Knowledge Transfer: Examining a Public Vaccination Initiative in a Digital Age

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Abstract
This research applies knowledge management principles to examine knowledge transfer in the social marketing of the human papillomavirus (HPV) vaccination program for girls and young women. Using focus group research we develop framework to define the domain of health based decision making in young women and develop understanding of constructs in knowledge transfer along the health consumer supply-chain. We find these are the role of trust, the absorptive capacity of the receiver, the medium of the knowledge object and the authority of the figure providing that knowledge. These findings have implications for budgetary support of and accountability for public health knowledge transfer mechanisms.

1. Introduction

The participation in a program to vaccinate against communicable disease is a conscious decision. The consumer is a participant in and the end-point of the health supply chain, making their decision by acting on information – a knowing step [1, 2] where individuals “expand their personal knowledge and apply it” [3].

The Australian Advisory Committee on Immunization Practices (ACIP) in June 2006 first advocated a universal human papillomavirus (HPV) program for girls and young women. We sought to investigate the knowledge and attitudes behind the decision to have or to decline the papillomavirus vaccine, Gardasil™ that is now part of the National Immunization Program. HPV protection is achieved through a course of three doses of vaccine given over a six-month period.

HPV vaccine is provided to girls in the first year of high school. Students under 18 years of age required parent or guardian consent forms to be signed in order to receive the vaccine. There was also a catch-up vaccination program was made up of two components: a school-based program and a community-based program. The school-based catch-up program for girls aged up to 18 years old finished in 2008. The community-based catch-up program was made available through private doctors and through community immunization services for 13 to 26 year old women. This program finished on 31 December 2009.

Despite the free administration of this vaccine to a selected population segment of girls and young women, a number of issues were raised. These included vaccine inequities, lack of knowledge and misunderstandings cause some individuals not to take-up or not to complete the course of vaccination. Within the group of people who have been offered the HPV vaccination, many are already responsible for making their own health decisions. No research appears evident about health information seeking and decision making of this kind in the nature of the transfer and development of new knowledge to this target group. Specifically we identify trust [4, 6], the capacity of the recipient to understand the information provided [26, 27] and its perceived relevance to them [1, 2]. These three issues are investigated to create new understandings that can be
applied in the event of the development of other similar public health programs.

We draw on and seek to further and to validate previous research into the understanding and decision-making expressed as uptake of the vaccine program [21, 22]. Other authors have identified a number of issues including a lack of clear information about how the vaccine worked, how long it worked for, contraindications, and risk groups [19, 20]. It has investigated issues of organization-to-public knowledge transfer in particularly in relation to issues of trust and the absorptive capacity of recipients across a broad target group [1].

The first section of this paper examines the literature in knowledge transfer and social marketing – the marketing of socially useful goods and services. The following sections describe and discuss the results of focus group research to develop a framework to define the domain of health-based decision making in young women. Finally, we develop the understanding of constructs in knowledge transfer along the health consumer supply-chain to investigate in future broad-scale research.

2. Knowledge management

Knowledge management (KM) authorities [4-6] suggest that effective practice of the management of knowledge transfer acts to increase the effectiveness and efficiency of organizational activity.

KM programs are an integral part of the holistic practice of the management and support for the transfer of explicit and tacit knowledge. KM issues include the development, implementation and maintenance of appropriate organizational knowledge resources, human resources, and technical infrastructures to enable knowledge sharing. KM is a tool to support decision-making [4, 7, 8].

To be useful and effective in a public health context, a KM program must be derived from the aims and objectives of the health provider organization [9]. Inability of the public to leverage available knowledge resources leads to limited capacity to respond to their environment and make informed, knowledgeable decisions about their health present and future. Specific KM strategies are discussed widely in the literature. These include: capture and storage of documents in databases, the use of an intranet or Knowledge Portal, organizational learning strategies, the use of technology to support remote interaction by staff, development of communities of practice and mentoring to transfer tacit knowledge, the promotion of innovation, and the identification of organizational experts through a directory as a resource to others [10-13].

Public Health initiatives often rely on distribution of the health message, on the understanding of that message and of action on it. Intra-organizational knowledge needs are widely discussed, and there is smaller body of work addressing transfer of knowledge from organizations to an individual that focuses on consultants and their clients, and on individuals within the supply chain. However, we see health consumers as a significant but very different segment of the health information supply chain. While Knowledge management research focuses in the main on intra-organizational activity this research examines the management of the transfer of knowledge from the organization to general members of the public. Acting on this information either positively or negatively is the expression of knowledge. In this particular case the intention is to ensure that, the individual health consumer is equipped with the right knowledge at the right time to fulfill public health aims and objectives.

2.1 Knowledge transfer for social marketing

Internationally, there has been significant contribution made using social marketing techniques for diverse public health gains as well as in research for example, in the prevention of Syphilis among men, tobacco control programs and culturally innovative diabetes interventions. In the main, these programs use social marketing campaigns. However, these campaigns are not based on the results social marketing research techniques. There are many that recognize the myriad of social problems but few strategies available to solve these problems. The primary aim of this research is to develop an framework to define the domain of health-based decision making in young women at the threshold of adulthood. It examines sources of individual knowledge for evidence-based decision-making. These findings may offer varied perspectives on pertinent health promotion that public health practitioners, industry groups, and government may want to consider when developing integrated policies and other immunization programs related to sexually transmitted diseases.

Individual health decisions are determined by attitudes, behaviour, lifestyles and government policies [14]. This research therefore will examine not just the development and delivery of a message targeting individual voluntary behaviour change, but the intention of ‘changes in social structures that will facilitate individuals reaching their potential’ [15]. As
most individuals have access to health facilities, they are in a position to be provided with information regarding concerns that affect their health status and understanding how one can motivate an individual to change their behaviour through social marketing campaigns.

Information campaigns have not met with much success and one of the reasons for this was attributed to the use of mass communication to change public attitudes or behaviors. Kotler, [16] proposed the following factors that mitigate the impact on mass media: People’s characteristics like apathy, defensiveness and cognitive ineptness. Ineffective messages, failure to use appropriate media and lack of response mechanism factors. Kotler [16] advocates that all social causes have a social objective to achieve. These objectives administer changes in people in terms of cognitive changes, changes in action, behavioral change and changes in values. A Canadian campaign to encourage healthcare workers to vaccinate against influenza was based on the health belief model, but was found to be unsuccessful [17]. This further suggests that strategies must address both personal and organizational influences on health knowledge acquisition.

Kahn et al [18] examine what knowledge young women had about HPV and the vaccine itself, their beliefs, approval of HPV, number of sexual partners, and perceived support of healthcare provider, partner and parents identified that these variables were associated with the intention to receive the HPV. While the acceptably of the vaccine were examined by Boehner et al. [19] and found that 74% females were affirmative about the vaccine. Subsequently, recent studies Carson, Kispert and McGrath [20] identified that 75.3% of women were more likely to receive the HPV vaccine if it were offered free, unlike other studies that indicated little knowledge on the HPV, [21-23] this study found majority of the young women were knowledgeable about HPV.

To achieve these behavioral changes an outline of how effectively social campaigns can be used to influence decision making in the uptake of a free HPV vaccine are proposed below. To bring about cognitive changes, social campaigns use dissemination of new information to people and raise their awareness. In the case of the HPV vaccine, the government made all efforts since the announcement of funding for a HPV vaccination program in 2006 to promote the program. Another strategy of social campaigns is to persuade the target audience to perform a particular act or practice within a specified time [24]. For example, the mass immunization programs for HPV that targets a certain age group that needs to be undertaken within a particular time.

For a behavioral change strategy, it is suggested that campaigns are introduced to persuade people to change their behaviour for their own welfare. Old habits die-hard and this by far may be the most difficult campaign to achieve results like in the case of smoking and drugs. The last strategy in any the transfer of knowledge from public institutions to private individuals in any social marketing campaign involves changing beliefs, values and ideas. Three issues must be further explicated in the nature of the transfer and development of new knowledge to the target group: these are trust [25] and the capacity of the recipient to understand the information provided [26, 27], and its perceived relevance to them [28].

2.2 Knowledge as part of the health supply chain

It is commonly understood that knowledge exists in people and their interactions both individually and organizationally. Knowledge therefore exists within each part of a supply chain. Knowledge develops in a flow between the theoretical and the applied [29]. Knowledge resides in each individual, not in the organization. An organization holds information in the form of documents and databases. Knowledge is information used in specific contexts. Knowledge is information enacted by individuals in the course of their work or other activity.

Within the Public Health knowledge supply chain, the standard focus of research public health research on effective models and strategies to support knowledge transfer is on the provision of evidence based knowledge for health practitioners [1] for public health decision-making. Possible failure in this lies not in the efficient and effective delivery of Public Health services, but in gap between this and the imperative to ensure broad uptake of public health measures across a population. In this case the HPV vaccination program.

In the following sections, we identify absorptive capacity, the location of knowledge and trust as interacting constructs forming barriers to knowledge transfer in the public to the private sphere.

2.3 Absorptive capacity and knowledge resources

Szulanski [26, 30] and von Hippel [31] identified obstacles to the effective sharing of knowledge as: recipients’ lack of absorptive capacity in their ability to understand or apply knowledge from a source that is outside their worldview or experience; contextual ambiguity; and an arduous, non-trusting or strained
relationship. In short, “unless the knowledge held by the buyer and seller overlaps, they are incapable of working together.” [32] In an HPV knowledge context, this is reflected in discussion of the need for knowledge redundancy to facilitate knowledge transfer.

There are three locations of knowledge within the HPV vaccination program supply-chain: the knowledge that is the domain of participant A and separately the knowledge that is the domain of participant B, and the knowledge that is common or redundant between the participants (a shared knowledge domain). Redundancy is neither unnecessary nor duplicated knowledge but is the overlap of knowledge that is critical to superior supply chain performance. Knowledge redundancy is developed through long-term relationships with strong ties between participants [32-34]. Therefore, a low level of redundancy due to weak ties or to short term, transient relationships makes knowledge exchange more difficult. The expectation that new knowledge is more often sought and better integrated when there is an established context of “old knowledge” is found to be true [35].

2.4 Trust and HPV vaccination in the health supply train

Knowledge sharing relationships are not predicated on liking the other individual but rather on the notion of trust, mutual respect, mutual interests and mutual benefit [36]. Therefore, engagement with the health consumer requires the delivery of trusted knowledge from a perceived authoritative source.

Trust is a confident mutual reliance or expectation on some quality or attributes engendering goodwill between partner organizations. Aulakh, Kotabe, and Sahay [37] and more recently Li [38, 39] suggested that the relationship between trust, shared vision, and knowledge transfer environment is inextricable. That knowledge exchange relationship is a mix of both social and economic exchange. Trust plays an important part in the capacity or willingness of organizations to share knowledge and operates at an inter-organizational level when one partner has “confidence in an exchange partner's reliability and integrity” [40]. Maznevski and Athanassiou’s [41] work on knowledge transfer finds that the flow of knowledge depends on informal personal influence and persuasion – attributes that are intrinsically difficult to regularize or to control. Knowledge must be leveraged through the development and use of social capital and personal networks.

Competence trust is the expectation about the parties’ capacity to deliver effectively on the required goods or actions, while “goodwill trust refers to the degree to which one partner trusts the other to look after its interests without explicitly asking for such help.” [33]. Therefore, goodwill trust relies on an increased number of interpersonal interactions. Trust is a conduit to effective inter-organizational knowledge sharing. We suggest that in knowledge transfer relationships, trust and absorptive capacity are therefore an essential context for the support of effective knowledge transfer between HPV vaccination supply chain partners and the consumer as the end point in the chain.

3. Methodology and findings

This study, use a mixed methodology through focus groups and the examination of published material in paper and in digital formats. Published material includes government health portals; the disseminations of printed information to schools and through medical practitioners. We also referred to advertising by government authorities that sold a message without substantive information content.

The focus group method is particularly useful for investigating the knowledge people have and their experiences. The research sought to stimulate peer interaction and discussion among focus group members as being part of the natural context of their environment [42]. Focus groups are often used to examine how people think and why they think in that manner [43]. This method is commonly used for evaluating health education messages and examining health behaviors of the public [44-47]; focus group discussions can produce a broader and more critical analysis on a topic than individual interviews [42].

Local government in Victoria received approximately $9.5m in funding to deliver the school based immunization program [48]. Therefore, a discrete local government area was selected and focus groups were drawn from the Northern Metropolitan local government region of Melbourne. Demographic information was collected and confirmed that participant ages ranged from 16 to 25 years old and included school-based and youth centre participants and university participants. The level of education was determined by the recruitment method. Participants in schools were in years 10 - 12. Youth centre participants were not currently attending school. University based participants were at the undergraduate level. Participants were from a range of backgrounds, with the majority being born in Australia (approximately 80%); the balance drew from Southern Europe, West and South-East Asia, the Pacific Islands, Africa and Central America. This is demographically similar for the region to the
population distribution from the 1996 Australian census.

Discussions in focus groups thematically analyzed using Nvivo software with attention emergent patterns that were similar (and different) across the groups. Theme nodes and branches were derived from the literature. Coding was done by the researchers and inter-coder comparison was made to reduce coder bias. Major themes were health information, HPV and vaccine knowledge, sources of knowledge and decision-making. The health information section refers to discussions about where participants derive their health information. The HPV vaccine and virus knowledge includes participants understanding of HPV and the HPV vaccine. This leads into the sources of that knowledge, which bears some similarity to the health information discussions, but is specific to the HPV vaccine.

Prior to any discussion about HPV or the HPV vaccine, each focus group were asked where they get their health information. Knowledge sources cited were family, family doctors, schools/School Nurses, targeted advertisements and several different types of media mentioned including magazines, pamphlets, newspapers, radio, and online media and podcasts, the search engine Google was mentioned twice. Remarkably several students school aged specifically stated that they did not use the Internet as a source of information while among the university age group this was common. We note that a search of Victorian State Government and local government websites using Google rendered 2,150 hits for HPV a sample of which included very extensive and sophisticated descriptions of the disease against which the vaccination protects and the vaccination program.

3.1 Trust and health knowledge sources

Girls reported that they received most health information from their parents, their doctor, the media (such as radio advertising or pamphlets received at the doctor or school), from online sources, friends or from their school.

All focus groups raised parents or other trusted family members as a source of health information. Participants referred to their mothers and sisters more so than they referred to their fathers. On only two occasions, participants reported speaking to their fathers about health because they were both doctors. When referring to their doctor, this meant either their family doctor. The distinction was made twice between seeing a doctor and attending the local health centre for information.

Sharing information with friends was discussed in four of the five groups. In two of the school aged groups health information was discussed with friends when an issue was important or out of the ordinary. One respondent said that you might talk about “bad things that happen to people” more so than the fact that you are getting your tetanus injection. In the university-aged group, friends were mentioned by more people as a source of information, compared to the school aged groups. The participants mentioned that they would get health information from their school in three of the four school aged focus groups. There were references to school, class or the counselors at school, but compared to other sources of information these was less frequently mentioned.

Only one person advised that they went to their doctor for information. Initially many stated the doctor as an important general source of health information, yet in this specific example, the doctor was not so important. A doctor appears the most obvious source of health information; however, girls were more likely to gain information from their school, family and friends or from advertising.

No students recalled any form of publicity campaign launched on the internet in the main relying on ‘all the information here at school. I am pretty sure my mum didn’t go on line for an extra look.’ It is noteworthy that while regarding the internet as a potential resource, this student specified that her mother would be the one to do such research. Several comments were made about the use of the internet for health information. Some suggested that they would only use the internet to report their “Public Facebook status: ‘Oh my arm is killing me’”. Another was more measured in her trust of online information suggesting that I think the Internet tends to be quite inaccurate for certain things. And so, it is like, “You have a sore throat; you have this exotic disease” although another responded “If you use the Internet and you have gone to the doctors before and they say what [disease] you have got then maybe you might do research.”

These comments reflect a recreational use of online resources and a lack of trust in digital compared to paper-based health information that they knew came from Schools, Government and doctors – all highly trusted by this population.

3.2 Absorptive capacity, advertising and knowledge

In three of the five groups, at least some of the participants could not recall any advertising related to the vaccine. When prompted about different forms of media, this did not assist recall. Typical responses to questions about advertising were “I cannot remember
at all”; “Was it advertised?” and “I don’t really remember anything”. This was, however, not common and in many cases the advertising made a lasting impression. The main types of media that participants remembered as advertising the vaccine were radio; billboards and posters; information sheets handed out at school and pamphlets. The participants remembered several points about the content of the advertising they saw. The most common content remembered related to the “I did it” ads that were mentioned in three of the five focus groups. The responses related both to the television and billboard advertising, which many then linked to receiving the “I did it” band-aid after they were vaccinated. For example:

“I think I just remembered the, ‘I did it’ “
“Yes, the band aid add”
“I got one of those, ‘I did, I did, I did’ that thing.”

Additionally advertising relating to the vaccine being free to the 18-26 age groups outside the school environment until June of that year was mentioned specifically in two focus groups. For example “get them before, like June [or] you have to pay for them”

The information content was considered by some to lack depth, and that it provided “just your basic frequently asked questions” and this it was a “more of a, ‘look we’re here campaign’. There was quite a lengthy discussion in the university group about the HPV virus mode of transmission being absent from the advertising and information. Others mentioned that whilst the advertising campaign did not provide a lot of information, there were phone numbers and other avenues for information provided within the advertisements. This indicates a level of prior knowledge that enabled critical comment.

The design of advertising material was not widely discussed in school-aged focus groups, though it was covered in more detail in the university-aged group. In one of the school groups, it was recalled that advertising material was on “colorful paper”; whilst another remembered a well-known female swimmer was on one of the billboard posters. In the university group it was mentioned that the advertising was “appealing to youth” and that it was clear, well presented and easy to read. They considered the layout to be “just a standard layout” similar to those used produced for other vaccination campaigns. Generally, participants had difficulty remembering a lot of specific detail about visual presentation of advertising materials.

From the perspective of the participants, the advertising campaign appears to have been quite effective in raising awareness about the HPV vaccine. Respondents also commented that the advertising made the participants more interested in the vaccine: “If you are sitting there with your mum (when you hear a radio ad or see a television commercial), you will say ‘Oh yeah, yeah, I will go and get that’ “. Further, “it (the advertising) generated an interest and made you go and look into it a bit more”. Others reported that the advertising campaign was not effective, for example one of the school aged participants talked about her older sister who “hadn’t even looked it up until I got it” She had not taken in the mass media advertising campaign at all.

In the university group, they felt the advertising was more effective when there was a hard copy that could be taken away and read later, such as a pamphlet that “Once you’ve got it at the bottom of your handbag, you will pull it out when you go home.”

While in reference to the large billboard advertisements the participants variously commented that “I find I tend to ignore them because like, you know, they’re always there.” or that it’s “Just another massive advertisement there, I just, like, look at them and then I forget about it a minute later.” However many agreed that if they had not seen or heard anything about the vaccine in television, radio and billboard advertising they would have been unlikely to take hard copies of that advertising. It appears there was not one particular form of media that was more effective than another was. It was the combination of different sources and repetition of the health promotion message that was important.

In these, we see evidence of the relevance of absorptive capacity increasing through the provision of printed materials and message repetition.

3.3 Decision making

Discussion canvassed how participants came to decisions about vaccination. It was evident that there were substantial differences between responses from school-aged groups and the university group.

People and organizations in positions of authority were almost completely convincing for the focus groups conducted in schools. The opinions of parents, the school, the government and doctors are often accepted without question. This indicates trust in those authorities:

- Parental authority: “me and mum sat down and mum was like, ‘Oh, you know, really you should get this’, and I’m like, ‘Yes, sounds alright’ “
- School authority: “I think because the school endorses it... You have got that credibility going with it.”
• Government authority: “Obviously they (the government) produced it and gave it to us, why would they do that if it wasn’t true?”

In particular in the school based focus groups many girls considered themselves to be outside the decision making process: “I just knew it was a needle form [from the School Nurse], so I just gave it to my mum” and that there was “Nothing I can do about it” [having the vaccination]. In the university-based focus group, those who were vaccinated within the school environment similarly noted, “It was kind of the mandatory thing.”

In strong contrast to this acquiescent behavior those young women talking about being vaccinated since leaving school, did not indicate the same compliance with the decision making of authority figures as the younger participants. The opinions of authority figures were still important and the fact that the vaccine was endorsed by authority informed their decision-making suggesting, “You tend to trust the government’s decision to give it to everyone.”

3.3.1 Friends (and others). All the focus groups indicated that their friends were very influential in their having the HPV vaccine. This influence was mainly achieved because “Everyone was doing it.”

This phrase or slight variations of it were said more than once in all groups except the youth service group. This was not an active part of decision-making; there was no participant that said they had the vaccine because a friend was having it. It was more passive in that there were no objections to having the vaccine amongst their peers, so it was not a barrier.

The university groups were more expansive about the precise impact that friends and others can have on decisions. For these participants it was more about the opinions of their friends. For example, one participant stated “I’ve put more trust in family and friends... that’s my final okay I’ll do it, or not.”

In the youth service group, the comment was made that “me, my friends all go together” and that “I got most of my friends to get them too.” Therefore, the influence of what friends and peers were doing made a significant impact on the choice to be vaccinated, perhaps in a more active way than the school and university based groups.

3.3.2 Advertising and knowledge about the vaccine. Whilst there was much discussion about having seen advertising promotion and media related reporting about the vaccine, there were only a couple of specific mentions of this in relation to decision making. When asked if the advertising promotion convinced the participant that it was a good idea to be vaccinated, she replied that she wanted to have the vaccine when she first heard about it.

Despite the lack of specific indications that the advertising campaign contributed to decision-making, discussions about it indicated that there were elements of the campaign that made an impression on participants. There is information that participant took away from seeing the campaign that may have led them to make the decision to have the vaccine. For example, health was an important factor that seemed an obvious reason for participants to have the vaccine. However, without promotion of the vaccine, this may not have been so obvious.

In the school-based focus groups, it was not that important for participants to have a lot of knowledge about the vaccine. However, knowing that it prevented cancer had been enough information to convince them that it would be beneficial to be vaccinated. The advertising campaign clearly made the link between the vaccine and the prevention of cervical cancer.

The university group indicated that advertising and information was important in their decision to have the vaccine. The university group was more responsible for their own health than school-aged participants were. Therefore the information and promotional materials were important for their decision-making. They clearly indicated the importance of having information about both the vaccine benefits and the side effects.

Reflecting on having the vaccine at school, the university-based participants felt there was a lack of information, and that the advertising would have been more convincing it there was more information about the vaccine, what it prevents and how the virus is transmitted. If this was the case, one participant said she would have been “more encouraged, because, you think Genital Warts, and you just think, yuck.”

Another similarly reflected “But because I’ve never heard of it, the HPV and that I could die from that, and yes, it was just it I had of known, just like Genital Warts, like okay. Sign, give me the needle.”

It is important to note that both responses here referred to the common name, Genital Warts, rather than HPV. This appears to have more impact on the participant’s perception of the virus. Respondents considered Genital Warts a more socially unacceptable term. This could influence their decision to have the vaccine. What is worthy of note here is that none of the advertising resources or the pamphlet material referred to Genital Warts.

3.3.3 Misinformation. Whilst certain types of information appear to have aided the decision to have
the HPV vaccine, receiving the wrong or conflicting information about HPV or the vaccine acted as a barrier in the decision to have the vaccine.

In one of the school-based focus groups, there was discussion that a girl at the school had not had the vaccine because she and her parents “said it would increase the risk of her getting it.” There was another comment that a girl was not getting the vaccine because she was already sexually active. The university-based focus group raised the issue that different doctors had given different opinions on whether or not the vaccine was safe. Whilst another group indicated that the doctor and the receptionist at the medical centre had given her conflicting information about the vaccine.

Receiving these kinds of conflicting, incomplete or incorrect information was particularly important to the university-based focus group where being properly informed was important for independent decision-making than for the school-aged participants.

4. Discussion and conclusions

We find that there are combinations of factors involved in decision-making. While this thematic analysis has separated the different factors contributing to decision making into single themes, in fact it was a range of combined factors influenced most participants to decide to vaccine or not to vaccinate. Some of these were explicitly stated: “But with the notices, and they gave us all the information and ... I had heard anyway about, on the radio, on the TV, so, it just sort of came about that, ended up going for it.” Further, a respondents suggested “it was a combination of, I guess, government subsidizing it, go find out more about it, okay, yes, I really need this. So I wouldn’t say it was one or the other separately.”

In the school-based groups, the most important influences were trusted authority figures. There were some participants, particularly in the school based groups did not feel that they were involved in the decision making process at all. They appeared compliant. They relied on and trusted the authority figures in their lives: their school and their parents. The fact that the girls around them were being vaccinated meant the girls were less inclined to question whether they should have the vaccine.

There was limited knowledge in the school-based groups about the HPV virus is and its transmission. Specifically there was limited knowledge how these issues relate to a vaccine that prevents cervical cancer. Though for many, this knowledge was not necessary as part of decision-making because they trusted their parents to read the vaccine related information and make the decision on their behalf.

In the youth service discussion, whilst the responsibility for the decision rested more with the participants themselves rather than a parent figure, they very much trusted the advice given to them by the staff at the centre. The youth service respondents were well informed and understood the information they had received about the vaccine. Health was a very prominent reason for having the vaccine. Though it was not raised in the discussion, the fact that the vaccine was provided free of charge is likely to have influenced their decision. This may not have been mentioned because most services at the centre are provided free of charge so there may be an inherent expectation of this.

Decision making in the university group was the most diverse, and the most considered by participants compared to the younger groups. There were a complex set of often-interlinked factors contributing to decision-making. The advice of family and friends, relationship status and the further research they had done were of primary importance in their decision. The provision of the vaccine free of charge was an important factor for the participants, though it was not the sole factor in the decision. Provided the other factors were positive, it was considered by many as a final reason to have the vaccine. However, even at this stage, the inconvenience of organizing to have the vaccination may have stopped the participants. Participants were encouraged to have the vaccine more so, with the addition of a deadline for when the vaccine would no longer free.

There were many similarities between groups in terms of sources of general health information and specific information related to the HPV vaccine. Knowledge of the virus and vaccine was varied, but it was evident that all groups were very aware that the vaccine prevented cancer and that it was beneficial for health. There were however, gaps in the knowledge of participants in all the focus groups. This can be attributed to the promotion of the vaccine, lack of interest or lack of involvement in decision-making, particularly in the school-aged groups.

Across all groups was no single identified factor that influenced participants' decision to have the vaccine or not. Whilst there were discussions about barriers to decision making, unfortunately there were no participants who were not vaccinated, which would open up more discussion of this. We note that many of the factors that aid decision making such as parents and other authority figures could potentially be significant barriers. Given that all participants were vaccinated, this could not form part of the
discussions. No students reported agreement with those who they reported had elected not to participate in the vaccination program. This is at the same time a limitation of the research in the research was able only to test the positive, and not the negative as well. This limitation requires further investigation.

Of the over 40 government Fact Sheets examined, all contained references to relevant websites. Of interest in this discussion of knowledge transfer was the limited role of the internet as a resource. At the same time government is placing a great deal of emphasis on positioning it health messages on the internet, however in the public health immunization sector we find that the decision making is in the main made by parents who appear to rely on the paper based information sources provided by the issuing authority. This is worthy of future focused research.

We have established the following constructs for knowledge transfer from the public organization to the private individual – the end point in the Public Health supply chain. These are the role of trust, the absorptive capacity of the receiver, the medium of the knowledge object and the authority of the figure providing that knowledge. These issues have implications for budgetary support of and accountability for public health knowledge transmission. These will be the subject of future broad scale testing.

5. References


