

# Immunisation knowledge and beliefs of health science and non-health science students at the University of Otago

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## Background

Concern has been raised both in New Zealand and other developed countries over low immunisation rates. A number of studies have been carried out to try to understand why this is happening and several potential reasons for the decline have been identified. Reasons parents have for not immunising are varied and can include such things as lack of access to immunisation, lack of knowledge about immunisation, family environment, financial variables, language and cultural issues.<sup>1-3</sup> However, other parents are actively choosing not to immunise. Reasons for this can include:

- concern over vaccine safety or side effects,
- the belief that immunisation does not prevent disease,
- the belief that immunisation is not necessary to protect against disease and that vaccine-preventable diseases are no longer a problem.<sup>4-7</sup>

A study investigating incomplete immunisation among children in Australia estimated that 2.5–3% of parents object to, or are concerned about, immunisation.<sup>8</sup> Parents who disagree with immunisation are more likely to be highly educated and have a tertiary qualification.<sup>5,8</sup> None of the studies we found investigated the type of tertiary qualification of the parents. Our hypothesis is that the type of tertiary study or qualification

## ABSTRACT

### Aim

To compare the immunisation knowledge of university students receiving a health science education at Otago University with that of students not receiving a health science education and to investigate if the two groups differed in their opinions on immunisation.

### Methods

One hundred and thirty-four students (in at least their third year of university study) completed a structured questionnaire on immunisation knowledge and beliefs.

### Results/Conclusions

Over 90% of the students in both groups indicated that if they had a child, based on their current knowledge of immunisation, they would immunise their child. As expected from the study selection criteria, the students' knowledge of immunisation came from different sources but the most trusted source of information for both groups was doctors. However, the students did differ significantly in how well informed they felt about immunisation. This may have implications for their decision to immunise their children in the future.

### Key words

Immunisation, beliefs, students

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tion will play a major role in attitudes towards immunisation. Specifically that individuals studying one of the health sciences and being taught courses such as microbiology and immunology will have a greater understanding of immunisation compared to students taking other courses and that this may affect their decision on whether or not to immunise any children they may have in the future.

nise any children they may have in the future.

The aim of this study was to determine students' knowledge about immunisation and on what information they based this knowledge. Students selected to take part in the study were all in at least their third year of study. We chose senior university students as it was shown by

Wilson et al. in a study examining attitudes of naturopathy students towards immunisation, that attitudes can vary considerably depending on the students' year of study, with opinions becoming more polarised in senior students.<sup>9</sup> The questionnaire was structured so that the students were asked early in the study if, based on their current level of knowledge, they would immunise their children. Following on from this we asked questions to ascertain where they were getting information on immunisation, how much they trusted this information and whether they felt well informed about immunisation.

## Methods

Study participants were 134 Otago University students who were in at least their third year of study. Potential participants were approached by the researchers in public places on the university campus or surrounding areas. Students not in at least their third year of university study were excluded. Researchers provided potential participants with an information sheet regarding the study and all participants gave written consent. Ethical approval for the study was granted by the School of Pharmacy, University of Otago, Dunedin, New Zealand.

Consenting study participants completed a structured three-page questionnaire regarding knowledge of immunisation and their intention to immunise any children they would have in the future.

## Statistical analyses

The Chi Square statistic was used to test for differences between groups. Due to the small numbers in some groups, data has in some instances been pooled for statistical analysis. Data handling and analysis was done using Microsoft Excel.

## Results

A total of 134 senior students completed questionnaires. Over 90% of students approached completed questionnaires. Sixty-six of the respondents were taking health science courses and 68 were taking non-health science courses. Health science students were enrolled in a variety of courses including medicine, pharmacy, physiotherapy and dentistry, microbiology and biochemistry. Non-health science students were also studying subjects from a variety of disciplines including the humanities, commerce, law and physical sciences. The health science group had a higher number of female re-

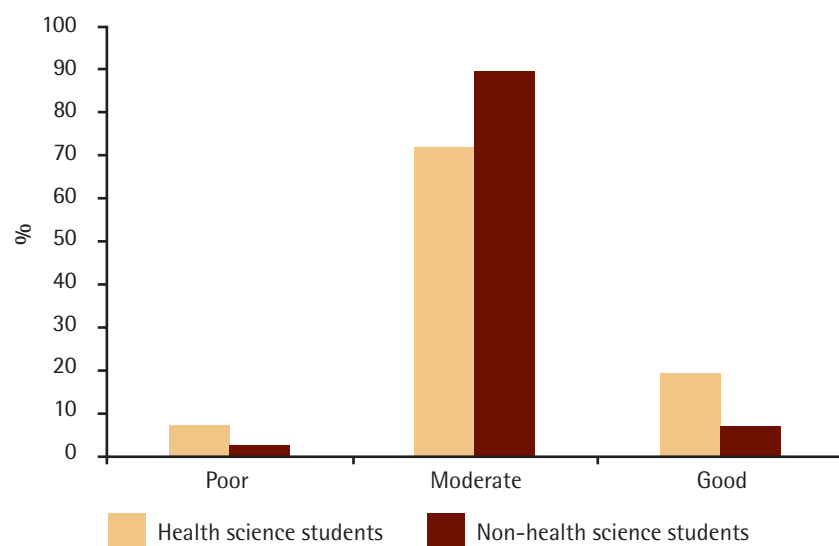
spondents than the non-health science group (63.6% vs 47.1,  $P=0.05$ ).

The students were asked to define immunisation. The answers to this question were examined thematically. Common themes were that immunisation involved injecting a vaccine which represents the infecting organism, that it is a way of providing protection from this organism or that the body responds to the vaccine by making antibody that provides protection against future encounters with the infectious organism. If the respondent could not identify any of these themes then they were classified as having a poor knowledge of immunisation, if they got one or two of these themes they were classified as having a moderate knowledge and if they mentioned all these themes they were classified as having a good knowledge of immunisation (Figure 1). Most health science and non-health science students had a moderate or good knowledge of immunisation (>92%). There was no statistical difference in the responses from the two groups.

Following on from this the students were asked to consider the statement 'If I had a child, based on my current knowledge of immunisation, I would have them immunised'. The questionnaire was structured so that this statement came before questions on their sources of information on immunisation and their level of trust in these sources so as to provide an unbiased answer. The majority of respondents indicated they would immunise their child (Figure 2). Overall, 97.0% of health science students and 94.1% of non-health science students agreed that they would have their child immunised. There is no significant difference between the groups with regard to the decision whether or not to immunise (strongly agree  $P=0.44$ , agree  $P=0.65$ ).

We next asked the students if immunisation should or should not be mandatory and why they thought this. Although over 90% of the students had already stated they would immunise their child in order to protect them against disease, only 56.1% of health science students and 39.7% of non-

Figure 1. Understanding of knowledge of immunisation. Level of understanding of health science and non-health science students of immunisation was classified as being poor, moderate or good depending on the number and themes of the responses.



health science students thought immunisation should be mandatory (Table 1). The difference in response between the groups was not significant ( $P=0.06$ ). The students were asked to give a reason for this choice and these responses were examined thematically. For both groups the main reason for not wanting immunisation to be mandatory was concern over freedom of choice and the main reason for immunising was to prevent disease.

The next section of the questionnaire examined where the students got information on immunisation from, the level of trust they had in this information and if they felt well-informed on the subject. Health science and non-health science students obtained knowledge on immunisation from very different sources (Table 2). The majority of health science students had learned about immunisation in the course of their studies, either directly through lectures or indirectly through reading journal articles or textbooks. The non-health science students did not have lectures on immunisation and would not be reading material on this for their course of study and this was reflected in the low number of students getting information from these sources ( $P<0.001$ ). The media, doctor and family or friends were common sources of information for both students. Family and friends were reported as a

Table 1. Beliefs of students on mandatory immunisation

	Health Science		Non-Health Science		P value
	Number	(%)	Number	(%)	
Should immunisation be mandatory?					
Yes	37	(56)	27	(40)	0.06
No	28	(42)	39	(57)	0.08
No response	1	(2)	2	(3)	
Reasons for and against mandatory immunisation					
Freedom of choice	21	(32)	31	(46)	0.10
Disease control	22	(33)	15	(22)	0.14
Cultural or religious beliefs	1	(17)	10	(15)	
Potential risks or side effects	3	(5)	8	(12)	
Other	6	(9)	6	(9)	

source of information significantly more often by non-health science students than health science students ( $P=0.02$ ). Other health care professionals and the Internet were sources of immunisation information for only a few students from both groups.

The students were then asked which sources of information they trusted the most (Table 2). The most trusted source of information for both groups was the doctor, however non-health science students put more trust in the doctor than did health science students ( $P=0.02$ ). For

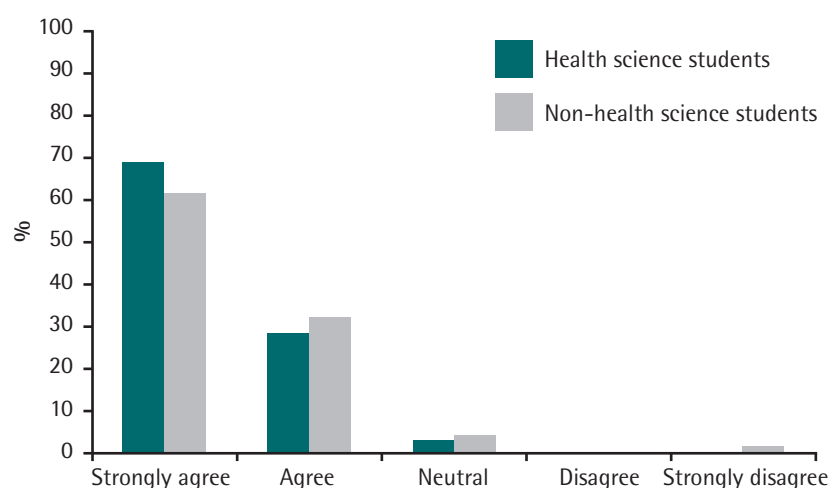
the health science students, the next most trusted sources of information were lectures and textbooks or journals (33% and 39% respectively). Family and friends were a more trusted source of information for the non-health science students, as were nurses. Few students trusted information gained from the media.

The last question in this section was on how the students rated their overall knowledge on immunisation (Figure 3). This question produced some interesting results. Two-thirds of the health science students felt that they were well informed about immunisation (strongly agreed 15.15%, agreed 51.52%) while with the non-health science students less than 20% of them felt they were well informed about immunisation (strongly agreed 1.47%, agreed 16.18%). Overall there was a statistically significant difference ( $P<0.001$ ) between non-health science and health science groups with regard to how well informed they feel about immunisation.

## Discussion

Although the study was limited to some extent by its size, some interesting findings were apparent. The selection criteria were set to provide us with two groups of students, one in which the students would have been exposed to immunisation information as part

Figure 2. Responses of health science students and non-health science students to the statement 'If I had a child, based on my current knowledge of immunisation, I would have them immunised'.

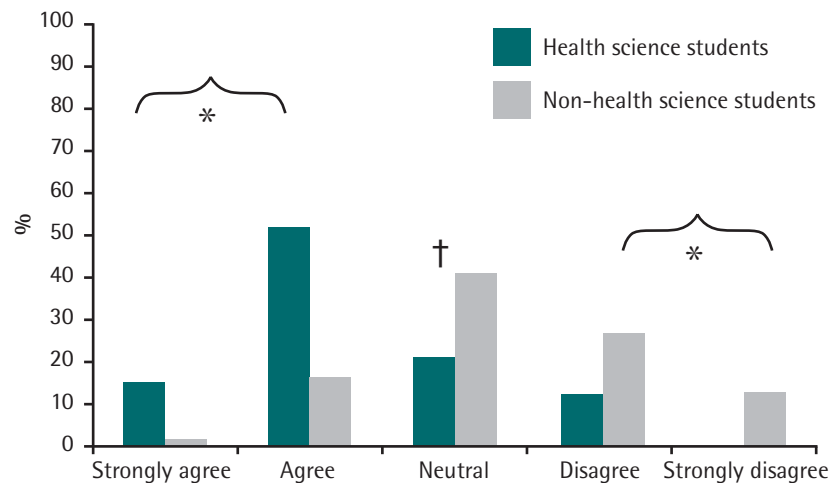


of their course of study (health science students) and one group who would have had little exposure to immunisation information in their studies (non-health science students).

The aim of the first section of the questionnaire was to establish the students' understanding of immunisation. Both health science and non-health science students were determined to have a good understanding of what was meant by immunisation. This is not surprising as the respondents are all highly educated and information about immunisation is widely available from many sources.

The responses to the question '*If I had a child, based on my current knowledge of immunisation, I would have them immunised*' were then examined. Almost all students in both groups agreed they would immunise their children. This high level is pleasing, but in this study we are looking at a group who do not as yet have to make this decision and what will happen in the future when the students start to have families is, of course, unknown. It is possible that at least some of the study participants will change their minds. A study carried

Figure 3. Responses of health science students and non-health science students to the statement 'I am well informed about immunisation.'



\*  $P < 0.001$ , †  $P < 0.05$

out by Wroe et al. examining decision-making regarding immunisation by women in their third trimester of pregnancy, found that 88% of participants made the decision during the antenatal period. Interestingly this study found that decision-making was based on the weighing up, by the parent, of the perceived relevant pros and cons which were sometimes inconsis-

ent with scientific evidence and were influenced by emotional factors.<sup>10</sup>

Although almost all study participants said they would have children immunised, less than 60% agreed it should be mandatory. The main reason for this was the feeling that making immunisation mandatory impinged on the parents' freedom of choice. Thus it was not the immunisation they objected to, but the idea of being told they had no choice in the matter.

Not surprisingly most health science students got information on immunisation from lectures or through reading textbook or journal articles. However many students did not trust what they were taught or what they read. Over 90% of the health science students reported lectures as a source of immunisation information, but only 33% placed a high level of trust in this information. This may reflect on the way tertiary students are encouraged to be independent researchers and thinkers and to critically evaluate all information they are given. The next most common sources of information for the health students and the most common sources of information for non-health science students were family and friends, the media and doctors. Even though information was obtained from these sources at a similar level, the level of trust the participants

Table 2. Source of immunisation information and level of trust in the source of information

	Health Science		Non-Health Science	
	Source Number (%) <sup>1</sup>	Trust Number (%) <sup>1</sup>	Source Number (%) <sup>1</sup>	Trust Number (%) <sup>1</sup>
Lectures	61 (92)	22 (33)	2 (3)	1 (2)
Textbook/Journals	47 (71)	26 (39)	7 (10)	7 (10)
Media	30 (45)	0 (0)	46 (68) <sup>†</sup>	3 (4)
Doctor	31 (47)	27 (41)	42 (62)	42 (61) <sup>†</sup>
Pharmacist	10 (15)	5 (8)	5 (7)	6 (9)
Nurse	11 (16)	6 (9)	20 (29)	10 (15) <sup>†</sup>
Health Clinic	11 (17)	1 (2)	12 (18)	3 (4)
Family/Friend	35 (53)	4 (6)	49 (72) <sup>†</sup>	13 (19)
Internet	13 (20)	0 (0)	4 (6)	1 (2)
Other	6 (9)	2 (3)	15 (22) <sup>†</sup>	5 (7)

<sup>1</sup> Respondents could nominate multiple sources of information and trusted sources of information, therefore the sum of the percentages is >100.

\*  $P < 0.001$ , health science vs non-health science

<sup>†</sup>  $P < 0.05$ , health science vs non-health science



had in them varied greatly, with doctors being highly trusted, family and friend having an intermediate level of trust and the media being trusted not at all or at a very low level. This is encouraging due to sensationalist reporting of unfounded links between some vaccines and chronic health conditions. The high level of trust in information gained from doctors supports the findings of a number of other studies, in which doctors were commonly cited as a trusted source of immunisation information.<sup>5,11</sup> It is interesting that the Internet was not used as a source of information by many students as these students would all have ready access to computers and the Internet. This may reflect that immunisation is not a major issue for them at this stage of their life and it would be of interest to see how widely used the internet is as a source of information by parents in the antenatal period. Both groups had only a low level of trust in the media as a source of immunisation information. This low level of trust was also seen in a study carried out by Jelleyman and Ure in which they asked health professionals about the influence of media reporting of links between MMR and autism and/or Crohns disease on their attitudes towards MMR vaccine safety. Only 14% of the health professionals surveyed thought they were influenced by the media, however as 37% of respondents were still unsure about MMR vaccine safety, the power of the

media should not be underestimated.<sup>12</sup> This reported lack of trust for the media has implications for using the media to create awareness in large-scale immunisation programmes such as the meningitis immunisation scheme being carried out in New Zealand. It may be more appropriate to deliver immunisation information through trusted health professionals who can discuss vaccine misconceptions and allay the fears of the individual or parent.

The final question in the survey asked how well informed the students felt they were about immunisation. This is where a significant difference between the two groups of students was apparent, with many more health science students than non-health science students feeling well informed. Although the non-health science students in the study did understand immunisation at a basic level, it appears that they do not feel fully informed on the topic. More health science students felt informed, presumably due to access to additional immunisation information from lectures and readings, as these were the only source of information not available to the non-health science students. However, this perceived lack of information did not affect the students' current opinion on immunisation, as almost all students in both these groups agreed that they would have their child immunised. It would be interesting to see if groups such as these, which do have differences in their level and type of information on immunisa-

tion, did eventually have similar rates of immunisation for their children.

A limitation of this study is that we do not know what the respondents' final decision regarding immunisation will be; it is likely that at least some of these students will change their minds. Another confounding factor in this study is that as well as having more information on immunisation, it is possible the health science students also have a greater knowledge of the diseases immunised against and how serious these can be. This may affect their willingness to advocate for immunisation. Additionally even though the number of individuals declining to participate in the study was low, this could have biased study results.

New Zealand, for a variety of reasons, is having difficulty in achieving national childhood immunisation targets. Studies carried out both overseas and in New Zealand have found an association between tertiary education and non-immunisation. This survey demonstrated that health science students, who have access to a greater number of sources of information on immunisation, feel more informed about immunisation than non-health science students. While the difference in the perceived level of information did not impact on their views of immunisation at the present time, it may have an impact when they are faced with the actual decision in the future. More research is necessary to investigate if this is the case.

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