



Attitudes to immunisation: a survey of health professionals in the Rotorua District

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Abstract

Aim To examine the personal attitudes and practice of health professionals regarding childhood vaccinations in order to provide guidance to local professional education strategies.

Methods A questionnaire was circulated to those involved in the implementation of the childhood immunisation schedule in the Rotorua District. Responses were stratified: a) community vs hospital; b) nurses, midwives, doctors, others.

Results 85% responded, of whom 94% supported vaccinations. 91% considered science the most important basis for recommendations; 91% considered current scientific support adequate. 11% thought immunisations held unacceptable dangers; 17% were unsure. 41% of nurses, 45% of midwives, and 21% of doctors were unsure whether the MMR vaccine was associated with autism or Crohn's disease. Professional training, reading and personal experience were identified most often as having an influence on opinions, while the media and Internet ranked least often. Amongst respondents who had children, 96% reported vaccination (no significant difference between professional groups, but lower rates for children of hospital providers).

Conclusions Strong notional support of vaccinations was demonstrated in this survey of professionals involved with vaccination in one district. Significant underlying uncertainties or concerns were identified regarding risks, the MMR vaccine, and ethical tensions between community protection and perceived individual risk. Continuing education and dialogue through professional training and medical literature are indicated to address these concerns.

Delivery of scheduled immunisations, from discussion with families to the administration of vaccines, involves a wide range of health and allied professionals from differing backgrounds.

Previous studies have investigated causal factors of low immunisation rates.¹⁻³ A key finding from these studies is that the attitudes and practice of healthcare providers may be more important as a determinant of immunisation rates than patient-related variables such as levels of maternal education, socioeconomic status or parental immunisation beliefs. A number of studies focussing on doctors have reviewed the knowledge base of professionals regarding immunisations, tested understanding of the contraindications and assessed immunisation policy application at the primary care level.⁴⁻⁶ Wood et al concluded that the characteristics of the medical provider were more closely related to coverage rates than were the attributes of the family and child.⁷

The wider team integral to the delivery of immunisation in New Zealand, however, includes nurses (hospital, practice, public health and Plunket), midwives, Maori health workers and Tipu Ora Kaitiaki, as well as doctors. This survey was developed on the premise that the attitudes of all these health professionals have significant bearing on immunisation coverage as the family look to the professionals they know for advice and guidance regarding vaccination of their child.⁸ The investigation was prompted by anecdotal evidence of uncertainty or differing opinions amongst some health professionals involved in the promotion or administration of scheduled childhood vaccinations. Coincidentally, when this questionnaire was released locally, a national newspaper headlined concerns raised by the Ministry of Health about professionals presenting differing views on the vaccination of children.⁹ The purpose of our study was to assess the level of uncertainty that existed and amongst whom in the Rotorua region, so that educational needs could be aptly addressed and appropriate dialogue continued.

Methods

A paper-based questionnaire was designed to specifically explore the attitudes of health professionals involved in the promotion and administration of scheduled childhood immunisations (Table 1).

Table 1. Questionnaire designed to explore attitudes of health professionals to immunisation

Personal information
<ul style="list-style-type: none"> • Your age category: ['15–24yrs', '26–35yrs', '36–45yrs', '46–55yrs', '56 and over'] • Your gender: ['M', 'F'] • Your professional category: ['Public Health Nurse', 'Tipu Ora Kaitiaki', 'Plunket Nurse', 'Hospital Nurse', 'Hospital Doctor', 'Midwife', 'Practice Nurse', 'General Practitioner'] • In the course of your paid work, which of the following activities are you involved in? ['Promoting and advising on immunisations', 'Giving immunisations to children', 'Organising supply of immunisations']
Attitudinal statements (Likert scale)
Q1. Immunisations for children should be strongly recommended to the family Q2. Current recommendations for immunisation have good scientific support Q3. Immunisations have unacceptable dangers Q4. A small risk to the individual in order to protect the community is appropriate Q5. Media coverage of possible vaccination problems has changed my attitude Q6. I think that MMR is implicated as a cause of autism and/or Crohn's disease Q7. Quality scientific research is the most important basis for immunisation recommendations
Basis of attitudes
<ul style="list-style-type: none"> • Your attitudes to immunisation of children are based on: ['Family attitudes', 'Internet', 'Media', 'Personal Experience', 'Reading', 'Professional training', 'Religious philosophical belief', 'Work colleagues', 'Other'] • Do you have religious or philosophical reservations about immunisation? ['Yes', 'No']
Immunisation of own children
<ul style="list-style-type: none"> • Do you have children of your own? ['Yes', 'No'] • If you do have children, then have you had them vaccinated? ['Yes', 'No'] • If your child(ren) has/have not been vaccinated, was that by deliberate choice?

Demographic data, including the respondent's professional role, were requested in order to stratify by zone ('hospital' or 'community') and job type ('nurse', 'doctor', 'midwife' or 'other'). Attitudinal statements were used to test opinions regarding the importance of recommending vaccinations to families (Q1), the degree and importance of scientific support (Q2, Q7), the role of the media in

influencing attitude (Q5), perceived dangers (Q3, Q6) and some ethical dilemmas regards the risk to the individual versus the benefit to the community (Q4). These were structured with the Likert response scale from 'strongly disagree' to 'strongly agree' (scored from 1 to 5 for analysis). Further sections surveyed factors the respondent perceived as influencing their attitudes and vaccination of their own children where relevant. The questionnaire was pre-tested outside the Rotorua District, and the study discussed with the regional ethical committee.

A listing was compiled of all the groups involved locally with implementing the childhood immunisation schedule and the questionnaire was distributed through coordinators in each sector. Surveys were sent out on 24 June 2002, with responses accepted until 30 July 2002. Reminders were sent to non-responders after one month. Respondent anonymity was maintained for analysis.

Results were tabulated on Microsoft Excel[®]. The chi-square statistics method was used to assess differences in responses between various subgroups surveyed. Comparisons were made between 'hospital' and 'community' workers and between 'doctors', 'nurses', and 'midwives'. In this second stratification, there was a small group of 'other' child health providers comprising primarily Tipu Ora Kaitiaki (Family Start services). As there were only seven responders (out of a possible nine) these data were excluded from statistical group comparisons. Where respondents indicated more than one field of activity (eg, LMC midwives working both independently and for the district health board) default was made to the area of prime employment.

Results

The response rate was 85%, and the breakdown by professional role is outlined in Table 2. There were 144 female and 44 male respondents. Only one of the males was not a doctor. The age distribution stacked by professional group is shown in Figure 1.

Figure 1. Age distribution of questionnaire respondents stacked by professional grouping

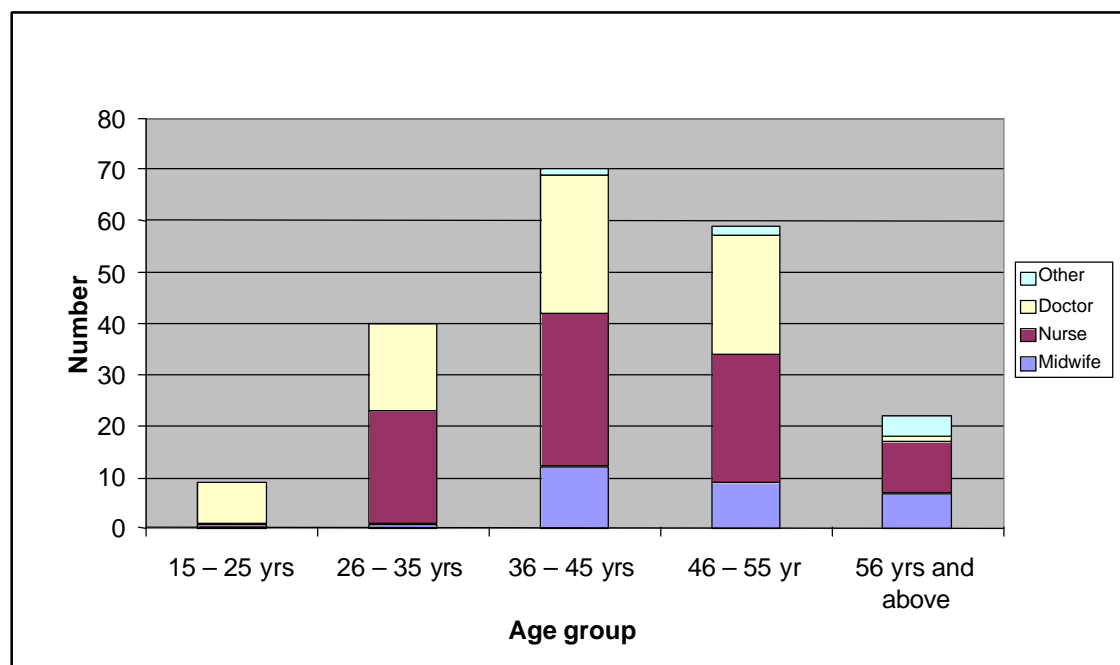


Table 2. Response rates of child healthcare providers to questionnaire

Professional role	Number in category	Number of responses	Number of non-responders	Percentage of responders
Public health nurse	6	6	0	100
Tipu Ora Kaitiaki	9	7	2	78
Plunket nurse	11	10	1	91
Hospital nurse	33	27	6	82
Hospital doctor	39	28	11	72
Midwife	36	29	7	81
Practice nurse	50	45	5	90
General practitioner	52	48	4	92
Total	236	200	36	85

A greater proportion of community-based participants were involved in promotion, giving, and organising supply of vaccines compared with hospital-based participants (Table 3).

Table 3. Vaccine-related activities of questionnaire respondents by professional group

	Community n = 122		Hospital n = 78	
	n	%	n	%
Promoting and advising on immunisations	113	93	53	68
Giving immunisations to children	75	61	30	38
Organising supply of vaccinations	40	33	5	6

NB: multiple responses allowed

Responses to attitudinal statements

Responses stratified by workplace (community or hospital) and by job type (midwives, nurses, doctors, other), and analysed with the chi-square statistic demonstrated significant differences across the strata for a number of the attitudinal statements (Table 4).

Table 4. Attitudinal responses by stratified groups

Grouping (n)	All (200)	C (122)	H (78)		MW (29)	N (88)	D (76)		Other (7)
Attitudinal statement	Mean			p value	Mean			p value	Mean
Immunisations for children should be strongly recommended to the family	4.7	4.8	4.5	0.0033	4.2	4.6	4.9	0.0002	4.7
Current recommendations for immunisation have good scientific support	4.4	4.5	4.2	0.0189	4.1	4.3	4.7	<0.0001	4.1
Immunisations have unacceptable dangers	2.1	2.0	2.2	0.3846	2.7	2.2	1.5	<0.0001	3.3
A small risk to the individual in order to protect the community is appropriate	3.8	3.8	3.7	0.2815	3.6	3.6	4.0	0.1316	4.3
Media coverage of possible vaccination problems has changed my attitude	2.2	2.2	2.1	0.3734	2.0	2.4	2.0	0.0002	2.9
I think that MMR is implicated as a cause of autism and/or Crohn's disease	2.2	2.1	2.4	0.0028	2.5	2.3	1.8	0.0028	3.0
Quality scientific research is the most important basis for immunisation recommendations	4.5	4.6	4.4	0.0451	4.4	4.5	4.7	0.0451	3.9

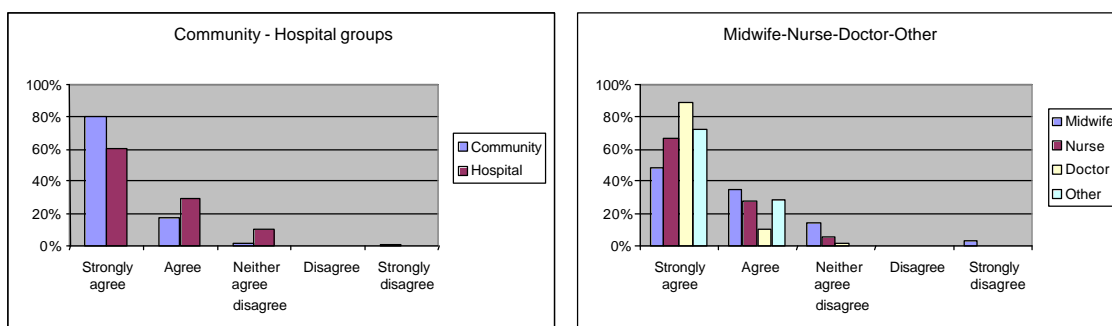
NB: responses were scored 1 to 5 ('strongly disagree' to 'strongly agree') and mean scores then assessed by group. P values were calculated using the chi-square statistic.

C = Community; H = Hospital; MW = Midwives; N = Nurses; D = Doctors

Immunisations for children should be strongly recommended to the family (Figure 2)

Ninety five per cent of respondents (189/200) supported this statement. Community providers more often answered 'strongly agree' than hospital workers ($p = 0.003$). Eight of the 10 uncertain respondents were hospital providers. Ninety nine per cent of doctors (75/76) responded 'agree' or 'strongly agree'.

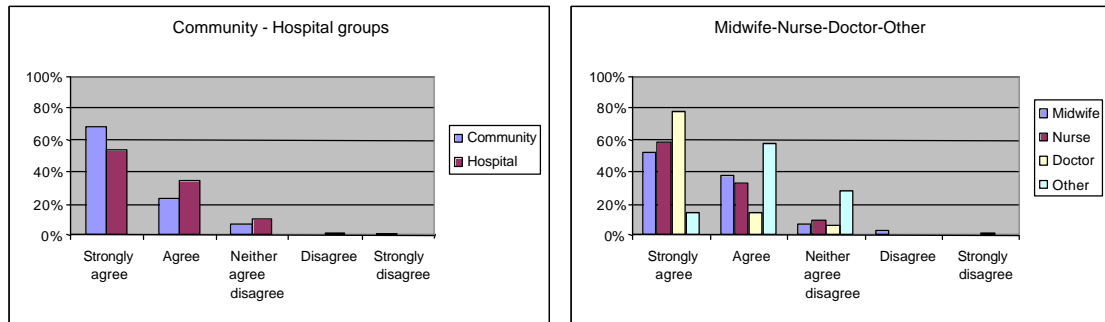
Figure 2. Responses to statement: 'Immunisations for children should be strongly recommended to the family'



Quality scientific research is the most important basis for immunisation recommendations (Figure 3)

This statement drew strong support, with 91% agreeing (181/200). Six per cent (12/200) were uncertain, and 3% disagreed (5/200, all five hospital providers). Seventy eight per cent of doctors responded 'strongly agree' (59/76).

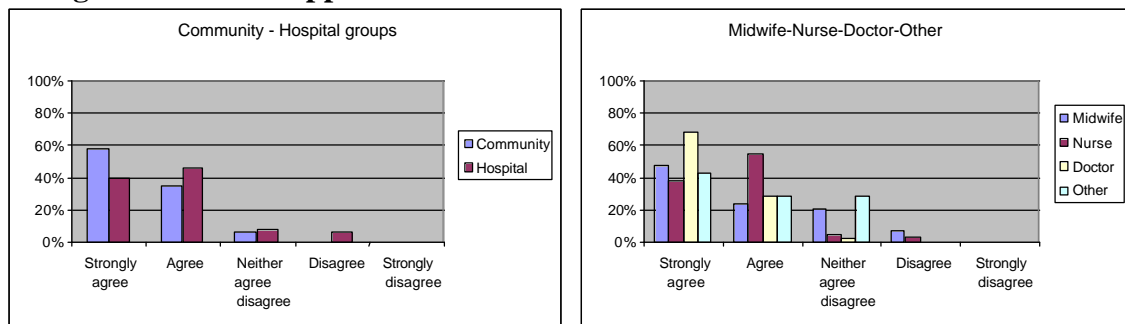
Figure 3. Responses to statement: 'Quality scientific research is the most important basis for immunisation recommendations'



Current recommendations for immunisation have good scientific support (Figure 4)

Ninety one per cent (181/200) responded 'agree' or 'strongly agree' to this statement. The other 9% were made up of 14 respondents who neither agreed nor disagreed, and five who disagreed. More community providers agreed with the statement than hospital providers ($p = 0.02$).

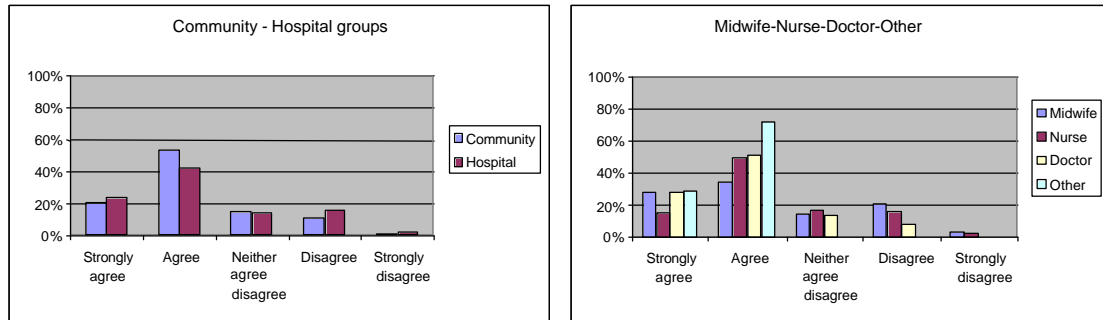
Figure 4. Responses to statement: 'Current recommendations for immunisation have good scientific support'



A small risk to the individual in order to protect the community is appropriate (Figure 5)

This statement, reflecting on personal ethics, drew positive support with 71% (142/200) agreeing or strongly agreeing. However, 15% (29/200) were uncertain and 15% (29/200) disagreed with the statement. Differences between professional groups were not statistically significant.

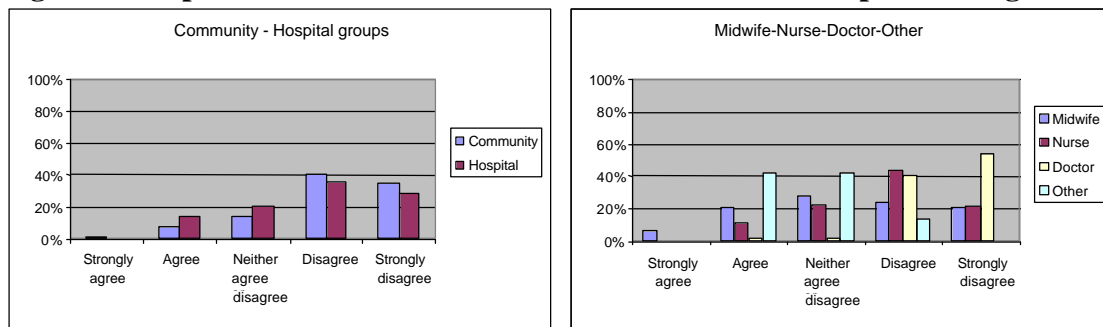
Figure 5. Responses to statement: ‘A small risk to the individual in order to protect the community is appropriate’



Immunisations have unacceptable dangers (Figure 6)

Seventy two per cent (144/200) disagreed, but 17% (33/200) neither agreed nor disagreed, and 11% (23/200) thought that there were unacceptable dangers (‘agreed’ or ‘strongly agreed’). Comparing hospital and community groups, there was not a significant difference ($p = 0.38$). However, amongst professional groups, 80% of nurses and doctors disagreed or strongly disagreed (130/162), whereas the distribution of midwives’ responses was scattered, with 45% (13/29) disagreeing, 28% (8/29) uncertain, and 28% (8/29) agreeing with the statement. This difference with the opinions of nurses and doctors was statistically significant ($p = 0.00001$).

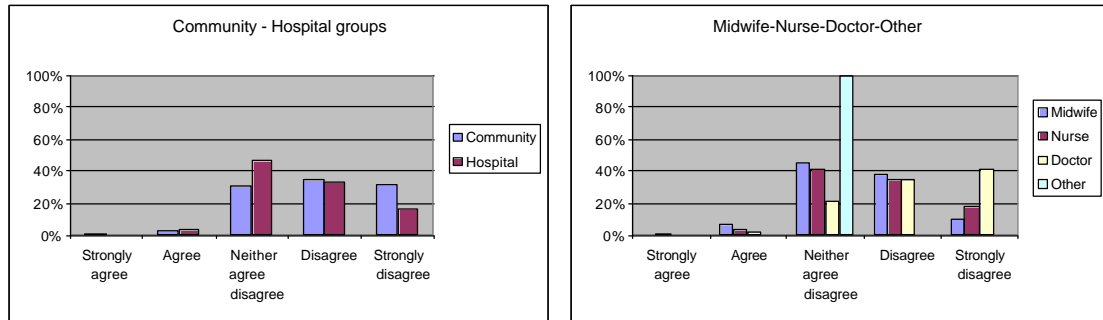
Figure 6. Responses to statement: ‘Immunisations have unacceptable dangers’



I think that MMR is implicated as a cause of autism and/or Crohn’s disease (Figure 7)

Responses to this statement reflected significant uncertainty, with 36% (73/200) choosing ‘neither agree nor disagree’. Forty six per cent of hospital providers (36/78) compared with 30% of community providers (37/122) responded ‘neither agree or disagree’; 41% (35/86) of nurses and 45% (13/29) of midwives were uncertain, compared with 21% of doctors ($p = 0.003$). Seven out of all the respondents considered the MMR vaccine to be implicated in these conditions (six agreed and one strongly agreed with the statement).

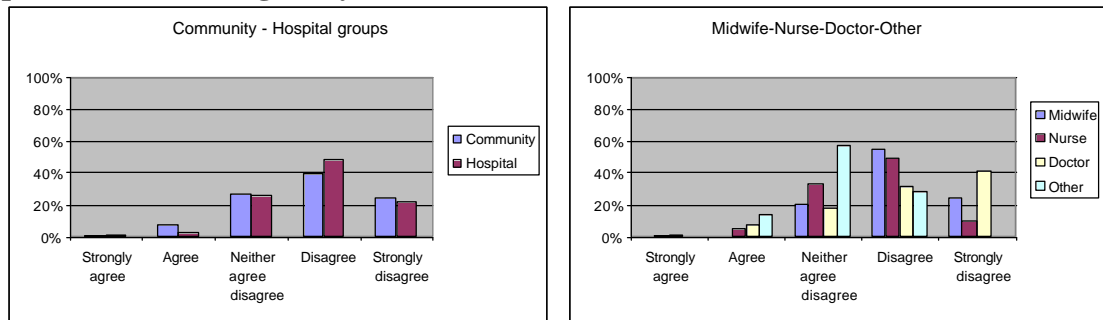
Figure 7. Responses to statement: ‘I think that MMR is implicated as a cause of autism and/or Crohn’s disease’



Media coverage of possible vaccination problems has changed my attitude (Figure 8)

Sixty seven per cent of all respondents (133/200) disagreed with this statement. Hospital and community provider response distributions were similar, but there was significant difference between professional groups, with more doctors disagreeing with the statement than other groups ($p = 0.0002$).

Figure 8. Responses to statement: ‘Media coverage of possible vaccination problems has changed my attitude’

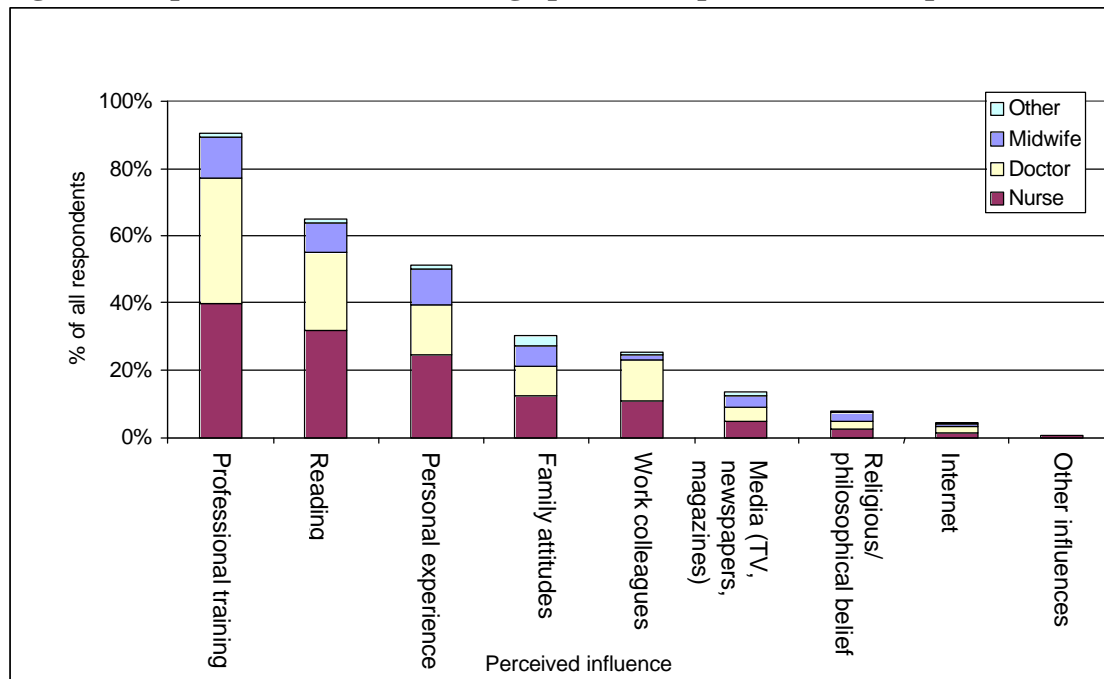


Personal immunisation practice

Respondents who indicated that they had children were asked whether or not their own children had been vaccinated. Eighty per cent of providers (160/200) had children and the self-reported vaccination rate was 96% (153/160). Differences in rates between professional groups did not reach statistical significance ($p = 0.14$). The vaccination rate reported for children of hospital providers (89%, 41/46) was, however, significantly lower than that for the community category (98%, 112/114, $p = 0.01$).

The majority of respondents identified ‘professional training’ (90%, 179/200) and ‘reading’ (65%, 129/200) as influences on their attitudes. The Internet was noted by only 5% (9/200) as influential (Figure 9).

Figure 9. Reported factors influencing opinions of questionnaire respondents



Effect of age on attitudes

No significant variation of response to the statements across age strata was demonstrated using the chi-square statistic.

Discussion

The role of the health provider has been recognised as fundamental to the success of any vaccination programme.¹⁰ In this survey we reviewed the attitudes and personal family uptake of vaccinations amongst members of the immunisation delivery team for the Rotorua District. Published data from the 1990s have reported an immunisation rate of 92.14% for children aged 24–36 months enrolled with the Rotorua General Practice Group,¹¹ which services the majority of children in the Rotorua District. With a survey response rate of 85%, this survey is representative of opinion amongst providers for this district.

Our results demonstrated positive support that ‘immunisations should be recommended to the family’. The question ‘Do we practice what we teach?’ was asked by Sharkness et al, in their New Jersey study,¹² in which doctors’ knowledge correlated with coverage rates in their practices. In this survey, we also inquired about vaccination of providers’ own children. The high uptake amongst the respondents for their own children provided further evidence that giving childhood immunisations was supported. Self-reporting of uptake may overestimate the true rate and this study neither gave validation to the quoted rate nor assessed completeness for vaccination of the providers’ own children. Nonetheless, it reflected notional support. Further research would be required to explore the impression that positive attitudes of health professionals correlate with higher vaccination coverage rates.

Significant areas of uncertainty were identified. Hospital providers responded with less certainty regarding issues such as the importance of promoting vaccines and the

strength of existing scientific support. More community providers had direct involvement in implementing the schedule, and hence may have had more definite views. Arguably, however, hospital workers may have more often attended children suffering vaccine-preventable illnesses, which could be expected to galvanise opinion.

The statement 'immunisations have unacceptable dangers' drew a wide range of response. There was a significant and concerning proportion of respondents who thought the dangers unacceptable (11%) or who were not sure either way (17%). The number of health professionals indicating this level of anxiety regarding risks is of concern. A related statement tested views regarding risk to individuals versus protection of community. This drew a similar proportion disagreeing or unsure (29%). Clearly, the response to this question is largely influenced by knowledge and risk perception as well as the philosophical standpoint of the respondent. It may influence the way the health professional communicates with families about vaccinations.

Respondents indicated overall that quality scientific research was the most important basis for recommending vaccinations and considered current recommendations to be well supported. It was interesting, and a little surprising, then to note the general uncertainty about the MMR vaccine that exists amongst providers. A large number (36%) were not sure if MMR was implicated as a cause of autism and/or Crohns disease. This is in spite of literature^{13,14} (responding to the Wakefield paper¹⁵) reassuring the medical community about the safety of MMR vaccination. While this highlights a specific continuing education issue, it also emphasises the importance of quality science being clearly presented to the whole immunisation delivery team. Few thought they were influenced by the media (14%) and yet the MMR vaccine remains in question for many providers. One can only suspect that even for 'science-based' providers the general media are more influential than may be given credence. It is certainly easier to engender doubt than it is to restore confidence.

A strength of this study lies in its wide coverage of local providers. The counterpoint limitation is that it covers just one region in New Zealand. We should be cautious, therefore, about extrapolating these group comparisons to a broader context. The analysis by group did highlight some issues providing local focus for continuing professional education.

While differences did exist on the broad questions, there was fundamental support across the board for recommending vaccinations and confidence in their scientific basis. Midwives displayed a wide spectrum of responses to the statement that immunisations have unacceptable dangers. Significant numbers of nurses and the Maori health workers were either not sure or concerned about the level of danger. So even given the clear general support, there also existed underlying hesitations that need to be addressed to maintain professional leadership for community vaccination programmes.

It was observed that response patterns did not significantly differ by age. Variation in opinion related not to age of the provider, but to training and related experience. Respondents rated 'professional training', 'reading', and 'personal experience' most highly as shaping their opinions. The Internet was considered one of the least influential factors by professionals at this time. This suggests that most effective continuing education should be organised in collegial and work-based settings. These influences may be quite different to those for parents considering vaccination, where

the media and Internet sources may be more influential. Family attitudes may have greater sway amongst many, particularly in some cultural settings, but in this study ranked fourth amongst influences.

In conclusion, this study demonstrated positive attitudes to vaccination of children across the spectrum of professionals involved and a basic expectation that quality scientific research should be the basis of recommendations. There were, however, some areas of concern indicating that ongoing professional education is needed, particularly regarding vaccination risks. The New Zealand system places emphasis on the importance of the team. Midwives have a crucial role in the antenatal phase of parental decision making. General practitioners, practice nurses and Plunket nurses face the challenge of maintaining momentum to complete the schedule. Maori health workers, such as Tipu Ora, support the process with their specialised contribution to Maori and other families. Hospital providers have a role promoting vaccinations and opportunistic follow up of children in contact with hospital services. Public health nurses have influence in schools and communities. Through the multifaceted contact of a family with various members of this team, it remains important that the promotion of vaccinations is coherent and consistent. Underpinning this, all providers must sustain the relevant knowledge base and be convinced of the benefits themselves in order to provide the necessary leadership to support vaccination schedules.

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