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# New Zealand mothers' knowledge of and attitudes towards immunisation

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## ABSTRACT

### Aim

To identify parental knowledge and concerns about immunisation.

### Method

A random walk methodology was used to identify households containing mothers of young children willing to participate in the survey. This sample pool was supplemented from a database of similar households.

### Results

There were 500 participants from national urban areas. It was found that one in eight of all mothers interviewed were not convinced that vaccination prevents disease, or that measles can be a severe disease. Furthermore there

is a high level of misconception about the cause, transmission and prevention of disease. Other significant findings were that immunisation is not always routinely discussed by Lead Maternity Caregivers (LMCs) especially withholder mothers.

### Implications/Conclusion

The results of this survey indicate that the low level of confidence among urban New Zealand mothers over vaccination may be in itself sufficient to prevent New Zealand's target vaccine uptake rate of 95% from being achieved.

### Key Words

Immunisation, attitudes

(*NZFP 2002; 29: 240–246*)

## Background

Since 1990 considerable declines in morbidity internationally have been reported for the nine vaccine-preventable diseases for which vaccination of children has been recommended. Morbidity associated with smallpox and polio caused by wild-type viruses has declined by 100% and nearly 100% for each of the other seven diseases: Pertussis, Diphtheria, Haemophilus Influenzae B, Measles, Mumps, Rubella and Hepatitis B.<sup>1</sup> The

paradox is that the diseases no longer serve as a reminder of the need for immunisation and in their relative absence parents are becoming increasingly focused on the adverse reactions sometimes associated with the vaccines.<sup>2–6</sup> Immunisation may become undervalued by virtue of its own success.

For immunisation programmes to be fully effective they must maintain uniform coverage levels of over 85–95%. In New Zealand the 1992 na-

tional coverage survey found less than 60% of children were fully immunised by the age of two years.<sup>7</sup> A repeat coverage survey in 1996 in the Northern region found a small improvement, with an overall coverage rate of 63% at the age of two years.<sup>8</sup> There have been no clear improvements since that time<sup>9</sup> and controlled high quality research has not been conducted. The 1996 survey shows that the uptake of immunisation by Pacific Island populations

was lower (53%) than Pakeha/European and that of Māori was the lowest at 44.6% by the age of two years. These coverage rates are well below the targets of 95% immunisation coverage of all New Zealand children in 2000, set by the Ministry of Health in 1995.<sup>10</sup>

Parental knowledge of vaccination and the diseases that vaccines protect against is an important determinant in the decision to vaccinate their child.<sup>3,5,11,12</sup> Concerns about vaccines, even without scientific support, have the potential to erode the public's confidence and support for the immunisation programme. The low vaccine uptake in NZ has resulted in outbreaks of preventable disease. Measles epidemics continue (last in 1997) and NZ is currently experiencing a whooping cough epidemic. Internationally, poor confidence in the pertussis vaccine during the 1980s led to epidemics of whooping cough in many Western countries.<sup>13</sup>

Results of the Regional Immunisation Coverage Surveys from all Area Health Boards, in consultation with the New Zealand Communicable Disease Centre, in 1992 found that in general, caregivers throughout the country expressed a desire for more information from vaccination providers regarding immunisations. Depending on region, 2%–8% of caregivers felt that immunisations were not important.<sup>10</sup> In 1996 this sentiment was held by 3.7%–10% of caregivers, depending on region.<sup>8</sup> Concerns have been expressed that lack of confidence in vaccination may be a growing problem and contributing to the ongoing low coverage rates.

To better understand the knowledge, attitudes and misconceptions of parents about vaccines and vaccine preventable diseases, a telephone survey of parents of young children was undertaken. As a key time to inform parents about vaccination is in the antenatal period, we also investigated whether or not the parents had found the information given to them antenatally adequate to make an in-

Table 1. Demographic characteristics of participants

Sample	%	Sample size N=500
<b>Age</b>		
Under 20 Years	1	5
20–24 Years	11	55
25–29 Years	25	125
30–34 Years	38	190
35–39 Years	20	100
40 plus Years	5	25
<b>Region</b>		
Auckland	39	195
Wellington	14	70
Other North Island	27	135
Christchurch	10	50
Other South Island	8	40
<b>Ethnicity</b>		
European	69	345
Māori	9	45
Pacific Island	7	35
Asian	2	10
Indian	3	15
Other	9	45
Refused	–	–
<b>Joint Income</b>		
Under \$20 000	9	45
\$20 000 – \$30 000	13	65
\$30 001 – \$40 000	14	70
\$40 001 – \$50 000	13	65
\$50 001 – \$70 000	14	70
\$70 001 – \$100 000	13	65
\$100 000 plus	7	35
Refused	17	85
<b>Education Level</b>		
Primary	–	–
Secondary	45	225
Technical/Trade certificate/Teachers Certificate	24	120
University Degree or Professional Qualification	30	150
Some other level of education	1	5
<b>TOTAL</b>	<b>100</b>	<b>500</b>

formed decision about immunising their child.

### Methodology

A telephone survey was commissioned from NFO CM Research (National Family Opinion; Central Market Research), a leading market research consultant in New Zealand. The sample size of 500 New Zealand mothers with a child in their household younger than, or up to 18-months of age would be expected to enable an accurate range of views and enable inclusion of at least some members of a variety of ethnic groups.

Potential respondents were identified by two methods. The first method was used to conduct continuous face-to-face surveys in 16 main urban areas. A random walk methodology was conducted over 50 weekends a year. When conducting door-to-door surveys the researchers will go to a representative sample of a city's streets using maps (streets considered too dangerous for an interviewer are excluded).

An interviewer will go to their designated street and start from an address marked on the map, knocking on each consecutive door. If there is no answer they will try again later. If the time is inconvenient but an appointment is procured they will return later. If a refusal, they will move on to the next address. When they complete six interviews it is termed

'a cluster of six'. The cluster is pre-designated but always small. Once this is completed they move into another area and another map. When they return to the area for another survey they will start interviewing at the point they finished previously. This approach ensures a good cross representation of respondents.

Using this method, households containing mothers of young children were identified to be telephoned for this survey. This sample pool was supplemented from a database where the required respondent had been interviewed for a previous survey and had given permission to recontact them.

A standardised interview schedule was developed based on a large UK survey that highlighted areas where parents lacked understanding.<sup>11</sup> Questions gauging knowledge and attitudes were centred about disease severity, efficacy of vaccines and disease transmission. Parents were asked where they obtained their information about immunisation and how they felt about the information they had received. Quantitative and qualitative comments were sought.

The survey was carried out between the 18<sup>th</sup> April and 11<sup>th</sup> May 2000 encompassing national urban areas.

### Statistical analysis

Sample error for prevalence estimates has a maximum of 4.4% expressed at a 95% confidence level.

The Chi Square statistic was used to test for differences between subgroups. Data handling and analysis was done using Surveycraft and Epi Info 2000.

### Results

A total of 1 266 households were approached and 818 fitted the inclusion criteria. Of these, 61% completed interviews. The 318 who did not participate in interviews could be classified as the following: Appointment not completed n=7, unobtainable n=274 and refusal n=37. Table 1 shows the demographic characteristics of the sample surveyed.

Lead Maternity Carers (LMC) reported by a survey of New Zealand mothers

Sixty-two per cent of mothers used a midwife as their primary carer during their last pregnancy, 45% of these respondents identified their lead maternity carer as an independent Midwife (Table 2). Only 12% of Europeans used a midwife from a hospital compared with 37% of NZ Māori. The use of a specialist increased with age, with 42% of women over 40 using a specialist.

Of those who did recall receiving information on immunisation, 289 (58%) received it from their LMC.

Table 3 shows responses of mothers to specific statements about immunisation. Answers to the statements covered a spectrum from strongly agree, somewhat agree, neither/nor, somewhat disagree to strongly disagree and don't know.

### Subgroup comparisons

Examining responses with respect to LMC status of the mother showed that:

- Respondents who used a midwife as their LMC were less likely to perceive measles as serious to children compared to those who saw a doctor (84% compared to

Questions gauging knowledge and attitudes were centred about disease severity, efficacy of vaccines and disease transmission

Table 2. Breakdown of Lead Maternity Caregivers used by participants

LMC type	Total %
Midwife Independent	45 (n=225)
Midwife Hospital	17 (n=85)
Doctor or GP	20 (n=100)
Specialist/Obstetrician/Gynaecologist	18 (n=90)

Table 3. Summary of agreement with statements made to mothers in New Zealand about immunisation

	Strongly Agree %	Somewhat Agree %	Total Agree %	Neither/ Nor %	Somewhat Disagree %	Strongly Disagree %	Total Disagree %	Don't Know %
Measles can be a serious disease for young children.	67	20	87	3	5	2	7	3
Vaccines are generally effective at preventing these diseases.	62	26	88	2	4	3	7	2
If you keep children clean, well fed and otherwise healthy they will not catch these diseases.	8	10	19	4	24	52	76	1
Breastfeeding stops children from catching these diseases.	8	18	27	6	30	32	62	5
Parents and caregivers have a responsibility to ensure children are immunised to prevent these diseases from spreading in the community.	78	11	90	3	2	4	6	1
Whooping-cough is <b>not</b> a serious disease for young children.	6	3	10	1	6	81	87	2
General immunisation of children helps to protect those children who cannot be immunised themselves due to illness.	48	25	73	4	7	8	15	7
Childhood diseases are no longer around much so you don't have to worry about immunising against them.	4	4	8	2	15	75	89	1

92% respectively) Chi square 4.74 (df 1),  $P = <0.029$ .

- Those who utilised midwives were more likely to agree that breastfeeding stops children from catching these diseases (30% who saw a midwife compared to 23% who saw a doctor or specialist). Chi Square 4.74 df 1.  $P < .03$ .
- The perception that childhood diseases are no longer around so you don't have to immunise against them any longer was more likely to be held by those mothers who saw a midwife than

by those who saw a doctor (10% compared to 4%). Chi-Square 4.36, df 1,  $P < 0.04$ .

Examining responses by age group of the respondent

*'Vaccines are generally effective at preventing these diseases'*

Mothers over 40 were less likely to agree that vaccines are effective, the mean rate of agreement for this statement was 88%, but only 71% of the over 40 age group agreed ( $c2 = 7.29$ ,  $P = 0.015$  [fisher exact]).

*'Parents and carers have a responsibility to ensure children are immunised to stop these diseases spreading to the community'*

The mean rate of agreement with this statement among all age groups was 90% however for mothers over 40 there was only 71% agreement ( $c2 = 7.217$ ,  $P = <0.007$ ).

*'General immunisation of children helps protect those children who cannot be immunised due to illness'*

Twenty-nine per cent of mothers over 40 disagreed with this statement

compared with an average of 14% among other groups. (Yates corrected  $c^2 = 6.02$ , 1 tailed fisher  $P = 0.013$ )

*'If you keep children clean, well fed and otherwise healthy they will not catch these diseases'*

Mothers over 40 were less likely than younger groups to agree with this statement. Under 24, 32%; 25–29 years, 17%; 30–34 years, 19%; 35–39 years, 17%; and over 40 years, 4% ( $c^2$  for linear trend 5.045,  $P = 0.025$ ).

Examining responses by ethnicity

*'Breastfeeding stops children from catching these diseases, such as whooping cough and measles.'*

Ethnic groups other than European and Māori were more likely to agree with this statement; 24% compared to 47% ( $c^2 = 20.71$   $p < 0.05$ ).

*'If you keep children clean, well fed and otherwise healthy they will not catch these diseases.'*

There was wide variation in responses between ethnic groups to this statement. Thirteen per cent of Europeans agreed, 26% Māori, 45% Pacific Island, 58% Asian, 40% Indian and 22% Other ( $c^2 = 4.29$ ,  $P < 0.05$ ).

*'Childhood diseases are no longer around much so you do not have to worry about immunising against them.'*

Pacific Island (33%) and Asian (33%) mothers were most likely to agree with this statement. European (4%), Māori (11%), Indian (0%) and Other (9%) were less likely to agree.  $c^2 = 7.2$ ,  $P = 0.0074$

Lead Maternal Caregivers and immunisation information

Mothers were asked who discussed immunisation with them during or soon after their last pregnancy and where, if anywhere, did they get in-

formation for their child. Of those who saw a midwife as their LMC, 61% recalled discussing immunisation. Of those who saw a general practitioner, 81% recalled immunisation being discussed and of those who saw a specialist, only 20% said they discussed immunisation with them (Chi-square 73.61, 2df  $P < 0.000$ ). Comparing only those who saw a general practitioner with those who saw a midwife showed that recall was higher in the doctor group (yates corrected chi-square 12.72,  $P < 0.0036$ ). Of the respondents who did not discuss immunisation with a midwife, GP or specialist (19% or 96 respondents) but who obtained information from another source, 53% used Plunket. There were 115 (23%) who recalled receiving no information on immunisation.

When asked whether they received verbal or written information, 20% of mothers recall receiving no written information. Over 90% of mothers under 24 and over 40 years of age obtained some sort of written information compared to 75% of mothers between 25 and 39 years. Around 20% of those between 25 and 39 years say they received information only verbally, more than in other groups, ( $P = 0.066$  Chi-Square 3.36).

Twenty-two per cent said only the benefits of immunisation were communicated while 21% said potential risks were also mentioned. The remaining key information related to being told about the range of diseases that children can be immunised against, the schedule of administration, and the decision to immunise being the parental choice.

Overall, as a result of what they had been told, the general feelings of the respondents towards immunisation were positive, reinforcing its importance and enabling mothers to make an informed choice. Seventy

## Key points

- Parental knowledge of vaccination and the diseases that vaccines protect against is an important determinant in the decision to vaccinate their child.
- One in eight of all mothers interviewed were not convinced that vaccination prevents disease, or that measles can be a severe disease.
- Immunisation is not being routinely discussed by Lead Maternity Carers, especially specialists and midwives.

per cent of mothers agreed that they had received enough information to make an informed decision. This was especially high among mothers under 24-years-old; 93% felt they had received enough information about immunisation.

Respondents were polarised about the focus of the information they were given. Forty-three per cent agreed that there was too much focus on the good things about immunisation and not enough on the possible bad things; 48% disagreed.

Just over a third of respondents agreed that the information they received was informative but that they still needed more advice or guidance. Twenty-one per cent felt that there was an element of coercion delivered with the information, feeling that information givers tried to persuade them to have their child immunised. Despite this feeling, very few (6%) felt that this was in any way unfair. The majority felt that the decision was still left with them.

Those mothers with a midwife compared with those attending a general practitioner as their LMC were more likely to say that the information was confusing – 14% compared to 4% respectively (Yates corrected  $c^2 = 4.97$ ,  $P = 0.026$ ) – and less likely

It is possible that mothers immunise more readily with first time pregnancies, but have doubts with subsequent pregnancies

to say they had had enough information for them to make a decision (83% compared to 90% of those who saw a general practitioner).

#### Decision to immunise

When asked whether or not they immunised their child 19% of the 500 participants declined to answer. Of the 81% who did respond, 95% said yes and 5% said no. The question did not differentiate between those who were fully immunised and those who had begun immunisations but not continued with the programme.

#### Discussion

The objective of this survey was to establish the general knowledge and attitudes of parents about disease and vaccinations. The survey also established information gained antenatally and investigated whether there were differences in knowledge base related to the main maternity caregiver, the respondent's age and ethnicity.

The findings show that the majority of respondents believe immunisation to be an important way to protect children against serious disease, 88% felt vaccines are generally effective. However, what is of significant concern is that 12% of respondents felt otherwise which, if acted upon by not immunising children, in itself precludes an ability to reach New Zealand immunisation uptake target of 95% set by the Ministry of Health. These attitudes alone would form a barrier to achieving target coverage rates even before the addition of other issues such as contraindications and access to services.

Parents without telephones, those of minority ethnic groups and those on low incomes are under represented in this sample (Dept Statistics 97/98). A sizeable minority declined to answer whether their children were immunised or not. Non-immunisers are potentially among the non-respondents to this survey. This lim-

its the generalisability of the results. Having taken this into account, the mainstream of parents, utilising primary health care services during pregnancy are represented here and this information itself is valuable and surprising, especially as educational levels were high in this group with 30% having a tertiary qualification.

Although there was a very small number of mothers over the age of 40 years (n=24) they were not only least likely to consider measles to be serious but also least likely to consider vaccines effective. Older first time parents may be more questioning and less convinced of the medical model, or parents who didn't question with earlier children but became more concerned with later pregnancies.

It is concerning that about one quarter of respondents thought that breastfeeding and hygiene would prevent these diseases (27% and 19%) respectively. This demonstrates a high level of misunderstanding

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# Spinal Publications

about what causes vaccine preventable disease, its transmittance and the process of vaccination.

Parents appear to have little understanding about the concept of herd immunity and the protection it offers to those who cannot be immunised or to those individuals who fail to seroconvert to the vaccine. Despite the findings to these questions there was still a strong sense of responsibility toward other members of the community although this is possibly in conflict with other attitudes in this survey such as vaccine confidence and the perceived severity of disease. This is an area that could be explored in future surveys.

This survey suggests immunisation is not being discussed by many specialists and levels of information offered by midwives can be improved. It would be of interest to know whether the omission of immunisation discussion was in part because it was not considered nec-

essary in cases of multiparity, where carers are assumed to be already aware of immunisation issues. The fact that mothers under 24 years were considerably more likely to have received written information than older mothers is indicative of this. It is possible that mothers immunise more readily with first time pregnancies, but have doubts with subsequent pregnancies. There is some anecdotal evidence for this being the case (Immunisation Advisory Centre 0800 help line). Antenatal maternity caregivers need to be more aware of multiparous women's immunisation information needs, and not assume they have a confident and unchanging understanding of immunisation.

#### Conclusions

In too many cases immunisation is not being routinely discussed by Lead Maternity Carers, especially specialists and midwives. It appears

likely that older mothers and those of multiparity are especially overlooked.

Nearly one in eight mothers are not convinced that immunisation prevents disease, nor that measles is a serious disease. A lack of conviction from inadequate information, poor knowledge of the science of immunisation, and poor understanding of the diseases may be contributing to these findings. Educational intervention with LMCs may be appropriate and it is important to follow up mothers at each WellChild check or other opportunity to discuss any concerns they may be experiencing.

The level of lack of confidence over vaccination may be sufficient to prevent the target vaccine uptake rate of 95% set by the Ministry of health in 1995.

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