

## Executive Summary of final report

HRC 12-722 contract 'Translating best practice research to reduce equity gaps in immunisation'

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# Identifying factors behind general practice use of Practice Management System codes 'non-response' and 'decline' for the infant immunisation programme and investigation of reasons for partial immunisation

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**Prepared for:**

The Health Research Council  
of New Zealand and The  
Ministry of Health

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**Date:** 31 July 2015

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**Additional research:**

**Identifying factors behind general practice use of Practice Management System codes 'non-response' and 'decline' for the infant immunisation programme**

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## EXECUTIVE SUMMARY

### Background

This research is an extension of the 12-722 contract ‘Translating best practice research to reduce equity gaps in immunisation’ and is funded by the Ministry of Health and Health Research Council. The focus on this area of research is to identify features at the general practice level that support or hinder obtaining and maintaining high immunisation coverage.

New Zealand has made excellent progress in improving immunisation rates in the past fifteen years, however we have not fully attained the stated goals of 95% fully immunised at 2 years and 8 months of age. The remaining 5 -10% of children who are not immunised by target dates consist of those who either have not engaged in time with the provider (‘non-responder’) or those whose parents/caregivers have chosen to actively decline the whole or part of the immunisation schedule (‘decline’).

The international term for choosing to delay the receipt of a vaccine is *vaccine hesitancy* which is defined as “delay in acceptance or refusal of vaccines despite availability of vaccination services”. There has been growing research attention to this issue as the world fails to obtain and maintain high immunisation coverage for childhood immunisation programmes. The international framework that was developed and promoted by the WHO Strategic Advisory Group of Experts in 2014 has identified that vaccine hesitancy is a complex mixture of three key domains 1). Contextual influences – including history, socio-cultural, environmental, health systems/institutional, economic or political factors; 2). Individual and group influences; and 3). Issues directly related to the vaccine and vaccination processes.

In New Zealand (NZ), it is recognised that there is significant variability between general practices in their ability to achieve and maintain high immunisation coverage and one strong driver behind this variability is likely to be characteristics within the practice, not just with the parents/caregivers and community they live in. This study was designed to investigate the patterns behind why children are not fully immunised at the general practice level.

Part one of this study is designed to further describe and delineate the volume and patterns of partial immunisation in NZ, with the impetus to provide information that will contribute to meeting current and future immunisation targets.

Part two of this study is to focus on understanding more around the patterns behind the coding of the non-immunised at the general practice level, both those coded as ‘non-responder’ and those coded as ‘decliner’. The study was deliberately designed not to focus on communities where there are high rates of decliner but to consider the approaches at the general practice level, both practitioner behaviour and the use of systems in identifying and coding individuals as having declined a vaccination event or not responded to an invitation to attend a vaccination event.

Part three of this study is to geocode the 21 DHB areas, showing practices with high and low decline rates. This is intended to help identify local ‘clusters’ of practices with a high decline rate (suggesting a local population that ‘declines’ immunisations) and also identify practices who stand out as being a practice with a high rate of decliners which is not associated with a local high decline ‘cluster’ area.

## Aims

### Primary

1. To characterise the infant population on the National Immunisation Register (NIR) identified as non or partially immunised defined by the groups: Declining all immunisations; Selective immunising by opting out of specific vaccines; Incompletely immunising by receiving some events but not completing the series.
2. To determine the patterns behind coding in the general practice system children as 'decline', 'non-responder', or 'not fully immunised'. To identify provider-related reasons behind these patterns.
3. To use this information to enable development of better vaccination strategies. Improved strategies will support improved immunisation coverage outcomes.

### Secondary

1. To show geographic patterns in NZ of general practices with high and low decline rates by the use of geocoding maps.

## Specific Objectives

### Part One: Approaching the target – characterising partial immunisation in New Zealand.

- Characterise the infant population on the National Immunisation Register (NIR) identified as non or partially immunised on general practice data bases. Identify the groups as:
  - Declining all immunisations
  - Selective immunising by opting out of specific vaccines
  - Incompletely immunising by receiving some events but not completing the series

### Part Two: Identifying factors at the general practice level for coding 'decliner' and 'non responder'.

- Identify practices with 'high' and 'low' decline rates on the practice register:

Exclude those practices located in geographical areas where the population is known to have high anti-immunisation opinions.

Interview the selected practices to:

- Understand the local challenges that the populations of practices face with regards to the reasons given by parents/caregivers for declining immunisations; incompletely immunising or not responding to reminders to childhood immunisations.
- Identify the common systematic approaches taken at the general practices that leads to a child being coded as 'decline' in the electronic Practice Management Systems (PMS), including gathering information on (any) practice 'policy' on declines and the use of 'decline forms'.
- Identify the reasons why some practices have high percentages of children coded in the practice's electronic Practice Management Systems (PMS) with an outcome code of "decline".

- Compare the perceived local challenges, the use of the Practice Management System and the processes at the practice with high “decline” rates, with practices in a similar geographical location which have low “decline” rates, for childhood immunisations.
- Identify the common systematic approaches taken at the general practice that leads to a child being coded as ‘non-responder’ in the electronic Practice Management Systems (PMS).
- Identify the perceived local challenges and identified problems for ‘non-responder’ for childhood immunisations.
- Identify in what situations the codes ‘decline’ and ‘non-responder’ are used for the infants and children who are not enrolled (i.e. with the local PHO).
- Identify in what situations children are not immunised due to an identified medical contraindication.

**Part Three: Mapping patterns of general practices with higher rates of their registered population coded as declining immunisation events.**

Develop a series of maps using geocoding to identify geographical regions with high decline rates (greater than, or equal to, twice the national average for any of the milestone ages 6 months, 8 months, 12 months or 24 months) and low decline rates (less than, or equal to, half the national average of any of these milestone ages, for childhood immunisations.

## **METHODS**

### **Part One**

A retrospective cohort study that included all NZ children who turned two years old between 01 January 2010 and 31 December 2013 and were enrolled on the National Immunisation Register (NIR). Children whose parents elected to have their information opted off the NIR were excluded. Also excluded were children who died prior to their second birthday; children with a record of any vaccine given overseas and; children with inexplicable or erroneous information.

The data sources were the National Immunisation Register (NIR) and encrypted National Health Index (NHI) numbers. The measures were based on receipt of the national immunisation schedule events at 6 weeks, 3 months, 5 months and 15 months of age. Outcome measures were non-immunised, partially immunised, incompletely immunised and declined. Analysis was comparing these outcome measures by age, gender, prioritised ethnicity, region of residence and level of socioeconomic deprivation.

### **Part Two**

This was a comparative descriptive study involving undertaking structured interviews with key staff at general practices purposefully selected for having high rates of “decline” for children aged from 6 weeks to two years of age and same number of comparator practices in a similar geographical location purposely selected for having low rates of “decline”. High rates of decliner was defined as those that had greater than, or equal to twice the national average rate for a 3 month period ending 31 March for the milestone ages of 6 months, 8 months, 12 months, and 24 months. Practices in geographical areas which were identified to consistently have high decline rates were excluded and

practice with small numbers of children. The interviewees were the main Practice Nurse(s) from each practice who are actively involved in vaccination and entering data on the PMS system for the immunisation event, and data collection included a pre-visit questionnaire and a face-to-face structured interview lasting up to an hour.

### Part Three

NIR data was used to define general practices with high decline rates, defined as being greater than two times the national average, and general practices with zero decline rates. This data was used to map by DHB areas using geocoding for the milestone ages of 8 and 24 months of age.

## RESULTS

### Part One

There were 274,242 children enrolled on the NIR who turned two years of age between 2010 and 2013. A total of 10% were excluded from the study population, the largest group of whom were excluded because they had received at least one vaccine overseas ( $n=19,171$ , 7%), followed by those who had ever had their information opted off the NIR ( $n=6,957$ , 3%). The remaining 246,517 children available for analysis were fairly evenly distributed across gender (49% female vs. 51% male), but unevenly distributed across prioritised ethnicity with 53% European, 24% Māori, 11% Pacific, 10% Asian and 2% of other ethnicity. The majority of children in the analysis population resided in the Northern and Midland regions (60% combined) and half (50%) lived in the two most socioeconomically deprived quintiles (NZDep 7-10).

There was a large increase in immunisation coverage between 2010 and 2011, from 58% to 86% fully immunised, respectively ( $P < 0.001$ ), followed by a much smaller but still statistically significant increase through 2013 when 87% of children were fully immunised.

Among those fully immunised, just over half (53%) were European and 23% were Māori. A larger portion of fully immunised children were Pacific and Asian compared to those unimmunised. Europeans were less prevalent among partially immunised children (40%) compared to unimmunised and fully immunised children. Māori and Pacific ethnicities were more prevalent, making up 32% and 14% of the partially immunised children, respectively. The distribution of unimmunised children was dominated by European ethnicity (60%), followed by Māori ethnicity (25%). Compared to unimmunised and fully immunised children, the distribution of partially immunised children was skewed towards those who lived in the Northern Region of New Zealand (45%) and to those who lived in the most socioeconomically deprived areas (57% in NZDep 7-10).

The portions of selectively versus incompletely immunised children differed over time. Among children who turned two years of age in 2010, 31% and 69% were selectively and incompletely immunised, respectively. In 2011 the distribution reversed with 70% and 30% selectively and incompletely immunised, respectively. Over the period 2010 to 2013, there was a statistically significant increasing trend, with 31% and 73% selectively immunised, respectively. A corresponding decreasing pattern ensued for children incompletely immunised.

Incompletely immunised children were different from selectively immunised children with respect to ethnicity, region of residence and socioeconomic deprivation (all  $P < 0.002$ ). Compared to selectively



immunised children, incompletely immunised children were more likely to be Māori (35% vs. 31%) and Pacific (15% vs. 14%) and less likely to be European (39% vs. 41%), Asian (8% vs. 11%) and other ethnicities (2% vs. 3%). Incompletely immunised children were more likely to live in the Northern and Southern regions of NZ (69% vs. 59% combined) and in the two most deprived socioeconomic deciles (39% vs. 33% in NZDep 9-10).

Māori children were 14% (RR=1.14; 95% CI: 1.03, 1.27) more likely to be incompletely versus selectively immunised compared to European children. Asian children and children classified as other ethnicities were 22% (RR=0.78; 95% CI: 0.66, 0.92) and 38% (RR=0.62; 95% CI: 0.45, 0.87) less likely to be incompletely immunised compared to European children. Likewise, compared to children who lived in the Northern region of NZ, those who lived in the Midland and Central regions were 0.64 (95% CI: 0.56, 0.73) and 0.83 (95% CI: 0.74, 0.95) times as likely to be incompletely immunised, regardless of ethnicity or socioeconomic status. Children from NZDep of 3 or 4 being 16% (RR=1.16; 95% CI: 1.00, 1.35) more likely to be incompletely immunised compared to the least deprived children.

For selective immunisation the most frequent vaccine combination not received was MMR II together with Act-HIB (n=2,977; 68%) followed by MMR II alone (n=656, 15%) then Act-HIB alone (n=337, 8%).

Among the decreasing number of unimmunised children over time, the recording of 'decline' status has become more frequent, with the portion of unimmunised children who had at least one 'decline' record in the NIR increasing from 54% in 2010 to 73% in 2013. There was no consistent pattern with regard to socioeconomic status.

Similar patterns were seen when looking at the age cut off at eight and six months. The one difference between the age-specific patterns was the distribution of ethnicity among partially immunised children, where for the eight month age cut-off the proportion of Māori was higher than the proportion of European children.

The relative sizes of the selectively and incompletely immunised groups were reversed comparing children who turned two years of age to children who completed eight months of age in 2013. Only ethnicity and socioeconomic deprivation were independently associated with being incompletely immunised at the eight month age cut-off. At eight months European ethnicity dominated selectively immunised children (76%), but made up only 31% of incompletely immunised children. Compared to selectively immunised children, incompletely immunised children were more likely to be Māori (42% vs. 16%), Pacific (15% vs. 3%), Asian (11% vs. 4%) and other ethnicities (2% vs. 1%). Among the 252 selectively immunised children who completed their eighth month in 2013, 28 (11%) did not receive Infanrix-Hexa and 224 (89%) did not receive PCV.

## Part Two

In total 35 practice interviews were conducted; 21 practice interviews were completed for practices with a high decline rate and 14 practice interviews were completed for the 'comparator' practices with a low decline rate. Findings were grouped thematically into three parts:

### 1. Localised reasons for declining vaccinations

This section presents the participants' responses to structured questions about local challenges experienced by general practices, which contribute to parents declining immunisations for their children. This also incorporates information about selective, incomplete and delayed immunisations. The feeling among participants was that those who declined immunisations generally declined all immunisations and were "no from day one" (Low decline practice). Reasons were identified across both high and low declining practices and grouped into:

### Beliefs

#### *Natural lifestyle*

These included, firstly; the presence of particular communities within the practice population whose natural lifestyles were at odds with the immunisation programme. This was variously described as "going down the natural route" (High decline practice) and adopting a "natural, holistic approach" (Low decline practice) with parents likely to be well educated and having conducted their own research.

#### *Religious persuasion*

Second; religious persuasion was given as a reason for not immunising in several different localities. Various religions were cited including Brethren, Amish and Ratana communities, or parents were simply described as "church goers [from the] Bible belt" (High decline practice). Christian beliefs were mentioned as a contributing factor for parents declining the HPV vaccine because of "Mums' perception [that HPV vaccine is] aligned with sex" (Low decline practice).

#### *Lobbyists*

It was noted that the decline rate in some practices had been impacted by the influence of anti-immunisation lobbyists including influencing through coffee groups, practitioners influencing new Mums.

#### *Misinformation and own "research"*

Peer pressure via social media and coffee groups was referred to as a factor influencing the decision to decline immunisations. These mothers were described as intelligent, well-educated and having done their research, especially on the Internet, using "Dr Google". The Internet was frequently discussed as a research tool, with one participant blaming it for the negative information influencing parents' decision-making, saying "computers have done so much damage". Across all localities no single ethnicity emerged as being anti-immunisation

### Anxiety

At a more general level, fear of particular vaccines was commonly discussed as a reason for declining immunisations, choosing to selectively immunise or delay immunisations. Most frequently mentioned was the MMR vaccine. Family and friends were frequently cited as influencing the decision to not vaccinate. Parents who choose to selectively immunise were cited as being afraid of "over-burdening" their child's immune system. In these instances they would choose to split immunisations or delay until they feel the child can cope.

Several participants noted that there appear to have been changes over time with those from the practices with lower decline rates, in particular, reporting they were having less conversations around vaccine hesitancy than they had been a few years back and they felt that the attitudes had shifted to it being less socially acceptable in many groups now to not immunise.

### Practical challenges

On a practical level, transiency, the Christchurch earthquake, living remotely and to a lesser extent a lack of transport were given as reasons for children not being immunised. However, most of the study participants said that the follow up undertaken by OIS mitigated many of the practical problems.

In general, across all of the practices, parents who delayed immunisation or incompletely immunised their children were treated as overdue and kept in the system for follow up rather than being coded as declines in the Practice Management System.

## 2. Practice Procedures associated with coding a decliner.

Similar numbers of high decline practices compared to low decline practices had a decline policy. However, there was a large difference between practices in terms of those who used an actual decline form. In total 52% of high decline practices said that they used a decline form, compared to only 28% of LOW decline practices. Overall however, high and low decline practices appeared to follow similar procedures with regard to recording declines in their Practice Management System.

Most participants said they made several attempts (usually at least 3 documented contacts) to talk about immunisations with parents and that conversations must be with the Nurse or Doctor as opposed to the receptionist or practice manager. While the participants appeared willing to expend a great deal of effort in talking to parents about immunisation, and chasing overdue patients, time and cost challenges were noted.

Participants consistently raised the point that there needed to be prior evidence, “a paper trail”, of discussion attempts and the offer of information to parents before recording a decline by parent outcome. Most practices have an “open door” policy whereby parents are always given the opportunity to change their minds. All practices use the outreach service to assist with immunisations.

## 3. Practitioner issues associated with decliners

### Experience

Of note was that many of the practitioners in the practices with low decline rates had been in the role in the practice for a substantial amount of time. Many for more than seven years with one being in the role for 20 years, and the majority were mothers themselves.

### Recording a non-immunised as due to medical contraindications

Identifying a contra-indication to receiving a vaccine as a reason for not vaccinating children was not common in any of the practices, including those with high decline rates.

### Use of the code ‘Non-Responder’

The responses to the questions about non-responders were consistent across both HIGH and LOW decline practices. The Non-Responder code is rarely, if ever, used in most practices.

### Part Three

Geomaps are presented in the appendices to the report identifying general practices with high rates of decline and those with no decliners in their registered population. It can be seen that practices vary with a mixture of those with high and low decliners across the whole country, with some areas of clustering.

## DISCUSSION

The proportion of children fully immunised increased over time for each of the three target ages. The proportion of children unimmunised decreased only slightly over time for each of the three target ages, making the majority of children who added to the increasing proportions of fully immunised children those who had previously been partially immunised. This, together with the fact that the absolute number of partially immunised children is larger than the number of unimmunised children, suggests that the most efficient method for reaching current immunisation targets is to focus vaccine uptake on the partially immunised rather than unimmunised children.

At the younger age cut points, few children (between 3% and 6% in 2013) were selectively immunised. Rather, most children (between 93% and 97% in 2013) incompletely immunised, had received one or two doses of Infanrix-Hexa and PCV but were not completing the three-dose series recommended in the NIS. This supports getting children, who begin the primary vaccine series, to finish all doses in that series as the most efficient method for reaching current immunisation coverage targets. However; at the older age cut point, the pattern of selective versus incomplete immunisation is reversed. At two years of age, 27% were incompletely immunised, meaning the largest pool of children (73%) were selectively immunised. In order to make large gains towards coverage targets at this age cut point, the focus need to be on selectively rather than incompletely immunised children. In particular, the focus needs to be on ensuring children receive MMR II and Act-HIB.

In the case of wanting to make gains amongst incompletely immunised children at the eight month age cut point, focus should be on non-European children because they are between 11% and 13% more likely to be incompletely versus selectively immunised compared to European children, regardless of their gender, region of residence and socioeconomic status.

Alternatively, in the case of wanting to make gains amongst selectively immunised children at the two year age cut point, focus should be on children who reside in the Midland and Central region of NZ because they are 56% and 20% more likely, respectively, to be selectively versus incompletely immunised regardless of their gender, ethnicity and socioeconomic status.

Summarising this data, when formulating strategies to increase immunisation coverage, consider where the greatest gains in absolute numbers will lie: For two year olds, the selectively immunised have over twice the number of children compared to incompletely immunised, whereas for 8 month olds there are much higher numbers in the incompletely immunised group. Therefore, strategies that focus on the selective immunisers for the older group and for the incompletely immunised for the younger groups are likely to have the greatest gains towards achieving the national targets.

This is a unique study – few countries collect and record immunisation data at a level granular enough to produce the detailed characterisation of immunisation coverage that we have reported here. Detailed information about the children not yet fully immunised can be used to meet existing immunisation targets more efficiently by guiding new policy and tailoring interventions. Of course, the most utility will come from up-to-date data. We therefore recommend that future MoH immunisation coverage reports incorporate the detailed breakdowns we have illustrated in our study.

Part two of this study identified some important findings at the practice level. Firstly; while this study was designed to identify differences between practices that have high rates of ‘decliner’ versus low rates of ‘decliner’, it was notable that for many issues, all practices were taking a similar systematic approach with practice procedures. This included active and regular precall and recall, similar use of the Practice Management System for coding of ‘decliner’, avoidance of the use of the code ‘non-responder’ and a stated commitment by all to the importance of face-to-face communication and documenting all contacts. The majority of practices do not accept or enter ‘decline’ without first ensuring direct fact-to-face contact and almost all have an ‘open door’ policy for parents to re-discuss, at any time, alongside using opportunistic moments to discuss the overdue vaccinations. All practices actively used outreach immunisation services to support their endeavours and saw important benefit in this service

Of note, was the recurrent theme identifying the significant and often unrecognised time commitment it takes to chase those who are overdue and engage in conversations with those who have vaccine hesitancy. There are both opportunity and financial implications of this for the practice.

There were a range of challenges for families identified as barriers to achieving immunisation. Many were related to transport although these were felt to be mitigated by outreach immunisation services. The other identified challenge was working parents having difficulties fitting in appointment times with practices not being open outside of work hours.

There was one, somewhat unexpected, difference between practices with high decline rates and those with low. While there was no differences in terms of practices who had a policy for ‘decliners’, many more of the practices with high rates of decline used an actual decline form, often with the parent/guardian’s signature. While this is a qualitative finding only, it does raise the possibility that use of ‘declination’ forms may not necessarily be the most useful approach at the practice level. Some of the practices noted the importance of keeping the dialogue open, having an ‘open door’ for conversations and using opportunistic moments to continue the discussion. It is possible that the use of forms could shut down the ongoing dialogue.

There were no clear differences in practice behaviour between high and low decline rate practices for coding medical contraindications as a reason not to vaccinate and overall this was rare.

It was positive to note that all the practices interviewed never, or very rarely, used the code ‘non-responder’ and all articulated the importance of repeatedly re-engaging with families to ensure all children had been offered services.

When asked to identify parent/caregiver reasons for vaccine hesitancy or declining vaccination, similar issues were identified by all practices interviewed in the study. Practices identified parental

and community beliefs as an important factor in vaccine hesitancy. This included communities within the practice population who had natural lifestyles that were seen to be at odds with the immunisation programme, or religious persuasion reasons. It was considered that there is less general community vaccine hesitancy than previously, and the issues are becoming more confined to identifiable populations and communities.

While all practices recognised members of their practice population with a divergent view on the role of immunisation with their lifestyle, there were differences in language usage by the practitioner interviewed and also practice environment – there may at times be less promotional material and more interest in natural remedies apparent in practices with higher decline rates. Both the confidence and knowledge of the healthcare professional is known to be as important, if not more important, than the parental issues. While there is no evidence of vaccine hesitancy amongst these interviewed health care professionals, the concerns from communities and individuals with higher vaccine hesitancy may also be influencing some providers resulting in less emphasis on promotion and evidence-based approaches to immunisation delivery.

Another important aspect of vaccine hesitancy identified in this study and frequently noted in the international research was the community influence of anti-immunisation ‘lobbyists’. These individuals and groups are seen to have particular local community influence in environments such as coffee groups, particularly influencing new mothers, at times combined with peer pressure.

The third very important area that creates vaccine hesitancy identified by all practices was a general sense of ‘fear’ around the side effect of vaccines, concerns over the child’s immune response, worries about vaccines being ‘untested’, often arising from media reporting or family and friend perceived experiences. These issues have been extensively researched and discussed in the literature. Most recently the World Health Organization Strategic Advisory Group of Experts on Immunisation (SAGE) established a working group that has published a useful frame for a model of determinants of vaccine hesitancy organised around three key domains: contextual influences, individual and group influences and vaccine and vaccination-specific influences. This is a useful way to frame the multiple challenges and responses needed to support parents and communities in making positive, active choices in immunisation decision-making. Particular communities may need specific targeting and suggestions have included targeting resources for settings such as early childcare centres in communities that have higher rates of vaccine hesitancy.

Using geomapping as a tool is limited by only being descriptive data but does give a guide for service planning at the DHB and PHO level, as to where to usefully start targeting local communities for further strategies.

## **CONCLUSIONS**

This study has identified that partial vaccination is the most significant problem in New Zealand’s efforts to achieve national targets. A clear direction emerges for formulating strategies to target specific market segments. To achieve targets for the primary infant immunisation course (i.e. achieving high coverage by 6 and 8 months of age), the greatest gains are likely to be made by focusing on the group who are partially immunised. These tend to be infants from more deprived

backgrounds, often Māori or Pacific ethnicity, where there are a range of practical barriers to the family getting to the general practice in a timely fashion. Strategies here need to focus on access to the practice such as availability of open hours, improving transport options and continuing to support effective transfer to OIS when other strategies have not succeeded. Many working mothers also find accessibility a challenge and strategies should include repeat reminders, and consideration given to broader options for places and times to immunise. To achieve targets for toddlers to complete the vaccination event at 15 months, there needs to be a focus on those who 'selectively' immunise. This is likely to be a different profile of children, more from the higher socioeconomic groups, more of NZ European origin and tend to have anxiety concerns around vaccine safety and fewer concerns around disease risk.

Most general practices are taking a similar approach to how they engage and communicate with vaccine hesitant families. There is recognition of particular groups that are more likely to be vaccine hesitant including those with beliefs about natural lifestyles that feel in conflict with immunisation and those with a range of religious beliefs. These are more likely to be in identifiable localities and small communities and less across the whole population. Some communities and identified groups, such as parent coffee groups, have particular influences that create fears and social pressure not to vaccinate. Separately from these identified local groups there are, across the whole population and not confined to any socioeconomic or ethnic group, parents/caregivers who express a range of anxieties including fear of vaccine side effects, media scares and anecdotal stories from families and friends that affect vaccination uptake. Healthcare provider education, health promotion strategies and media strategies need to take note of the recurrent themes and respond in a more nuanced way to the particular concerns of communities and individuals. There will need to be more local strategies engaging and responding to the particular concerns of specific communities and localities.

Very few of the identifiable reasons for high decline rates in a general practice are related to the practice systems. However, it is possible that the use of signed forms with those who choose to decline may be too rigid and actually end up creating higher decline rates. All practices strongly endorse the importance of time and resources into the face-to-face communications, building and maintaining relationships and using multiple opportunities to enable ongoing communication and dialogue. Current practice funding mechanisms and time resourcing for front line staff may not be adequately recognising this and further research on this is recommended.

Finally, supporting the role of the front line practitioner, who is almost universally the Practice Nurse, is a key priority. New Zealand has an excellent, committed and well educated Practice Nurse population. Strategies and resources that support the confidence and engagement of the Practice Nurse and other front line healthcare professionals remains the highest priority. Alongside this there needs to be further strategies to support other key influences in our communities such as early child care staff and environments with a specific focus on those localities that have high rates of vaccine hesitancy.