HPV/cervical cancer vaccination: parental preferences on age, place and information needs

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ABSTRACT

INTRODUCTION: A vaccine against cervical cancer is available in New Zealand through school and primary care for girls aged 12–18 years. Factors that might increase or hinder widespread uptake by the target population need to be identified.

AIM: To describe parents' preferences on where their daughter(s) receive the human papillomavirus (HPV) vaccine, at what age, and their information needs.

METHODS: 3123 questionnaires were distributed to parents recruited from 14 schools in 2008, prior to the start of the school-based vaccination programme. Outcome measures were: preferred age and place of vaccination, and information needs of parents and their daughters. Tests for significance were performed to determine whether parental preferences differed by ethnic group (Maori, Pacific, New Zealand European and 'Other').

RESULTS: A 25% response rate was achieved (769/3123). Receipt of the HPV vaccine in a clinic setting was preferred by 40% of parents; 25% preferred vaccination at school. Fifty percent preferred vaccination to occur at age 13 or older; 28% thought ages 10, 11 or 12 appropriate. One in three parents wanted more information and 65% said they would seek information from their family doctor before deciding on the vaccine for their daughter(s).

DISCUSSION: We suggest that a programme delivered jointly in primary care and school settings, that is appropriately resourced for follow-up and information-sharing, would increase vaccine coverage. The rationale for vaccination at age 12 needs to be made clear to parents and evidence-based information needs to be delivered appropriately to parents and girls.

KEYWORDS: Human papillomavirus (HPV); vaccination; cervical cancer; survey; ethnicity.

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Introduction

Vaccines are now available to protect against infection with the human papillomaviruses (HPV) that play a causal role in the majority of cervical cancer cases. The quadrivalent Gardasil® vaccine chosen for the national vaccination programme protects against the two 'high-risk' types (16 and 18) that are responsible for 70% of cervical cancer worldwide,[1] and against two of the 'low-risk' HPV types (6 and 11) responsible for most cases of genital warts.[2] Achieving a high level of vaccination coverage of the eligible population is expected to reduce the incidence of cervical cancer and genital warts among New Zealand (NZ) women over time.

The Gardasil® vaccine is being administered free in NZ through both school and primary care settings. All District Health Board (DHB) areas are delivering the vaccine via a school-based programme, with the exception of Canterbury DHB where the programme is solely run through primary care. The vaccine has been available for girls born in 1990 and 1991 from primary care (including Maori or Pacific providers), youth health services, and other health settings since September 2008. The school-based programme

began at the start of the 2009 school year offering vaccination to girls in Year 8 and above (12 years up). Administration of the Gardasil® vaccine is recommended at an early age as younger girls mount a greater antibody response and therefore may be afforded better protection against the virus,[3] and vaccination prior to sexual debut ensures girls have not already been exposed to the virus.[4]

In NZ, Maori and Pacific women have the highest incidence of cervical cancer and a poorer prognosis once diagnosed.[5,6] Disparities have also been reported in access to both screening (breast and cervical) and immunisation for Maori and Pacific women.[5–7] The National HPV immunisation implementation plan therefore recognises Maori and Pacific as priority groups for vaccination, with additional funding provided to DHBs to address these priority groups.[8] To achieve high uptake, and to minimise the risk of increasing inequalities for both Maori and Pacific, we need an understanding of those factors that may increase, or conversely hinder, widespread coverage.

Studies have been conducted overseas to explore parental attitudes towards the new HPV/cervical cancer vaccine.[9–19] NZ research has explored parental views towards other childhood vaccines, and barriers to vaccination.[20–23] Place of vaccination is an important factor when considering access and uptake; the success of the MeNZB™ programme that was predominately school-based (for five- to 17-year-olds) played a role in the decision to deliver Gardasil® via schools, despite differences in the nature of the disease targeted by these vaccines.[8] Non-return of signed consent forms prohibits receipt of the vaccine. Analysis of data from one DHB region on receipt of the 11-year-old vaccine (diptheria/tetanus/whooping cough) showed that Maori were significantly less likely to return consent forms than non-Maori.[23] By contrast, consent form return rates were high for Maori in the MeNZB™ programme.[8]

The cervical cancer vaccine differs from others on the immunisation schedule in a number of important ways. For example, it targets an infection that is sexually transmitted and is most effective when administered prior to sexual onset, it reduces likelihood of developing a time-distant disease, and is currently only available for girls. Given the unique nature of this vaccine, we aimed to explore factors that might impact on uptake, including: parents' preferences on where their daughter(s) receive the vaccine and at what age; age-appropriate information for girls; information needed to assist parents with decision-making; parental contact regarding consent and information-sharing between school and primary care.

WHAT GAP THIS FILLS

What we already know: The HPV/cervical cancer vaccine has the potential to reduce current disparities in cervical cancer incidence for Maori and Pacific if high uptake is achieved. The vaccine will be delivered via a school-based programme in most areas of New Zealand to girls in Year 8 and above.

What this study adds: Parents indicated a preference for their daughters' receipt of the HPV/cervical cancer vaccine in primary care, and many would seek the views of their GP before making a decision about vaccination for their daughter(s). The rationale for vaccination at a young age needs to be explained clearly and information provided in a way that is accessible to parents from all backgrounds.

Methods

The study was approved by the Central Region Ethics Committee on 17 June 2008 (CEN/08/04/014). Surveys were distributed to schools in October and November in term 4 of the 2008 school year. Return of a completed survey signified a parent's consent to participate; surveys were received up until the end of January 2009. Questions were developed based on findings from key informant interviews conducted with parents, similar work conducted overseas and local attitudinal research on immunisation.[20–22] Surveys were piloted with 15 participants, and modified following feedback on clarity and ambiguity in question formatting.

Recruitment and distribution of surveys

Eligibility criteria for schools included: located in Wellington, more than 100 pupils (with the exception of one Kura Kaupapa Maori language immersion school that had fewer than 100 pupils), and attended by girls in Year 8 and above (intermediate and secondary schools). Schools

were stratified by decile rating into low (deciles 1–3), medium (deciles 4–7) and high (deciles 8–10). Schools with lower ratings had higher proportions of Maori and Pacific students so were oversampled to achieve good representation of priority groups. The decile rating of a school is an indicator of socioeconomic status of the population within the school-defined area, where children attending a decile 1 school are likely to be from a lower socioeconomic background than those attending a decile 10 school.[24] All eligible schools in the Wellington area with decile ratings between 1 and 5 were invited to participate. Schools with decile ratings of 6 and above were randomly chosen (using the Excel RAND function).

A letter of invitation was sent to the principal at 22 of 41 eligible schools (10 low, six medium and six high decile). Arrangements for administering the survey were made and a $50 book voucher given as a token of appreciation. Parents were eligible for participation if they had a daughter attending one of the participating schools.

Surveys (with a brochure about cervical cancer and the HPV vaccine)[25] were distributed in one of two ways, as nominated by the school: girls took the survey home to their parents (10 schools), or the school posted the survey to parents (four schools). For three high-decile schools with large rolls, we asked schools to distribute surveys to parents of only half their students. Surveys were returned directly to the researchers by freepost envelope (eight schools), or students returned surveys to the school with small incentives offered by the school (for example, entry into a draw to win vouchers) in an attempt to increase response rates. Reminder notices about completion and return of surveys were sent out by all schools in their newsletters and/or in daily notices. The research team did not send reminders to non-responders as contact details for parents were not obtained due to privacy reasons.

Data collection and analysis

Questionnaires collected demographic data and asked parents about their vaccination preferences with regards to age, venue and information needs, as well as the likelihood of seeking vaccination for their daughter(s). Ethnicity was collected using the 2001 NZ census question and was recoded to the following four groups: Maori, Pacific, New Zealand European (NZEu) and Other. Assignment was based on prioritised ethnicity.[26] 'Strongly agree' and 'agree' responses were pooled for analysis, as were 'strongly disagree' and 'disagree' responses. Comments made to open-ended questions were analysed for content and coded to allow for a frequency count (reason for preference on place of vaccination, format and content of further information if desired). Kruskal-Wallis tests followed by Wilcoxon pairwise comparisons were performed in situations where data could not be assumed to follow a normal distribution. For these pairwise comparisons, Bonferroni corrections were applied to control for Type I error resulting from multiple comparisons (significance level set at 0.05/n comparisons). Chi-square tests were performed to test for significant differences between categorical variables, and 95% confidence intervals calculated where appropriate. Statistical analyses were performed using SAS (v9.2).

Results

Fifteen of the 22 schools agreed to participate and, of those, 14 took part (six co-ed, two girls only, five intermediate and one full Kura Kaupapa Maori school) giving a population of 3123 girls in the age range. Five schools declined (all low decile) due to 'lack of time', two were undecided (one high- and one low-decile school) after several weeks so were not further pursued. The overall response rate from parents was 24.6% (769/3123). Co-education secondary schools had the lowest response rate (19.6%, 370/1889); followed by intermediate schools (30.5%, 215/704), the highest response rate was parents of girls at girls-only secondary schools (35%,182/520). Participating schools were spread across deciles, with a response rate of 18.7% from four low-decile schools (157/838), 24.4% from six medium-decile schools (380/1560) and 32% from four high-decile schools (232/725).

Table 1 presents the characteristics of participating parents who returned completed surveys (n=769), with *p*-values denoting significant overall differences between ethnic groups on demographic variables using chi-square tests for significance. Pairwise comparisons showed that Maori and Pacific parents were significantly more

likely to be younger (p<0.0001); have children attending lower decile schools (p<0.0001); have more than four children than parents of NZEu and 'Other' ethnicities (p<0.0001).

Preferred venue and age for receipt of Gardasil®

Table 2 presents data relating to parents' likelihood of seeking vaccination and preferences for where their daughter(s) receive the vaccine and at what age. Parents were significantly more likely to prefer vaccination in a clinical setting (39%, 95% CI 35.8–42.8) than at school (26%, 95% CI 22.6–28.9); p<0.05. This preference was greatest for Pacific parents, of whom 54% preferred a clinic and 10.5% preferred the school setting (p<0.05). Ten percent of Maori parents indicated a preference for receipt of the vaccine at a Maori health clinic (12/126), and 7% of Pacific parents preferred vaccination at a Pacific health clinic (4/57). Forty percent of participants provided reasons for their choice (302/769). Reasons given for a clinic preference included 'parental support and involvement' (20%, 23/113), 'confidentiality and privacy' (21%, 24/113), 'trust' (14%, 16/113), 'safety' (12%, 13/113), and 'continuity of care' (10%, 11/113). Reasons for a school preference included 'convenience' (45%, 44/98), and 'support from friends' (34%, 33/98).

Sixty-five percent (501/769) of survey respondents thought girls should receive the vaccine between the ages of 10 and 15 years, with 13% preferring vaccination at age 16 or older (102/769). Just over a quarter of parents (216/769) chose ages 10, 11 or 12. A Kruskall-Wallis test showed an overall difference in age preferences between ethnic groups (p<0.05). Pairwise comparisons showed that Maori parents were significantly more likely to select younger ages than parents of Pacific and 'Other' ethnicities (p<0.0083). NZEu parents were more likely to prefer younger ages at vaccination than parents of 'Other' ethnicities (p<0.0083), but did not differ significantly from Maori (p=0.01) or Pacific parents (p=0.03) when Bonferroni corrected p-values were used to determine statistical significance (0.05/6=0.0083).

Table 1. Characteristics of participating parents

Characteristics	All parents (n=769)		Maori (n=126)		Pacific (n=57)		NZEu (n=477)		'Other' (n=109)		P-value
	n	%	n	%	n	%	n	%	n	%	
Female	725	94.3	118	93.7	52	91.2	454	95.2	101	92.7	ns
Age-band											
30 and under	65	8.5	23	18.3	4	7.0	32	6.7	6	5.5	<0.05
35–44	354	46.0	68	54.0	33	57.9	198	41.5	55	50.5	
45–54	311	40.4	26	20.6	15	26.3	227	47.6	43	39.4	
55+	25	3.3	6	4.8	4	7.0	12	2.5	3	2.8	
Children (mean, SD)*	2.9	1.7	3.3	1.6	3.9	1.8	2.8	1.2	2.8	1.4	<0.05
Child at low decile school	157	20.4	42	33.3	21	36.8	80	16.8	14	12.8	<0.05
Tertiary educated	396	51.5	61	48.4	23	40.4	252	52.8	60	55.0	ns
Full-time employment	332	43.2	66	52.4	31	54.4	186	39.0	49	45.0	<0.05
Some religious affiliation†	419	54.5	54	42.9	48	84.2	243	50.9	74	67.9	<0.05
English is second language	108	14.0	5	4.0	39	68.4	5	1.0	59	54.1	<0.05
Children received all childhood vaccinations	686	89.2	112	88.9	49	86.0	435	91.2	90	82.6	<0.05
Concern about past reactions to vaccination	82	10.7	6	4.8	2	3.5	61	12.8	13	11.9	<0.05

* Includes children in responders care (e.g. relatives' children, foster children)
† Christian or 'Other' (Buddhist, Hindu, Muslim, Jewish)

Table 2. Likelihood of seeking vaccination for daughter and preferred venue and age at receipt of vaccination

	Total (n=769)	Maori (n=126)	Pacific (n=57)	NZEu (n=477)	'Other' (n=109)
	n % (95% CI)	n % (95% CI)	n % (95% CI)	n % (95% CI)	n % (95% CI)
Want daughter to receive HPV vaccine	514 66.8 (63.4 – 70.2)	84 66.7 (57.7 – 74.8)	36 63.2 (49.3 - 75.6)	323 67.7 (63.3 – 71.9)	71 65.1 (55.4 – 74.0)
Preferred venue					
Clinic*	302 39.3 (35.8 – 42.8)	55 43.7 (34.8 – 52.8)	31 54.4 (40.7 – 67.6)	179 37.5 (33.2 – 42.0)	37 33.9 (25.1 – 43.6)
School	197 25.6 (22.6 – 28.9)	28 22.2 (15.3 – 30.5)	6 10.5 (4.0 – 21.5)	135 28.3 (24.3 – 32.6)	28 25.7 (17.8 – 34.9)
Clinic or school	89 11.6 (9.4 – 14.0)	17 13.5 (8.1 – 20.7)	5 8.8 (2.9 – 19.3)	56 11.7 (9.0 – 15.0)	11 10.1 (5.1 – 17.3)
Her choice	156 20.3 (17.5 – 23.3)	21 16.7 (10.6 – 24.3)	10 17.5 (8.7 – 29.9)	98 20.5 (17.0 – 24.5)	27 24.8 (17.0 – 34.0)
No preference / Not having it	16 2.1 (1.2 – 3.4)	2 1.6 (0.2 – 5.6)	3 5.3 (1.1 – 14.6)	8 1.7 (0.7 – 3.3)	3 2.8 (0.6 – 7.8)
Preferred age					
Never	22 2.9 (1.8 – 4.3)	1 0.8 (0.0 – 4.3)	4 7 (1.9 – 17.0)	12 2.5 (1.3 – 4.4)	5 4.6 (1.5 – 10.4)
Not sure	131 17 (14.4 – 19.9)	21 16.7 (10.6 – 24.3)	15 26.3 (15.5 – 39.7)	74 15.5 (12.4 – 19.1)	21 19.3 (12.3 – 27.9)
Median age (Interquartile range)	13 (12 – 15)	13 (12 – 14)	14 (13 – 15)	13 (12 – 15)	15 (12.3 – 16)
Age 10 years	25 3.3	12 9.5	2 3.5	11 2.3	0 0
Age 11 years	24 3.1	7 5.6	1 1.8	11 2.3	5 4.6
Age 12 years	167 21.7	31 24.6	5 8.8	115 24.1	16 14.7
Age 13 years	121 15.7	18 14.3	5 8.8	89 18.7	9 8.3
Age 14 years	88 11.4	15 11.9	7 12.3	59 12.4	7 6.4
Age 15 years	76 9.9	9 7.1	9 15.8	42 8.8	16 14.7
Age 16 or older	102 13.3	12 9.5	7 12.3	54 11.3	29 26.6

* Includes GP or nurse clinic, Maori and Pacific health clinics

Non-return of consent forms and information-sharing

The majority of parents (87%) were happy to be phoned if they had not returned a consent form (672/769). Few parents (8%) answered 'no' to being phoned (63/769) and only 3% were unsure. Maori (13%) and Pacific (14%) parents had a slightly higher proportion of 'no' responses than NZEu (5.7%) parents (p<0.01). The majority of parents indicated they would be happy for their daughter's GP to be informed about receipt of the vaccine at school (717/769, 93%), 3% said no (24/769), and 2% (18/769) were unsure, with no differences observed by ethnic group.

Information for girls and parents

Parents were asked about what should be discussed with girls aged 12–15 and aged 16 and older (Table 3). The majority of parents thought all information would be appropriate for both age groups (i.e. answered 'yes' to statements for both age groups). Some types of information were deemed by a small number of parents to be appropriate for discussion with the older but not the

younger girls (causes and risks of cervical cancer, how HPV is passed on, abstinence, possible side effects of the vaccine, genital warts and STIs).

Table 4 presents data relating to parents' desire for more information (other than the Ministry of Health brochure provided) to assist with decision-making about the vaccine. Three-quarters of these parents (77%) responded to an open-ended question about the type of information they would want (184/236). Responses included: information on side effects and risks (39/184); efficacy and long-term effects of vaccination (38/184); evidence-based research and scientific information (37/184); and safety (31/184). A few parents also noted they would want 'unbiased' information, details about vaccine contents, updated information about the programme, and information on whether a booster is needed at five years.

Discussion

Parents indicated a greater preference for delivery of the Gardasil® vaccine in clinic rather than school settings. Reasons for clinic-based vaccination were, most frequently, that it would allow for continuity of care (from the family GP), enable parental involvement and the opportunity for parents to provide comfort and support to their daughter. Given that the HPV vaccination programme will be run predominantly through schools, enabling girls to have whanau/family support on vaccination day at school might be beneficial. Parents also need to be encouraged to seek vaccination for their daughter(s) through primary care if that is their preference. Convenience was cited as a key reason for preferring school-based delivery. In a previous study, parents expressed a preference for delivery of childhood immunisations (meningococcal disease and measles) in general practice, with the exception of Pacific parents who preferred school-based delivery[20]—a finding that differs from the current study.

Just over a quarter of parents (28%) thought ages 10–12 appropriate for receipt of the vaccine. Parents of Pacific and 'Other' ethnicities were more likely to indicate a preference for older age at re-

Table 3. Information deemed appropriate for girls when discussing the HPV vaccine

What should be discussed with girls aged 12–15, and girls aged 16 and older?*	'Yes' responses presented by age group							
	Both age groups		16 years and older only		12 to 15 years only		Neither age group	
Topic (n responding to question)	n	% (95% CI)	n	% (95% CI)	n	% (95% CI)	n	% (95% CI)
Cervical cancer—causes and risks (645)	615	95.3 (93.4 – 96.8)	28	4.3 (2.9 – 6.2)	1	0.2 (0.0 – 0.9)	1	0.2 (0.0 – 0.9)
HPV: What it is and how it's passed on (during sexual contact) (637)	587	92.2 (89.8 – 94.1)	47	7.4 (5.5 – 9.7)	2	0.3 (0.0 – 1.1)	1	0.2 (0.0 – 0.9)
Cervical screening and pap smears (629)	545	86.6 (83.7 – 89.2)	78	12.4 (9.9 – 15.2)	1	0.2 (0.0 – 0.9)	5	0.8 (0.3 – 1.8)
Practising safe sex (629)	545	86.6 (83.7 – 89.2)	78	12.4 (9.9 – 15.2)	1	0.2 (0.0 – 0.9)	5	0.8 (0.3 – 1.8)
Not having sex (628)	490	78 (74.6 – 81.2)	26	4.1 (2.7 – 6.0)	42	6.7 (4.9 – 8.9)	69	11 (8.6 – 13.7)
Possible side effects of the vaccine (640)	603	94.2 (92.1 – 95.9)	27	4.2 (2.8 – 6.1)	2	0.3 (0.0 – 1.1)	8	1.3 (0.5 – 2.4)
Genital warts and STIs (630)	559	86.7 (86.0 – 91.1)	53	8.2 (6.4 – 10.9)	2	0.3 (0.0 – 1.1)	16	2.5 (1.5 – 4.1)

* Respondents were asked to answer for both age groups. A number of parents responded only for the age group in which their daughter fell, so their responses are not recorded here to avoid skewing of the data.

Table 4. Desire for more information to assist decision about vaccination

Information needs	Total (n=769) n % (95% CI)	Maori (n=126) n % (95% CI)	Pacific (n=57) n % (95% CI)	NZEu (n=477) n % (95% CI)	Other (n=109) n % (95% CI)	P-value*
Want more information before deciding on HPV vaccination						ns
Yes	236 30.7 (27.4 – 34.1)	34 27 (19.5 – 35.6)	25 43.9 (30.7 – 57.6)	141 29.6 (25.5 – 33.9)	36 33 (24.3 – 42.7)	
No	405 52.7 (49.1 – 56.2)	64 50.8 (41.7 – 59.8)	22 38.6 (26.0 – 52.4)	263 55.1 (50.5 – 59.7)	56 51.4 (41.6 – 61.1)	
Don't know	94 12.2 (10 – 14.7)	21 16.7 (10.6 – 24.3)	7 12.3 (5.1 – 23.7)	52 10.9 (8.2 – 14.0)	14 12.8 (7.2 – 20.6)	
Would seek other's views about the vaccine						ns
Yes	582 75.7 (72.5 – 78.7)	96 76.2 (67.8 – 83.3)	47 82.5 (70.1 – 91.3)	358 75.1 (70.9 – 78.9)	81 74.3 (65.1 – 82.2)	
No	137 17.8 (15.2 – 20.7)	19 15.1 (9.3 – 22.5)	4 7 (1.9 – 17.0)	96 20.1 (16.6 – 24.0)	18 16.5 (10.1 – 24.8)	
Don't know	41 5.3 (3.9 – 7.2)	7 5.6 (2.3 – 11.1)	3 5.3 (1.1 – 14.6)	22 4.6 (2.9 – 6.9)	9 8.3 (3.8 – 15.1)	
If Yes, would seek views of:						
Extended family/whanau	231 39.7 (26.8 – 33.4)	48 50 (39.6 – 60.4)	18 38.3 (24.5 – 53.6)	143 39.9 (34.8 – 45.2)	22 27.2 (17.9 – 38.2)	<0.05
Daughter(s)	217 37.3 (25.1 – 31.5)	33 34.4 (25.0 – 44.8)	19 40.4 (26.4 – 55.7)	142 39.7 (34.6 – 44.9)	23 28.4 (18.9 – 39.5)	ns
Friends	222 38.1 (25.7 – 32.2)	40 41.7 (31.7 – 52.2)	12 25.5 (13.9 – 40.3)	152 42.5 (37.3 – 47.8)	18 22.2 (13.7 – 32.8)	<0.05
Teachers	47 8.1 (4.5 – 8.0)	13 13.5 (7.4 – 22.0)	8 17 (7.6 – 30.8)	20 5.6 (3.4 – 8.5)	6 7.4 (2.8 – 15.4)	<0.05
Family doctor (GP)	503 86.4 (61.9 – 68.8)	86 89.6 (81.7 – 94.9)	43 91.5 (79.6 – 97.6)	308 86 (82.0 – 89.5)	66 81.5 (71.3 – 89.2)	ns
School or public health nurse	201 34.5 (23.1 – 29.4)	44 45.8 (35.6 – 56.3)	22 46.8 (32.1 – 61.9)	106 29.6 (24.9 – 34.6)	29 35.8 (25.4 – 47.2)	<0.05
Community leaders	17 2.9 (1.3 – 3.5)	6 6.3 (2.3 – 13.1)	4 8.5 (2.4 – 20.4)	5 1.4 (0.5 – 3.2)	2 2.5 (0.3 – 8.6)	<0.05
Church/spiritual leader	31 5.3 (2.8 – 5.7)	7 7.3 (3.0 – 14.4)	8 17 (7.6 – 30.8)	13 3.6 (1.9 – 6.1)	3 3.7 (0.8 – 10.4)	<0.05
Information in own language would be helpful†	37 34.3 (3.4 – 6.6)	1 20 (0.5 – 71.6)	21 53.8 (37.2 – 69.9)	2 40 (5.3 – 85.3)	13 22 (12.3 – 34.7)	<0.05

* Denotes *p*-value for Kruskal-Wallis test for significant differences between ethnic groups on each question presented here. Results of Wilcoxon pairwise comparisons are described in results section.

† Question asked of those with English is a second language (108 in total, 5 Maori, 39 Pacific, 5 NZEu, 59 Other)

ceipt of the vaccine. This might reflect characteristics of parents in these groups; they were more likely to be immigrants (over 50% have English as a second language), and have a religious affiliation so might have different views on the appropriate age for vaccination. A recent NZ study reported that practice nurses would be more likely to recommend the vaccine to girls aged 16–26 (than to younger girls), and that GPs would most likely recommend the vaccine to girls aged 13–15 years old, followed closely by 9–12-year-olds.[27] In the current programme, the vaccine will be offered to girls in Year 8 (girls aged 12), therefore careful explanation will be needed for parents (and health providers) to understand the important reasons for vaccination at this age.

The majority of parents deemed information relating to HPV vaccination (presented in Table 3) suitable for girls of all vaccine-eligible ages. Cervical screening and pap smears, practising safe sex, genital warts and STIs were thought to be appropriate for discussion only with girls aged 16 and older by 8–12% of parents. A third of parents wanted more information about Gardasil® before making a decision about vaccination, and many indicated that they would seek the views of others—most commonly those of the family doctor (GP). A telephone survey of 1052 parents conducted in 2009 also showed the GP/nurse/medical centre was the preferred place to get information on the vaccine.[28] As with other vaccines, health professionals' endorsement and support of the HPV vaccine will be important to ensure the success of this programme. Henniger's survey showed that GPs and practice nurses indicated a high level of willingness to recommend the vaccine to their patients.[27]

With parental or patient permission, receipt of the HPV vaccine will be recorded on the National Immunisation Register (NIR), and authorised health professionals will be able to access this information. Parents in this study were happy for information-sharing to occur between the NIR and primary care, stating that it was important that their daughter's GP receive this information for their records. However, it appears that GPs/health providers are not routinely notified when their patients receive Gardasil® at school, but can request information on their patients' vaccination status. This lack of information-sharing will potentially limit opportunities for vaccination.

Parents were also happy to be phoned if they had not returned a consent form to enable their daughter's receipt of the vaccine. Resources to follow-up on consent forms will be particularly important in schools or areas known to have low return rates of (any) school-related paperwork from parents. The mass communication campaign, integrated information systems (schools and primary care) and the resources to support recall and follow-up have been cited as key to the success of the MeNZB™ programme. Our findings support the view of Grant et al. who advocated for an integrated system to enable all opportunities for immunisation with Gardasil® to be utilised,[29] with vaccine administration and information-sharing between primary care and education providers.

This is the first NZ study to describe parents' preferences on where and when their daughters' receive the Gardasil® vaccine. The inclusion of groups most at-risk for cervical cancer (Maori, Pacific and lower socioeconomic groups) is a strength of this research. By targeting schools known to have a higher proportion of Maori and Pacific students, we aimed to oversample parents in these ethnic groups, but response rates were generally lower from those schools. The distribution of our predominantly female participants across ethnic groups (62% European, 16.4% Maori and 7.4% Pacific) closely reflects that of females aged 30–55 in the Wellington region where 70% are European, 11.7% Maori and 4.7% Pacific. Respondents may be more representative of parents who have stronger views towards this vaccine.

Pacific parents most often responded in ways that differed from the three other groups, but findings should be interpreted with caution due to the smaller sample size (n=57). The response rate (25%) and recruitment of parents from only one region limits the generalisability of the findings beyond the study participants. However, the response rate is likely to be slightly higher than that reported, as we were generous in the number of surveys distributed to schools, having been given estimates of student numbers at participating schools. A survey of parent attitudes to HPV

vaccination achieved a similar response rate (22%) in the United Kingdom,[30] and the Christchurch survey of GPs and practices nurses reached a 39% response rate.[27]

Conclusions

We suggest that a programme jointly delivered in primary care and school settings, that is appropriately resourced for follow-up and information-sharing would increase vaccine coverage. The rationale for vaccination at age 12 needs to be made clear to parents and evidence-based information needs to be delivered appropriately to parents and girls. As with other vaccines, health professionals' endorsement of and support for this new programme will be important to ensure its success.

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COMPETING INTERESTS
None declared.

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