,000 per QALY is cost effective.⁴ A recent study has also found that vaccinating children against flu protects low-risk elderly people at least as much as, if not more than, vaccinating elderly people themselves.⁵

These positive effects are predicated on achieving the 'herd immunity' threshold of 50% uptake (herd immunity is the share of population who need to be vaccinated to provide immunity for those not vaccinated). For the flu vaccine, the national uptake in 2016/17 was 38.9% for two-year-olds, 41.5% for three-year-olds and 33.9% for four-year olds.⁶ While these figures represents an increase of 3.5-4 percentage points compared to previous year, the uptake is still falling short of the herd immunity threshold.

Uptake rates in Greater Manchester

According to 2016/17 statistics on the flu immunisation programme (see Table 1 – Percentage of children aged 2 to 4 and 5–6 (school year 1) in GM immunised against influenza, 2016–17 (Source: Public Health England) the uptake rate in GM was 39.2% amongst 2-year-olds, 42.3% amongst 3-year-olds and 32.3% amongst 4-year-olds. This means that uptake rates across GM are broadly in line with national and North West averages for all three age groups (with the exception of Trafford which has a much higher uptake rate). For older children, there is generally a higher uptake rate. This seems to be due to the use of school-based delivery models (evidence from previous immunisation programmes suggests that school-based models outperform GP based models for children of the same age).

There are good reasons, from the point of view of behavioural science, why you would expect uptake rates to be lower for a GP-based delivery model. In a GP-based model parents need to call up to book an appointment (or to find out when drop-in sessions are being held). They may only receive a single call or letter specifically prompting them to do this. They then need to remember to physically take their child to the surgery at this time, and rearrange any other commitments they have at the same time.

Table 1 – Percentage of children aged 2 to 4 and 5–6 (school year 1) in GM immunised against influenza, 2016–17 (Source: Public Health England ^{7 8})

	2-year-olds	3-year-olds	4-year-olds	School Year 1 (age 5–6 years)
Bolton	30.3	34.4	24.7	44.5
Bury	42.1	45.5	35.0	58.2
Manchester	33.5	36.8	25.7	39.6
Oldham	35.5	37.8	29.2	42.9
Rochdale	38.5	45.2	32.3	57.7
Salford	35.1	35.1	29.8	44.5
Stockport	56.0	56.2	45.1	65.8
Tameside	37.8	44.2	27.7	56.6
Trafford	54.2	53.8	47.1	59.9
Wigan	43.5	44.7	36.0	65.1

Greater Manchester	39.7	42.3	32.3	51.9
England	38.9	41.5	33.9	57.6

In contrast the logistical difficulties for parents (the so-called 'friction costs') are much lower for parents in the school-based delivery model. Provided parents sign and return a consent form everything is handled for them. There is also less opportunity for a gap between intention and action to emerge (where a parent might intend to get their child to get vaccinated but not get round to doing so).

As Table 1 – Percentage of children aged 2 to 4 and 5–6 (school year 1) in GM immunised against influenza, 2016–17 (Source: Public Health England)above shows, there is a considerable difference in the vaccination rates between the children who are not yet at school age and those who are (though the dip in performance at age 4 is an interesting, and surprising, break in this otherwise consistent pattern). Since this difference is consistent nationally, regionally and across GM boroughs, it suggests that there are more barriers for vaccination uptake in 2- and 3-year-olds than school-aged children.

National requirements for GP practices

The NHS service specification for flu immunisation requires GPs to try to provide the influenza vaccination to all eligible patients.⁹ For early years vaccinations, eligible patients are those registered at the practice and aged two and three on 31 August 2017 (i.e. they may be aged four by the time the vaccine is given). The specification also says that patients should be vaccinated on a *proactive call* basis if not considered at risk, and a *proactive call and recall* basis, if considered at risk. This means that GP practices are not required to contact parents multiple times to remind them to take up the vaccination unless the child is in a clinical risk group.

Practices need to provide data on immunisation to the NHS by manually entering it into a dedicated system (ImmForm). The information they need to provide covers the number of eligible patients they have at each age group (2, 3 and 4 years old) and how many vaccinations they have given. GP practices participating in the NHS's Enhanced Service framework receive a service payment of £9.80 per dose to eligible patients.

Public Health England guidance also discusses how parents should be encouraged to get their children immunised.¹⁰ GPs are encouraged to make as many contacts as possible, unless they get a clear refusal. Besides, for example, discussing staff responsibilities and the process of ordering vaccines, the guidance also sets out specific recommendations to improve the efficiency of inviting and contacting parents:

- ◆ "Send a personalised invitation to eligible children – use the parent's and child's names, sign your name at the bottom.

- ◆ *Phone calls can be more effective than letters; try text messages for reminders*
- ◆ *Ensure that staff phoning patients have a script but can also answer questions and address concerns.*
- ◆ *Plan phone calls after 4pm when more working parents might be available*
- ◆ *Send letters if telephone contact is not possible.*
- ◆ *Set a date – invite every eligible child before the end of October.*
- ◆ *Be tenacious – make multiple contacts until child is immunised or an active refusal is received.” (p.3)*

As part of their guidance for the annual flu immunisation, Public Health England also provide an invitation letter template for GP practices to invite parents to get their child vaccinated.¹¹

Similarly, a recent national review of GP practices has identified ‘the best practice’ which can significantly improve flu vaccine uptake rate amongst older adults which reflects PHE guidance. Practices achieved a 7% higher vaccination rate in patients aged 65 and above when they had a member of staff identifying eligible patients, planning the flu campaign, sending a personal invitation to patients and producing a written report of practice performance.¹²

III. Fieldwork findings

In this section we provide an overview of our fieldwork, which sought to explore what GP practices currently do to encourage 2, 3 and 4 year olds to have the flu vaccination, what barriers they face, and how parents experience the programme.

Primary care staff views on vaccination

In order to learn more about what is currently done in GM, we had planned to conduct fieldwork and interviews in 4-5 GP practices; speaking to GPs, primary care practice managers and practice nurses who lead on flu immunisation in their practice. Our original plan was to visit practices with different uptake rates (low, medium, high) and serving different demographic groups and to speak to a range of staff in each practice. Unfortunately, we faced challenges in contacting GP practices and organising interview time with them. As a result, we did ultimately manage to speak to staff members at four practices in GM. However, in all cases we had only a single telephone interview with one member of staff; three practice managers and one practice nurse. In addition, we interviewed one further practice nurse based outside of GM and recruited through BIT's own networks.

How GP practices manage the vaccination programme

Approaches to the childhood flu immunisation programme varied across the five practices. Interviewees told us that the practice manager or the practice nurse were usually responsible for coordinating the vaccination programme. The success of the programme is therefore very dependent on how much time and effort the practice manager or nurse are able to put into coordination. For example, interviewees believed that repeatedly calling parents to invite them, or holding more clinics hours, were effective in increasing uptake of flu vaccination. However, these are time-consuming activities.

All practices we spoke to said that they also tried to help GPs to opportunistically vaccinate patients by leaving prompts on patients' files or in the IT system used by GPs to record notes on their appointments. However, one practice nurse we spoke to did note that the vaccine (because it is given nasally) cannot be given when children have a runny or blocked nose; not uncommon amongst children attending to a GP appointment because they are unwell.

While practice managers and nurses obviously consider preparations for the flu season to be very important, and said that they had already started preparing, one of our interviewees realised during our call that they were not certain whether they ordered the vaccines for the coming flu season yet. This indicates that organising the vaccination programme may sometimes prove to be a challenge for already busy practice managers or nurses. There is a wealth of evidence in behavioural science that we misremember our own past behaviour, and that we can suffer gaps between what we mean to do (our intentions) and what we actually do (our actions).

Communication between GP practices and parents

The GP practices we spoke to reported using many different approaches to contact parents about the flu vaccination; including one or more telephone calls, sending letters (each practice seemed to use their own draft here, rather than using the PHE recommended letter) and several also used text messages (either to initially advertise the vaccine, or to remind parents who had already booked an appointment to turn up on the day).

One of the practices we spoke to had developed a more targeted approach to communicating with parents. This practice created two lists very early in the preparation process; one of children who had been vaccinated in previous years and one with the children who had not previously been vaccinated (either because they had only just become eligible or because they missed the vaccination in previous years). For the first group, the practice would use more light-touch communication methods: reception staff would call parents and the practice would send out generic invitation letters if necessary. For the second group of harder to reach parents, the practice would take more active steps to contact the parents, getting clinical staff to separately and repeatedly call parents and sending several follow up letters. This approach is backed up by evidence (summarised in our literature review) which suggests that previous vaccinated is the strongest predictor of whether a child will be vaccinated again.¹³

Barriers to flu vaccination faced by parents

Our interviewees mentioned several things that they believed could be barriers which prevent parents from vaccinating their children:

- ◆ Many parents believe that the vaccination itself can give children mild flu-like symptoms. We were even told of parents who came in for an appointment with their children, but eventually decided against vaccination because of the perceived risks.
- ◆ The nasal flu vaccination used for young children contains gelatine (a pork-based product). This means that some parents from Jewish or Muslim backgrounds are uncomfortable about their child having the vaccination. One practice noted that even parents who accepted the need to for their child to have other vaccines that contained gelatine (i.e. MMR) sometimes did not see flu as 'serious enough' to warrant the perceived breaking of a religious commitment.
- ◆ This issue of flu not being seen as a 'serious' illness was also common in our interviews, with both parents and practice staff.

One challenge here is that practice managers or nurses are more likely to remember instances where parents declined the vaccination, or took some time to discuss it, than those where the vaccination was given without discussion. A well-established finding in the behavioural science literature is that people use a mental shortcut called the '**availability heuristic**' when judging the importance or likelihood of something occurring. The 'availability heuristic' is a rule of thumb which says that something which is easy to remember must be important or commonplace.

A tricky conversation with a parent about the merits of the vaccination is likely to be much easier to remember than the many appointments that go ahead without problems (or the many parents who simply never reply to practice invitation letters). We think this may lead practice staff to overestimate the number of parents who have active concerns about the vaccination (or indeed, who have seriously considered its merits at all) against those who simply forget to book an appointment. For example, while there is some evidence that low uptake of the vaccination is driven more by a knowledgeable decision to forgo the vaccine, rather than a lack of awareness and information about it¹⁴, studies also suggest that 70% of UK parents want to have their child vaccinated but less than 40% manage to get it done.¹⁵

Data collection on flu vaccination

We were also interested in exploring how practices record and report childhood flu vaccinations. This is important when considering how to designing an evaluation to test changes to the invitation process. Where it is used in GM, practices can record vaccination in the EMIS system under the code 65EB1 for children. All the practices we spoke to used EMIS, although we are aware that other systems are used in some parts of the region. One of our interviewees reported that they intended to check this year if these records were correctly entered into the system because they had found large scale inconsistencies between EMIS figures and Immform submissions when they checked their performance last year.

Self-assessment of performance

Finally, we also asked our interviewees whether they knew the uptake rates in their practice. Despite coordinating their practice's flu immunisation programme, and receiving regular updates on flu uptake rates during the season itself, all of the estimated uptake rates we were given during interviews were higher than the official uptake rates in the NHS database. There may be several reasons for this:

- ◆ Uptake for young children lower than other groups who GPs are responsible for vaccinating. Practice staff may therefore struggle to recall their detailed uptake rates for each patient sub-group, and focus on their overall uptake rate.
- ◆ In particular, most surgeries are likely to have many more eligible elderly patients than young children and uptake rates for older people tend to be much higher.
- ◆ Practices could be systematically under-reporting their vaccination rates. This seems unlikely, as submissions determine the payment GPs receive. However, as mentioned above, at least one practice we spoke to suspected they had misreported last year.
- ◆ Information on flu uptake rates may simply get lost in the general 'noise' of a busy GP practice which has many targets and processes to monitor.

This suggested to us that the provision of clear, timely and focussed information on performance (either in absolute terms or relative to other practices) could be an effective way of increasing uptake. We explore this further in our literature review and trial suggestions.

Parental views on vaccination

To explore parents' attitudes towards vaccination in general, and flu vaccination in particular, we also conducted short interviews with a small sample of parents who had children aged between two and six (and thus are eligible or have been eligible in the past to receive the flu vaccination at a GP practice).

Our aim in these interviews is not necessarily to be able to draw more general conclusions about the broader population – it is to understand different types of experiences and how they might affect a person's beliefs and behaviours. However, it is worth noting that we spoke to a small, convenience sample of parents and we were unable to purposively sample (i.e. to identify specific types of backgrounds or experiences we wanted interviewees to have) for this qualitative work. This means we need to keep a number of caveats in mind when interpreting the information collected via the interviews:

1. Parents who are open to talking with us about childhood vaccination might be systematically different from the rest of the population. For instance, they may be more interested in helping to improve children's healthcare.
2. Only two out of the four parents we interviewed lived in GM. Although we do not know of any particular reason why parental attitudes might be significantly different in GM than in other areas of the UK, we still cannot interpret the findings from the interviews as the specific views of GM parents.

Despite the small sample size, several indicative patterns still came through in our interviews.

Poor recall and reliance on reminders

First, all four parents booked vaccinations in a reactive way after they had been invited. In general, parents we spoke to thought that getting their children vaccinated was easy because they had been reminded by their GP when a vaccination was due and had been offered an appointment or told about the clinics. None of the parents we spoke to could easily remember every vaccination their child had had. However, all were confident that they knew they'd had every available vaccination, usually explicitly citing the 'red book' as their confirmation of this. In fact, two interviewees actually found their 'red book' while we spoke to them so they could check what vaccinations their child had received. This presents a challenge for the childhood flu immunisation programme, as the flu vaccination is not currently listed in the red book (and even an immediate change would take a number of years to filter through to the eligible age range).

Three of the four parents we spoke to had their children vaccinated against flu last year. However, when asked to list the vaccinations their children had received, none of them mentioned the flu vaccination unprompted. Only when prompted by the interviewer did parents recall their child receiving flu vaccination. This suggests parents are less aware of the flu vaccine, likely it is relatively new for children aged two to four and is also dealt with differently to other routine childhood immunisations (with a different style of invitation and different processes for booking and attending appointments).

Experience of being invited

The three parents whose children had the flu immunisation struggled to remember how they heard about the vaccination. One parent did not remember receiving a direct invitation at all, but had seen a poster in the surgery and had proactively called up to book their child in. Two other parents thought they had been invited over phone or via a letter in the post. In one case, the parent remembered getting the flu vaccination appointment on a 'payslip style' letter sent to their house. This is interesting as this is the style of invitation issued by Childhood Immunisation Services (CHISs) for other routine childhood vaccinations. As far as we know, the CHIS does not issue invitations for the flu vaccination anywhere in GM. This suggests that this parent was mixing up this invitation with an invitation for another routine immunisation.

When prompted, most parents said they did not think of flu vaccinations very differently to other vaccinations (e.g. they had not really considered the vaccines efficacy or side effects, any more than they had for other vaccinations like MMR). However, again once prompted, they all agreed that they thought the flu vaccine was less important than other childhood vaccinations.

Reasons for not vaccinating

Out of the four parents we spoke to, only one had not had their child vaccinated against flu. It is worth restating that, with a single interview, we obviously cannot draw anything more than very indicative findings. Nonetheless, the interview does provide us with some useful insights. This parent told us that they had not received any invitation to a flu vaccination, although when pushed they thought that they might have seen it promoted somewhere. However, they said that they would not get their daughter vaccinated against flu, and this was because they believed the flu was not as serious as the other illnesses children usually get vaccinated against. However, they are planning to vaccinate their daughter now as she is going into school and the parent does not want her to be out of school unnecessarily.

This parent also said they had personally never had the flu and therefore would not immunise themselves against it either. This is despite the fact that this interviewee was a frontline healthcare worker and therefore strongly encouraged to be vaccinated. When told about the protective effect of herd immunity on vulnerable elderly people, the parent admitted that they had not thought about that before and that they might be willing to get the vaccination in order to protect others.

Increasing uptake

We asked all the parents we interviewed what they thought would improve uptake of flu vaccination or would help parents to get their children vaccinated against flu. Parents mentioned providing more information on the logistics (where, when and how), and explaining the potential consequences of not vaccinating, as potentially effective messages in encouraging and helping parents to get vaccinations done.

IV. Literature review

In this section we summarise the findings of a review of the academic literature. We begin by summarising findings from the literature about the common obstacles to increased uptake of flu vaccinations in young children. We then move on to an action-focussed review exploring how behavioural insights could be used to potentially increase rates of childhood flu immunisation.

Barriers to increased uptake of the childhood flu vaccination

A recent systematic review of the flu vaccine hesitancy literature¹⁶ identifies a range of common barriers to increased uptake, which tend to be about either GP behaviour or about parental beliefs and attitudes.

Perceived risk of the disease, disease severity, and severity of vaccine side-effects

If parents don't believe that their child is at risk of getting flu and don't consider flu as a particularly severe illness, they are less likely to have their child vaccinated. A UK study identified the lack of concern about catching flu as the most common self-reported reason for parents not vaccinating their child (cited by 43% participants).¹⁷ The second most common reason to forgo vaccination was concern about the vaccine being unsafe, causing short-term side-effects and overloading the child's immune system. According to the same UK study, 40% of vaccinated children experienced what parents perceive to be 'side-effects', such as runny nose, fever and other flu symptoms.¹⁸ However, parents might have a tendency to overestimate these symptoms and their severity.

Perceived utility

A key related question is about how effective parents believe the flu vaccination is. This is especially relevant in the case of flu immunisation because of the relatively unique way the vaccine is developed.¹⁹ Each year, a specific flu vaccine is offered based on the predicted most common flu virus strain for that year. The effectiveness of the flu vaccine fluctuates each season depending on how well it is matched with the actual circulating viruses²⁰. On average, the vaccine has a 50% effectiveness, but for specific seasons it can be as low as 3% (as was the case in 2015 due to a mismatch between the vaccine and the main virus strain).²¹ This mismatch was broadly publicised, leading to widespread awareness of the potential for mismatches.²²

As a result, it is not difficult to understand why some parents may not be convinced about the effectiveness of flu vaccination, particularly if they focus on specific years when the vaccine was especially ineffective (such as 2015) rather than the average effectiveness across years. Some evidence suggests that low uptake is driven more by a knowledgeable decision to forgo the vaccine, rather than a lack of awareness and information about it.²³ That said, many parents making the deliberate decision to forgo flu vaccination may base it on an inaccurate understanding of the information available. For instance, a UK study has found that only one in five parents managed to interpret 'the vaccine efficacy' correctly.²⁴

GP role: Messenger and Access

In the context of low levels of knowledge about the vaccine and uncertainty about its effectiveness, a widespread lack of GP endorsement also contributes to the low uptake.^{25,26} A lack of proactive GP involvement or advocacy makes it more difficult for parents and children to 'access' immunisation. Currently, most parents need to find out about the vaccine and be motivated enough to arrange an appointment which can be complicated due to conflicting timetables and GPs' busy schedules.²⁷

Past behaviour and past experience

Individuals who have been previously vaccinated or have recently suffered from flu are more likely to get vaccinated. A UK study has shown that the past vaccination tends to be the single strongest predictor of whether a child will get vaccinated again.²⁸ Conversely, those who personally experienced side-effects or witnessed such a case in their social circle will tend to shy away from immunisation.²⁹

Lack of follow through³⁰

There seems to be a substantial gap between parental attitudes and behaviour: 70% of UK parents want to have their child vaccinated but less than 40% manage to get it done.³¹ This means that even interested parents do not manage to follow through with their intention and overcome seemingly small barriers such as getting around to schedule and attend an appointment.

Demographic factors, such as socioeconomic status or ethnicity^{32 33}

A 2015 study has found that ethnicity and deprivation influence the childhood flu vaccination rates, with deprived neighbourhoods having a significantly lower uptakes than wealthier ones and neighbourhoods with higher proportion of Muslims also having significantly lower uptakes,³⁴ The latter is likely to be closely related to the fact that the childhood flu vaccination contains porcine (a pork-based product) and there is therefore some debate in the Muslim community about whether getting the childhood flu vaccination is permissible.

Using behavioural insights for childhood flu immunisation

In this section, we explore how behavioural insights could be used to increase uptake of the childhood flu vaccination. We summarise our ideas on Table 2 based on BIT's EAST framework that proposes that interventions to encourage behaviour change should be Easy, Attractive, Social and Timely³⁵.

Table 2: Suggested behavioural interventions from the literature to improve uptake of childhood flu vaccination

Improving childhood flu immunisation uptake	
Easy	<ul style="list-style-type: none"> ◆ Use defaults, i.e. pre-scheduled opt-out appointments ◆ Use active choice framing to reframe inaction as an active decision with consequences for the child ◆ Reduce friction costs by considering options for 'opportunistic delivery' at nurseries and children's centres
Attractive	<ul style="list-style-type: none"> ◆ Use loss framing with anticipated regret ◆ Consider financial incentives for parents or GPs
Social	<ul style="list-style-type: none"> ◆ Provide relative performance feedback to GPs ◆ Encourage GPs to act as expert messengers ◆ Harness parents' prosocial motivations
Timely	<ul style="list-style-type: none"> ◆ Provide timely reminders for GPs and parents ◆ Use deadlines ◆ Help parents to plan with 'implementation intentions'

Section 1: Making Immunisation Easy

Use defaults

People have a strong tendency to stick with the 'default' option: the pre-set option that will come about if they do nothing. This is because, in contrast to some classic approaches to human decision-making (especially in economics), people do not necessarily make decisions after carefully weighing costs and benefits of all available options. Inertia is a powerful driver of behaviour.

Behavioural research shows that when people have to make a choice between multiple potential options, at some point a 'choice saturation' occurs.^{36,37} It becomes more difficult to determine the optimal choice because of the amount of information being presented³⁸ and people will follow the path of least resistance and forgo making a choice altogether to avoid the extra cognitive effort.³⁹ Moreover, sticking with the default may be implicitly considered by people to be a safe option and is assumed to have been wisely pre-chosen by a policy-maker.⁴⁰ Remarkably, it has been shown that the default option influences people even when they make important life decisions, such as those related to pension saving,⁴¹ organ donations⁴² or end-of-life preferences.⁴³

Defaults can also influence the uptake of immunisation, as is suggested by the example of countries with 'mandatory' children vaccinations.¹ Given this obligation is not strongly enforced, it could be argued that it functions in reality as a powerful default. In this way, post-communist countries with a 'mandatory' MMR vaccination routinely achieve almost 100% uptake.⁴⁴ Similarly, providing women with a letter including a fixed appointment time for a cervical cancer screening, (where the default is that women are coming in for the check) as opposed to letters with an open invitation, increased uptake in Australia,⁴⁵ Italy,⁴⁶ and the UK⁴⁷. One study took this approach to encourage occupational health workers to have their flu vaccination by sending invitations for an appointment ('opt-out' condition), rather than simply inviting people to arrange one ('opt-in'). Inviting workers for a pre-scheduled flu shot appointment, with the day, time, and location led to a 36% increase in the.⁴⁸ The improved uptake is likely due to pre-scheduled appointments helping to counter the choice overload and friction costs (explained in more detail later in this review) related to arranging appointments, while conveying the sense that attendance is expected. In practice, uptake of the flu vaccination could be increased by offering parents with eligible children a pre-scheduled appointment by default, rather than waiting for them to 'opt-in' and actively book one.

Even more subtle suggestions of a default could help to reduce parents' hesitancy about the vaccine and increase uptake. A US study has shown that when pediatricians used an opt-out wording for offering the vaccine ("*Well, we have to do some shots today*"), rather than using an opt-in wording ("*What would you like to do about shots today?*"), parents were more likely to accept the vaccination for their child. The wording of the offer led to a complete reversal of parental preferences with only 17% of parents accepting the opt-in vaccination compared with 74% accepting with the opt-out wording.⁴⁹

That said, defaults tend to work best when compliance does not require any further action (e.g. auto-enrolment into a pension plan). In the case of vaccination, even parents defaulted into an appointment still need to actively follow through and turn up to the appointment. The use of defaults in this context would perhaps be most likely to be effective if accompanied by other behavioural approaches that would help to ensure follow-through.

Use active choice framing

Some parents may hesitate to have their child vaccinated because they are more concerned about directly causing harm (i.e. bringing about side-effects) than about failing to prevent the disease.⁵⁰ This can be explained by the omission bias which is the tendency to "favor omissions over [otherwise equivalent] commissions, when either one might cause harm."^{51 52} This means people often prefer not do something that would potentially avoid harm, rather than to do something that would potentially cause harm; they view a negative outcome (such as causing

¹ Given this obligation is not enforced, it could be argued that it functions as a powerful default.

harm) as worse if it is a result of action rather than inaction. For instance, people will judge withholding the antidote from a poisoned person less harshly than poisoning someone (in a hypothetical scenario), even though the consequences are exactly the same.⁵³ Studies have shown the effect of omission versus commission bias in the context of childhood vaccinations: omission bias tends to make parents reluctant to vaccinate their child, when the vaccine can cause adverse effects, even if the consequences of not vaccinating the child can be even worse.^{54,55}

The active choice approach⁵⁶ can counter the omission bias by showing that a lack of action is still an active choice with consequences, making omission feel more like commission. Taking this approach would involve asking parents to actively choose between: *'I want my child to be vaccinated'* and *'I don't want my child to be vaccinated'*. Moreover, people who actively make this decision could be more likely to behave consistently with their choice and to follow through on their intention to vaccinate with action due to a phenomenon called consistency bias, where people adjust their behaviour to ensure they feel that they have been consistent in their choices and decisions.⁵⁷

A study investigated the effects of presenting people with an active choice in the context of flu vaccinations.⁵⁸ In this study, people who were prompted to actively choose were significantly more likely to opt for a reminder to get a flu shot, compared to the group simply offered an opportunity to opt in (72% compared to 45%). This effect was even stronger when people were prompted with an 'enhanced active choice' which highlighted the advantages of getting a flu shot, and the disadvantages of not doing so: "I will get a Flu Shot this Fall to reduce my risk of getting the flu and I want to save \$50" (in this context, the saving was because the employer would pay) or, "I will not get a Flu Shot this Fall even if it means I may increase my risk of getting the flu and I don't want to save \$50."

Reduce friction costs

The behavioural science literature shows that 'friction' factors, which make a task marginally more effortful, have a disproportionate impact on whether people end up carrying out an action.⁵⁹ In other words, processes which involve an element of hassle to complete are less likely to get done.

It is likely that more parents would have their children immunised if they were not faced with the small frictions and hassle associated with accessing the vaccine. The process involves several steps: from realising the need for the vaccination, researching the topic, considering available options, calling their GP, managing to schedule an appointment during a busy pre-flu period, juggling their personal and their child's timetables, and attending the appointment with their child. This troublesome process means that a high level of motivation is required for a parent to follow through every single one of these steps in order for their children to be vaccinated. In fact, a previous trial by BIT has shown that a friction as small as a single additional click on a website makes people less likely to accomplish important actions, such as completing a tax payment.⁶⁰

Simplifying and streamlining the process for parents is therefore likely to increase uptake. One way to do this is to offer pre-booked appointments, as described above in the 'defaults' section. Another way would be to use opportunistic delivery of preventive and diagnostic health care. Examples of this approach include providing preventive services to chronically or acutely ill patients when they are visiting the doctors because of a specific current illness,⁶¹ offering diabetes testing at mosques during Ramadan⁶² or offering breast cancer screening at supermarkets.⁶³ A study found that offering people over the age of 75 the flu vaccination as part of a home health check increased uptake by 6.4 percentage points (from 67.9% to 74.3 %), compared to sending out invitation letters for a flu vaccine appointment.⁶⁴

One way of taking this approach with the childhood flu vaccination would be to extend the range of places where opportunistic vaccination is available. At the moment many surgeries already opportunistically vaccinate children if they attend the GP for another reason. However, this could be broadened, offering the vaccination at locations such as nurseries and children's centres (in the same way that older people can receive the vaccination at pharmacies)

Summary of recommendations to make immunisation easy

- ◆ **Use defaults:** Encourage GPs to send out personal invitations for pre-scheduled appointments framed as 'opt-out'
- ◆ **Use active choice framing:** Counter inertia by using active choice framing to reframe inaction as an active choice with consequences for child
- ◆ **Reduce friction costs:** Offer immunisation at nurseries, children's centres or opportunistically during a health check

Section 2: Making immunisation Attractive

Use loss-framing with anticipated regret

People are generally loss averse – we don't like experiencing losses, whether of money or possessions,⁶⁵ and we tend to experience a loss as twice as powerful as an equivalent gain and will work twice as hard to avoid it.⁶⁶

Evidence shows that framing something as a loss or a gain can influence uptake of health-promoting behaviours, dependent on how risky they are perceived to be. When faced with a risky situation (such as illness detection), people may be more sensitive to a message stressing the potential losses associated with not performing a behaviour (e.g. 'A failure to detect prostate cancer can cost a man his life'). On the other hand, when faced with a lower risk situation (vaccination, physical exercise), a gain framed message focussing on the potential benefits of a health behaviour may be more effective (e.g. 'Regular exercise can help you prevent heart disease and stroke').⁶⁷

Experimental evidence shows that vaccination is often (and perhaps counter-intuitively) perceived to be risky², which suggests that loss-framed messaging would be more appropriate. Surprisingly, there does not seem to be a significant difference between loss-framing messages and gain-frame messages in improving vaccination uptake when messages are targeted at the person who will be vaccinated.⁶⁸ However, loss-framed messages might be more effective than gain-framed messages in persuading people to vaccinate others; their children for example.

Loss-framed messages might be more effective because parents feel responsible for protecting their children and try to avoid feeling guilt and regret for failing to do so. This suggests that the effect of loss framing could be enhanced by using 'anticipated regret'. We tend to feel more strongly about negative events when we imagine how different the outcome might have been.⁶⁹ Anticipated regret refers to our tendency to take into account the possible regret we might feel in the future when deciding between several options.

Making anticipated regret salient in people's minds may therefore influence their behaviour and decisions. For example, more people expressed the intention to register as an organ donor when they read the following statement: *"If I didn't register as an organ donor and someone I cared about died that could have been saved, I would feel regret"*.⁷⁰ Evidence shows that messages using anticipated regret can be effective in increasing the uptake of cancer screening,⁷¹ physical exercise⁷² and mothers' HPV vaccination intentions for their daughters.^{73,74} More specifically, evidence also shows that anticipating regret is a strong predictor of the flu vaccine uptake.⁷⁵ Therefore, using loss-framed messaging with anticipated regret could be an effective approach to increasing uptake.

Consider financial incentives

Vaccines are highly cost-effective public health measures at the population level. However, for any individual, getting vaccinated entails costs today (such as the time lost or potential side-effects), a part of which will be compensated in the long-term (reduced likelihood of infection by the virus), but will also be shared with the broader community (by achieving herd immunity and thereby helping to protect others). We know that people often struggle to take these kinds of decisions, incurring short-term pain for vague or long-term gains, because of 'present bias' (our preference for sooner rather than later payoffs).⁷⁶ In the case of vaccinations, this means

² The perception of vaccination being risky could stem from concerns about the side-effects (such as the inaccurate beliefs that MMR causes autism) or beliefs in the lack of effectiveness in preventing the health issue itself (which has been shown to be the case for HPV: Gerend, M. A., & Shepherd, J. E. (2007). Using message framing to promote acceptance of the human papillomavirus vaccine. *Health Psychology*, 26(6), 745)). Flu vaccination could be perceived as risky due to doubts about its effectiveness and a high parental sensitivity towards side-effects.

that people may focus on the costs they bear in the present, rather than the benefits to them and others in the future. However, these immediate costs could potentially be offset by a reward or incentive, helping to persuade people to get the vaccination.

Introducing even small financial incentives can be effective in increasing uptake of 'one off' behaviours³ such as screening or vaccination.⁷⁷ A systematic review found that financial incentives were better at encouraging healthy behaviours (such as smoking cessation, attendance for vaccination or screening, and physical activity) than no intervention or usual care.⁷⁸ Studies have shown that small financial incentives can increase the flu vaccination uptake in a range of different contexts. In a trial conducted at 6 US colleges, a net incentive equal to \$10 increased flu vaccination rates by 7.8 percentage points, while a higher incentive of \$30 led to an increase of 12.4 percentage points.⁷⁹ In a different study, giving an incentive as modest as a \$5 gift card significantly increased the uptake of workplace flu vaccination (which was already offered free on-site and advertised).⁸⁰

Another way of offering incentives, which can be more cost-effective, is to offer them in the form of lotteries. People tend to overestimate small probabilities, which means that lotteries can generate disproportionate interest and be a very cost-effective tool to change behaviour. In a small US study, a lottery ticket⁴ combined with a prompt (a letter reminding parents to vaccinate their preschool-aged children) resulted in 17.7 percentage point increase in vaccinations received (from 4.8% to 22.5%).⁸¹

Financial incentives may also be an effective way of motivating GPs to do more to encourage parents to bring their children in for vaccination. A recent UK review of GP practices has found that those entitled to financial reward (via the Quality and Outcomes Framework, QOF⁵) for hitting a 75% uptake rate for people aged 65 years or older were more active in contacting patients and tended to achieve higher uptake rates. For instance, patients received 42% more reminders to attend their vaccination if their GP was to be rewarded via the QOF for completing the vaccination.⁸²

Unfortunately, childhood flu immunisation is currently only incentivised only by individual payment of £9.64 for administering each flu jab⁸³ rather than hitting a specific QOF target for vaccinating a given share of population. Compared to a lump sum received for hitting a target, this may mean that the incentive per case seems too small. Across Greater Manchester an average GP practice has around 250 2, 3 and 4 year olds eligible to receive the childhood flu

³ By 'one off' behaviours we mean behaviours completed in one go in a given point of time rather than behaviours continually repeated (such as eating habits or physical exercise). That said, even these 'one off' behaviours – such as cancer tests – end up being completed repeatedly over the course of a person's life.

⁴ The lottery ticket was for three potential monetary prizes: \$100, \$50, and \$25.

⁵ QOF is a programme of annual financial rewards for GP surgeries, which forms part of the GP contract in England and Wales.

vaccination in surgery. Uptake is currently around 37% in total, meaning the average GP could make an additional £1,500 if they achieved 100% vaccination, or £290 if they achieved the herd immunity rate of 50%. Highlighting these foregone sums to GP practices may encourage them to take further action. This could be made even more effective by using 'loss aversion' (see 'Use loss-framing' above). Evidence shows that making people feel they already own a future reward and can lose it if they fail to achieve a level of performance, can lead to better outcomes. For example, research found that giving upfront bonuses and taking them away if performance was inadequate can improve employees' performance more than standard reward methods.⁸⁴

Summary of recommendations to make immunisation *attractive*

- ◆ **Use loss framing with anticipated regret:** Use loss-framed messaging with anticipated regret to encourage parents to get their child vaccinated
- ◆ **Consider financial incentives:** Introduce a small financial reward or a lottery for parents; Introduce a financial reward for GPs for vaccinating a target share of GM population; Harness loss aversion by letting GPs know how on how big reward they are missing out within the current payment system by failing to achieve a certain rate of uptake (e.g. for instance, using a sum received if vaccinated all eligible patients or as many patients as their peers achieving higher uptake rates)

Section 3: Making Immunisation Social

Provide relative performance feedback

Providing relative performance feedback (i.e. telling people how they compare to their peers) is a well studied approach in social psychology.⁸⁵ In the context of flu vaccination, this would involve encouraging GPs to reach out more actively to parents by letting them know how their practices' uptake rate compares to similar surgeries.

Peer-comparison feedback has proved effective at reducing over-prescription,⁸⁶ excessive diagnostic test use⁸⁷ and unnecessary referrals.⁸⁸ For example, in one large trial run by BIT, we achieved a 3.3 percentage point reduction in antibiotic over-prescription by informing GPs that their practice was prescribing at a higher rate than the majority of other practices in their NHS Local Area Team.⁸⁹

A systematic review found that feedback interventions reporting on performance can also be effective in encouraging physicians to improve immunisation rates, especially for one-off vaccinations.⁹⁰ Changes in immunisation rates in these flu vaccination studies ranged from -4% to +48%, with an average effect of 20%.

Encourage GPs to act as expert messengers

Messengers can often matter as much as the message; we can respond to the same information very differently depending on who makes it. One way messengers can have an impact is through the perceived authority, whether formal or informal, of the person giving us information. For example, there is evidence that people are more likely to act on information if experts deliver it.⁹¹

Encouraging GPs to be the expert messenger who communicates messages about vaccination to parents could be especially promising, given parental doubts about the effectiveness of flu immunisation. Studies have consistently found that a lack of GP endorsement of and personal invitation for flu vaccination is one of the key reasons behind the low uptake.^{92 93 94} Crucially, GPs are the key actors who could be used as the messenger to back up several ideas discussed in other parts of this review, ranging from offering defaults to sending behaviourally-informed invitations and reminders. This might be encouraged in a number of ways, including through feedback or incentives.

Harness parents' prosocial motivations

Given the perception of the low individual usefulness of flu immunisation, highlighting the wider social benefits of children's vaccination could be an effective way to improve the uptake.⁹⁵ Research has shown that people who are more aware of the benefits of immunisation for others are more likely to get vaccinated.⁹⁶ There is also additional evidence based on studies using hypothetical scenarios and indirect measures of behaviour (like a person's stated intention to get vaccinated) which suggests that highlighting the social benefits of vaccination may encourage people to get vaccinated.⁹⁷ However, this additional evidence needs to be treated with caution as there is frequently a substantial gap between people's self-reported intentions and their actual subsequent behaviour.

Using prosocial motivation may be sensible given that the flu vaccination benefits older people as much if not more than the children vaccinated. Qualitative evidence gathered from interviews shows that parents tend to cite 'the benefit of others' as an important driver behind vaccinating their children⁹⁸. For example, another study (which again only looked at intention rather than subsequent behaviour) found that emphasising the benefits for the child, or for the child and for society, increased self-reported intentions to have the MMR vaccine. By contrast, emphasising just the benefit to society had no effect.⁹⁹ This suggests that further research is needed to determine whether eliciting prosocial motivation could be effective, especially for flu vaccination where the benefits to others are arguably greater than the benefit to children directly.

Summary of recommendations to make immunisation *social*

- ◆ **Provide relative performance feedback:** Inform GPs how they perform relative to other practices in their borough, in GM or in England
- ◆ **Encourage GPs to act as expert messengers:** Encourage GPs to endorse, recommend and actively attract patients for childhood flu vaccination; Use GPs as messengers for various behaviourally-informed communication targeted at parents
- ◆ **Harness parents' prosocial motivations:** Target parents with messaging highlighting the benefits to child and broader society, i.e. older people in particular

Section 4: Make Immunisation Timely

Provide timely reminders

Timely prompts have been found to be effective in a number of different situations to help people to follow through with a particular action. Examples include providing advance-warning text messages to improve court fine payment before bailiff visits,¹⁰⁰ using the moment individuals are writing their will to increase charitable giving¹⁰¹ or using milestone moments to increase attendance of cancer screening.¹⁰²

In the case of flu vaccination, the question is not whether reminders could help but which type of reminder will have the biggest impact. In terms of reminders for GPs, the best practice seems to combine IT prompts¹⁰³ with additional reminders – such as post-it notes – by practice managers or nurses.¹⁰⁴ In terms of reminders to patients, evidence from a recent meta-analysis suggests that a letter reminder is more effective than a telephone recall, leading to a significant 11% increase in the uptake compared to 4% for the calls.¹⁰⁵ It is not known whether multiple letter reminders could be more effective than a single letter.¹⁰⁶ Looking at other modes of communication, evidence shows that text message reminders further improve on letter reminders. In a US 'Text4Health' study, sending texts to parents whose children were due for meningococcal (MCV4) and/or tetanus–diphtheria–acellular pertussis (Tdap) immunisations led to a sustained higher uptake compared to a letter reminder.¹⁰⁷

Not only the form but also the content and the timing of the reminder messages matter. BIT has examined how to use behavioural framing to optimise the content in text messages that were intended to maximise attendance rates at medical appointments (i.e. aiming to reduce the "Do Not Attend" (DNA) rate, when patients are marked as not having attended their appointment). For example, making the cost to the NHS of non-attendance more salient decreased the DNA rate by 24%.¹⁰⁸ Along these lines, text messages to parents could draw on many insights mentioned in this review, such as defaults or framing.

Highlight key deadlines

One way to potentially enhance the effectiveness of reminders could be to highlight deadlines. Timely deadlines increase the perception of a “limited time only” opportunity, and hence encourage people to act. In the case of flu vaccination, the window-of-opportunity for vaccination often ends with the onset of the flu season (i.e. December), and this could be an effective deadline to use to prompt parents into action.

Help parents plan

Even when people intend to get vaccinated, and are provided with prompts to help them achieve this, people may still fail to follow through due to forgetfulness, a lapse in willpower, or other difficulties or distractions. Behavioural research suggests that creating a concrete plan of action detailing what someone will do, and where and when they will do it, can help bridge the gap between intentions and actions and increase the likelihood that a behaviour will be carried out.¹⁰⁹

Evidence shows that this kind of planning support can improve the attendance of colonoscopy¹¹⁰ and breast screening¹¹¹ appointments. A US study also found that this approach worked for immunisation, with vaccination rates increasing from 33.1% to 37.3% when participants were asked to write down both the time and the date when they planned to be vaccinated.¹¹²

Summary of recommendations to make immunisation *timely*

- ◆ **Provide timely reminders:** Encourage GPs to use IT-based and other reminders; Send parents behaviourally-informed letter and text reminders
- ◆ **Highlight key deadlines:** Highlight the deadlines for getting immunised before flu season
- ◆ **Help parents plan:** Prompt parents to plan the attendance of their children’s flu vaccination appointment using ‘implementation intentions’

V. Opportunities to trial changes to the childhood flu programme

Our fieldwork and literature review show that behavioural insights have the potential to improve communication with parents and encourage them to get their children vaccinated. In this final section we bring together these findings to summarise three potential projects we could work on with GMHSCP, in each case to rigorously testing how a behaviourally-informed intervention could improve uptake of the flu vaccination.

Some of the findings of our fieldwork and literature review point to recommendations that some GPs already do. For example, we know that some GP practices already provide timely reminders using SMS messages and encourage their GPs to act as effective expert messengers (for example by signing letters themselves, or opportunistically delivering the vaccination during routine appointments). In these cases, we recommend that GMHSCP does what it can to expand these best practices to more surgeries and to provide practical support to help them implement these changes (for example by providing sample draft text message text). In this section we do not focus on these types of changes and instead focus on recommendations and findings which we think are not as widely adopted, and which could be tested to measure their effectiveness.

The first two of our suggested projects focus on altering communications to parents or GPs, as per the original suggested scope of this project. The third considers the potential for testing larger or more complex changes. Our three potential projects are:

1. Nudging parents through altering existing communications
2. Nudging GPs through a one-off communication
3. Making broader structural changes to the way vaccinations are delivered

Option 1 – Nudging parents

One of the core goals of this project was to try to identify light-touch changes, informed by behavioural insights, which could be incorporated into communications with parents to increase vaccine uptake. Based on our fieldwork and literature review, we believe the following interventions could be particularly effective and may not currently be widely used by GP practices. We would recommend testing one or more of them against each other:

- ◆ **Use enhanced active choice to make the costs of inaction salient to parents.** This approach involves re-framing inaction by parents as a conscious decision. For example, invitation letters could include the following choices:

“I want my child to be vaccinated to reduce their risk of getting flu and requiring care’ OR

‘I do not want my child to be vaccinated even if it means I may increase their risk of getting the flu and requiring care’”

- ◆ **Use loss framing with anticipated regret.** This approach involves making the potential downsides of not getting children vaccinated more salient, and trying to encourage parents to consider the potential regret they would feel if their child became ill when deciding whether to act. For example, invitation letters could use the following types of messages:

"If you don't vaccinate your child, they won't be protected against the flu"

"Imagine if your child caught the flu, or passed it onto an elderly or vulnerable relative. The flu jab is quick and easy and protects your child and the people they spend time with."

- ◆ **Use deadlines.** Imposing (even somewhat artificial) deadlines on people can increase the perception of a "limited time only" opportunity and hence encourage them to act. In the case of flu vaccination, this deadline exists as the vast majority of vaccinations happen by mid-December. Messages that highlight this deadline could be effective in prompting parents. For example:

"The flu season starts in mid-November –remember to get your child vaccinated before it begins"

"The flu vaccination is only available until December, so please get in touch quickly and don't miss out on this opportunity to protect your child"

- ◆ **Help parents to plan with 'implementation intentions'.** Implementation intentions are concrete plan of actions that help people to bridge the gap between their intentions and actions by specifying when, where and what they will do. Such techniques could include prompts to parents encouraging them to call the GP practice at a specific time to book an appointment (e.g. after breakfast next morning), or prompting them to write down the date and place of the flu vaccination appointment once they have booked it:

"Please call us immediately to book your vaccination. Then use the tear-off slip below to record your appointment time and stick it to the fridge to help you remember to come along."

"Don't forget to book your appointment as soon as you can. Our phone lines open at 8am on weekdays, so why not call just after breakfast tomorrow?"

Example letters

Below we provide two examples of potential reminder/invitation letters that bring together these insights. These are offered to provide an indicative sense of how the insights outlined above could be practically incorporated into an invitation or reminder letter. They are not designed to be fully finalised, ready to use interventions and would require further amendment and discussion with GMHSCP, primary care staff and other interested partners.

Dear [Parent Name]

Oliver's annual flu vaccination is now due.

What will you choose to do?*

- ☐ I want Oliver to be vaccinated to reduce his risk of getting the flu and requiring care and **I will book an appointment** today by calling [practice number].
- ☐ I do not want Oliver to be vaccinated, even if it means I may increase his risk of getting the flu and requiring care.

The vaccination is free and recommended for young children, and will be given by a quick and simple spray up the nose.

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

We look forward to seeing Oliver soon.

Yours sincerely,

Sent on behalf of your GP by the flu immunisation programme/

* This is for your personal use only, you do not need to return this letter.

----- ✂ -----

Please record the date and time of your child's vaccination appointment here and put it in an obvious place in your home.

Vaccination appointment:

on: ____/____/____ at ____am/pm
Date Time

Figure 1: Example flu invitation letter 1 using active choice, planning prompts and implied default language

Dear [Parent Name],

Amelia's annual flu vaccination is now due.

If you don't vaccinate Amelia, she won't be protected against the flu. Would you regret it if Amelia caught the flu, or passed it onto a loved one, because she hadn't been vaccinated?

If so, book an appointment today by calling [practice phone number].

The vaccination is free and recommended for young children, and will be given by a quick and simple spray up the nose.

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

We look forward to seeing Amelia soon.

Yours sincerely,

|

Sent on behalf of your GP by the flu immunisation programme

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Please record the date and time of your child's vaccination appointment here and put it in an obvious place in your home.

Vaccination appointment:

on: ____/____/____ at ____am/pm
Date Time

Figure 2: Example flu invitation letter 1 using loss-framing with anticipated regret, planning prompts and implied default language

Evaluation approach

A core element of this project was to explore how behaviourally-informed changes to the childhood flu vaccination programme could be rigorously tested to measure their impact on uptake. In order to test changes to parental invitation/reminder letters against each other, and robustly measure the impact of these changes, we would recommend running a Randomised Controlled Trial (RCT). This would involve randomly assigning parents to receive one of a number of invitation/reminder letters and then measuring subsequent uptake.

Initial estimates⁶ suggest that we would need to test each new letter with at least 1,000 parents per letter to confidently detect an improvement of 6 percentage points or at least 2,000 parents per letter to confidently detect an improvement of 4 percentage points. The larger the sample the more certain we could be of smaller differences between the letters.

Error! Reference source not found.below plots the size of improvement we could confidently detect (known technically as the 'minimum detectable effect size') as a function of the number of children involved in the trial. The blue line plots this relationship in the case of a three-armed trial (testing three letters against each other, or two letters against taking no action). The orange line plots this relationship for a two-armed trial (testing two letters against each other, or one letter against taking no action).

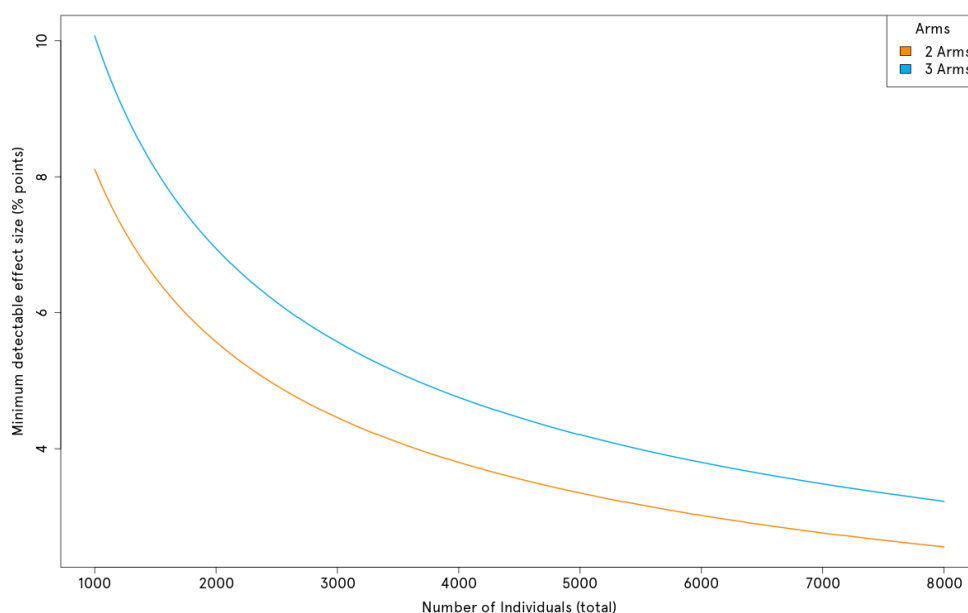


Figure 3: Minimum detectable effect size per number of individuals recruited for individually randomised trial

⁶ These figures are based on uptake for practices in Bolton during the 2016/17 flu season. Bolton was chosen because it was the area where a project seemed most feasible (due to a strong relationship between Bolton CHIS and GMHSCP). However, these figures will be broadly applicable to other GM areas.

Delivering a trial of this kind could be achieved in one of two ways:

1. Working with volunteer GP practices

The Partnership and BIT could recruit GP practices and work directly with them to test alterations to existing initial invitations or reminders. This would involve recruiting around 10–15 practices to have a sufficient sample size (based on an average eligible population of 250–300 children per practice). We would then work with these practices to agree a common approach to either initial invitations or subsequent reminders, with each practice agreeing to randomly allocate their patients to receive one of a number of letters (or to receive no letter if we were testing reminders later on in the season). Anonymised data on both eligible patients and subsequent could then be shared between the individual practices and BIT for evaluation purposes. In our view this approach would be logistically challenging. Recruiting a sufficient number of practices, coordinating approaches across them, putting data protection and sharing processes in place and coordinating the trial itself would be time-consuming.

2. Test an additional GM-level or borough-level letter

An alternative approach would be to test one or more reminder letters against each other, but these would be sent directly by the Partnership or another borough- or GM-level NHS organisation (for example, Bolton Childhood Immunisation Service has indicated they would be willing to do this). Rather than seeking to harmonise approaches across multiple GP practices, this would simply test whether an additional reminder could improve on the 'business-as-usual' approach (which varies across GPs). The challenge with this way of running the trial is finding data which is available at a level above individual GP practices and which enables us to identify which individual children have had the vaccination. The Manchester CCG Data Warehouse would potentially enable this to be done for patients in Manchester, however we have been unable to identify an alternative source of data which could achieve this for other areas of GM.

Option 2 – Nudging practices

An alternative way of testing the impact of behaviourally informed communications is to test delivering one or more messages directly to GP practices, which are designed in turn to encourage them to take more effective action to increase uptake. There are three potential interventions we believe might be effective to encourage GPs to vaccinate more children and are feasible to do as part of this trial:

- ◆ **Use performance feedback and targets.** Providing feedback to GPs about their performance on the uptake of the childhood flu vaccination specifically (rather than as part of broader feedback on the overall flu programme) could be effective. This could take one of two forms. First, our fieldwork suggested that practices can over-estimate their uptake rates. Although practices are regularly given information about their uptake rates and eligible population, this information is detailed, complex and

covers performance for all different patients groups. A clear, simple letter which provides information only on childhood uptake could be effective in making this more salient at a time when practices can still act on it (for example mid-way through the season). Such feedback could be bolstered by translating percentages into a numerical target for the practice (based on a 50% uptake target); triggering the so-called Zeigarnik-effect (our desire to complete an incomplete process).¹¹³ Example messages could include:

"You are only 20 children away from your target for 2-4 year old flu immunisation this season. Is there anything else you can do to get over the line?"

"Remember, uptake for the flu immunisation is lower for children than older adults. But protecting children is one of the best ways of protecting vulnerable older people. You are only 15 children away from hitting the 50% herd immunisation target in your practice."

- ◆ **Provide relative performance feedback.** A second way of providing performance feedback is to give it to GPs in relative rather than absolute terms, letting them know how they compare to practices in their area. We know that peer-comparison feedback has proved effective in a range of clinical settings, reducing over-prescription,¹¹⁴ excessive diagnostic test use¹¹⁵ and unnecessary referrals.¹¹⁶ The challenge with this type of intervention is that absolute performance across GM is still below target, so relative feedback would need to be designed carefully to minimise the risk of back-firing. In addition, feedback of this kind needs to be accompanied with clear, practical suggestions about what practices can do to increase their performance. For example:

"The great majority (75%) of GP practices in Bury have delivered more childhood flu immunisations than yours. PHE has identified that the best practices do all of the following things. Are there any extra steps that you could take to increase your uptake rate?"

- ◆ **Encourage GPs endorsement and messaging by correcting misapprehensions.** We know from the literature that effective GP endorsement is a powerful way of increasing uptake. However, our fieldwork suggests that some primary care staff may not appreciate how crucial this role is. They may also hold mistaken or exaggerated beliefs about parental willingness to vaccinate. A small number of memorable, detailed discussions with concerned parents may (via the availability heuristic) lead staff to believe most parents are making an active decision not to vaccinate. Correcting this misapprehension, emphasising that 70% of parents intend to get their child vaccinated, and stressing the importance of active GP endorsement could encourage action. Example messages could include:

"Did you know that most parents intend to get their child vaccinated but never get round to it? Just because a parent doesn't respond to a reminder letter doesn't mean they don't want to vaccinate. Parents would really appreciate you reminding them again."

"I know that getting children into the surgery can be hard. But 70% of parents intend to get their child vaccinated, many just don't get round to doing it. Parents really appreciate you contacting them to remind them to come in and get the vaccine."

Example letter

Below we provide an example letter which brings together some of the above insights. This is again offered to provide an indicative sense of how the insights outlined above could be practically incorporated into a communication and is not designed to be a fully finalised, ready to use intervention.

Dear Mr/Mrs XXXXX,

YOU ARE ONLY 35 CHILDREN AWAY FROM YOUR 50% CHILDHOOD FLU TARGET

The childhood flu vaccination is a crucial part of the NHS immunisation programme. It protects children themselves and the vulnerable people they come into contact with. But this only works if at least 50% of children are vaccinated. At the end of last month, your surgery had vaccinated 36% of your eligible population. **This means you are only 35 children short of your target.**

I know that getting children into the surgery can be hard. But 70% of parents intend to get their child vaccinated, many just don't get round to doing it. Parents really appreciate you contacting them to remind them to come in and get the vaccine.

The best practices use a mix of different approaches to increase their take-up rates. I know that you will be doing many of these things already but is there anything extra you could do to help you get over the line?

- ☐ Set up IT system reminders to encourage all practice staff to offer opportunistic vaccinations
- ☐ Use PHE's best practice invitation letter (bit.ly/fluletter)
- ☐ Send short SMS adverts to parents who have not yet been in to the surgery
- ☐ Offer clinics outside of work time, or drop-in clinics which don't need to be pre-booked

For more information on best practice, look at PHE's best practice guide (bit.ly/fluguidance).

Thank you for helping to get children vaccinated across Greater Manchester,

Yours sincerely,

Figure 4: Example GP nudge letter using performance feedback and correcting misapprehensions

Evaluation approach

Because this project seeks to alter GP behaviour (and, by extension, parental behaviour) it is not possible to test it at the individual parental level. However, we believe this approach could still be tested using a clustered RCT. In this approach, GP practices across GM would be randomised to either receive a 'nudge' letter or not. At the end of the trial, we would measure the impact by comparing practice-level uptake rates.

Because there are many fewer practices than patients, a trial of this kind would only be feasible if delivered across Greater Manchester rather than in a single borough. Our indicative analysis, based on uptake rates for the 2016/17 flu season, suggest that we would need to see an improvement of 4-6 percentage points in uptake to be confident in our results. A difference of 4 percentage points would be needed if we tested one 'nudge' letter against no action, a 6 percentage points increase would be needed if we tested two (see **Error! Reference source not found.**).

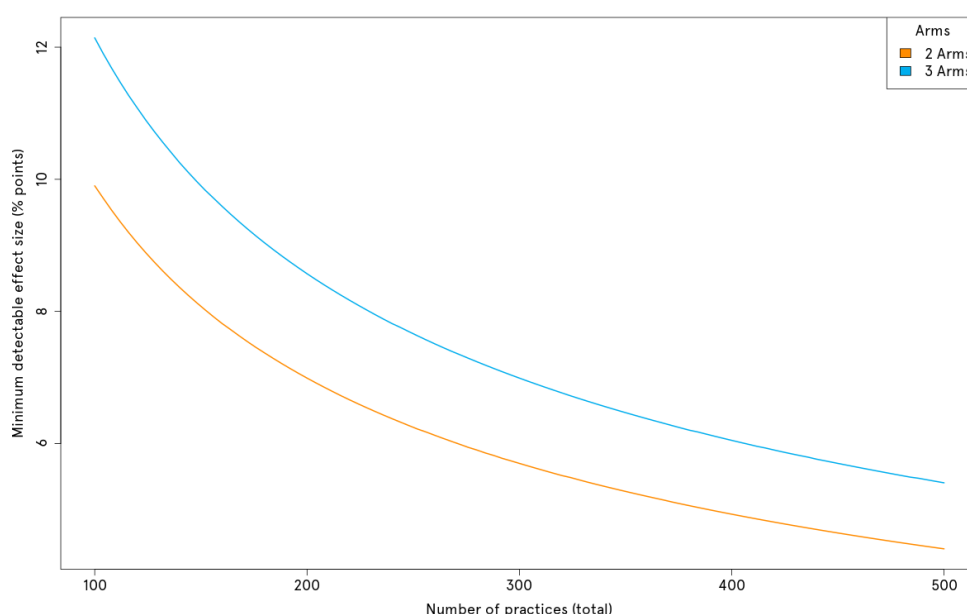


Figure 5: Minimum detectable effect size per number of GP practices recruited

Option 3 – Wider changes to how the immunisation programme is delivered

The main scope of this project was to explore whether light touch, behaviourally informed changes to communication with parents or GP practices could increase uptake of the flu vaccination. However, during our research we have also come across two interventions which we believe could be particularly effective in increasing uptake, but which would require larger changes to the way the vaccination programme is coordinated and delivered. Because such broader changes were not part of our original planned scope, we have not worked them up into clear projects (with clear evaluation strategies) in the same way as Options 1 and 2. However, we

present them for interest and would welcome further discussions with GMHSCP about how they could potentially be implemented and tested in GM.

◆ **Give parents default, opt-out appointments.** Our literature review showed that providing patients with a single, default appointment has increased rates of cancer screening and flu immunisation amongst healthcare workers. We think this approach has the potential to significantly improve uptake of the flu vaccination. During fieldwork interviews with parents, all mentioned the letters they had received from the CHIS for other routine childhood immunisations. These are clear, short and usually contain a default appointment which parents are asked to either attend or to call and re-arrange. This approach is powerful because it changes the default from op-in to opt-out and because it reduces frictions in the process and eliminates the risk of 'choice overload' (the risk that people, when presented with too many options, fall back into inertia and do not act). Taking this approach would be logistically complex, as there are many systems in place that enable CHIS's to pre-book these appointments at surgeries. A simpler, but similar approach would be to send parents 'implied default' appointments which are, in fact, the times of open-access immunisation clinics which the practice already runs. This still requires some care to arrange (to ensure too many parents do not turn up to a single clinic and have to wait around) but is likely to be logistically simpler than a genuine default appointment system.

◆ **Offer opportunistic vaccinations in other settings (like nurseries).** In our introduction, we highlighted evidence showing that vaccinations through school-based models achieves significantly higher uptake than GP-based models. There are strong behavioural reasons why this should be the case; it creates a social pressure in which many children are being vaccinated at the same time, it feels slightly more like a default option (parents are asked to consent, not to call if they would like to book) and it significantly reduces the frictions in the process. Similar benefits would be present for opportunistically vaccinating children in other settings where they commonly spend a lot of time, for example nurseries or children's centres. We know that this approach would be challenging because of the way vaccines are currently funded in the NHS. However, we believe it could be extremely effective in increasing uptake.

VI. Conclusion

In this report, we have summarised the current NHS approach to childhood flu immunisation, findings from fieldwork with primary care staff and parents, and an academic literature review exploring barriers to vaccination and potential changes to improve the process. On the basis of this research, we believe that behavioural insights could be used to improve uptake of the childhood flu vaccination through low cost and practical interventions. We have suggested two potential, light-touch projects which we could run with the GMHSCP to test changes to communications with parents and GPs designed to increase uptake. We have also set out two broader, more systemic changes to the immunisation programme which we think could have a real impact.

Unfortunately, for a number of logistical and other reasons we have not been able to deliver this Scoping Report as early as we had hoped. Difficulties securing fieldwork with GP practices, identifying potential sources of data and finding organisations willing to partner on a project have all made it difficult for us to finalise our report. This means that we are now already well into the flu season. Some of the projects we have suggested here would require a significant amount of preparatory work with GP practices and others partners. Others would require NHS Health Research Authority (HRA) and/or Research Ethics Committee (REC) approval.

Given the limited time available before the immunisation season is over, we recommend that the GMHSCP do not proceed with either of our project options this year. We have not made this recommendation lightly, as we strongly believe behavioural insights could help to improve vaccination uptake and we are keen to test this. However, we believe the risk that projects could not be organised in enough time, or that they hit delays caused by factors outside of our control (for example the HRA/REC approval process) is too high.

We would welcome any further conversations with the GMHSCP about the contents of this report, or how the Partnership can act on our findings. In particular, we are happy to discuss further how any of our findings could be fed into any existing or planned activity for the 2017/18 flu season (though we urge some caution about implementing some of our suggestions without rigorously testing them first). If it is of interest, we would also be keen to discuss the potential to test one or more of these approaches next year.

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