



HPV vaccination in Papua New Guinea to prevent cervical cancer in women: Gender, sexual morality, outsiders and the de-feminization of the HPV vaccine

Angela Kelly-Hanku^{a,b,*}, Jamee Newland^b, Peter Aggleton^{c,d}, Sophie Ase^a, Herick Aeno^a, Voletta Fiya^a, Lisa M. Vallyley^b, Pamela J. Toliman^{a,b}, Glen DL. Mola^e, John M. Kaldor^b, Andrew J. Vallyley^{a,b}

^a Sexual and Reproductive Health Unit, Papua New Guinea Institute of Medical Research, Papua New Guinea

^b Kirby Institute for Infection and Immunity in Society, UNSW Sydney, Australia

^c Centre for Social Research in Health, UNSW Sydney, Australia

^d Sociology Department, Australian National University, Australia

^e Department of Obstetrics and Gynaecology, University of Papua New Guinea, Papua New Guinea

ABSTRACT

Papua New Guinea has among the highest estimated burden of cervical cancer globally, but currently lacks national cervical screening or human papillomavirus (HPV) vaccination programmes. The Papua New Guinean government is committed to introducing the HPV vaccine for primary prevention, but locally-relevant research evidence is not available to guide implementation. Experience from earlier Papua New Guinean health programmes suggests that appropriate engagement with local health cosmologies and cultures for health/wellbeing, illness/disease, and recognition of the role of 'outsiders' in preventing, promoting or contributing to sickness, are essential to the successful introduction of biomedical interventions in this setting. We describe findings from a multi-site qualitative study undertaken in three provinces in Papua New Guinea (2012-14). Twenty-one gender specific focus group discussions and 82 semi-structured interviews, with a total of 208 participants, were conducted. There was strong community support for the introduction of the HPV vaccine for cervical cancer prevention in Papua New Guinea. Significantly, and despite being officially discussed in the context of a planned future intervention focusing on vaccinating young girls to prevent cervical cancer, the intervention was de-feminised, where both girls and boys were supported to be vaccinated in any HPV programme in Papua New Guinea.

1. Introduction

Vaccines constitute one of the greatest advances in modern medicine, preventing and even eliminating disease [1]. However, vaccines have proved contentious in some circles [2]. Globally, anti-vaccination campaigners have exploited deeply rooted fears about vaccines and their effects, contributing to political [3], as well as religious conflict [4]. Arguments within these campaigns have triggered debate and fears over the 'violation of children's bodies'; individual versus public good; the ethics of mandatory vaccination; narratives of risk; the perceived side effects such as infertility; and the long-term consequences of colonial medical malpractice [2-8], among other factors.

As biomedical technologies such as vaccines are introduced into and scaled up in different cultural contexts, they take on a life of their own, with neither the same nor easily predictable constitutive effects across settings. In this way, the meanings ascribed to them, and the responses they incite, are transformed through local engagement. This includes the ways in which technologies are promoted and marketed by

pharmaceutical companies to governments, donor agencies and the wider communities in which they are used [9,10]. Like other childhood vaccinations, vaccination against the human papillomavirus (HPV) has not been without controversy [7,11-19], triggering debates about adolescent girls' sexuality and childhood immunisation more generally; with some claiming the HPV vaccine has caused an unnecessary biomedicalisation of girls bodies [13], the 'corruption of purity' [12] and 'the pharmaceuticalization of sexual risk' [14].

In this paper, we examine community discourses about the impending introduction of the HPV vaccine for the prevention of cervical cancer in women in Papua New Guinea, which has among the highest rates of cervical cancer and cervical cancer-related deaths globally [20]. The results in this paper derive from a larger mixed method qualitative study, the first of its kind in the country to examine community knowledge of cervical cancer [21], its etiology, HPV vaccine messaging preferences [22] and subsequent readiness for the HPV vaccine to prevent cervical cancer in women, the focus of this analysis.

Papua New Guinea is the largest Pacific Island nation and has a

* Corresponding author. Sexual and Reproductive Health Unit, Papua New Guinea Institute of Medical Research, Papua New Guinea.
E-mail address: a.kelly@unsw.edu.au (A. Kelly-Hanku).

population of over 8 million people, with more than 85% living in rural areas [23]. In this setting, preventative health services in Papua New Guinea, like the health system generally, are fragile, overstretched and often under-resourced. To date, the resource-constrained health environment of Papua New Guinea has made it difficult to establish an effective cervical cancer screening programme in a context where access to both curative and palliative treatment and care for women with cervical cancer is extremely limited. Over a 15-year period a non-governmental organisation led Pap test screening programme run in Papua New Guinea only 5% of the total estimated target population aged 30–59 years participated in the service. Because cervical specimens were sent to a laboratory in Australia for testing, up to half of those with high-grade disease needing further investigation or treatment were lost to follow up due to the time between testing and the return of results [24]. Based on this poor performance, in 2009 a Ministerial Task Force was established in Papua New Guinea and recommended the discontinuation of the Pap-based programme in 2009 [24]. In this overstretched and underperforming health system the prevention of cervical cancer remains one of the most feasible and long-term effective means by which to reduce morbidity and mortality and ultimately eliminate cervical cancer. As such, increased efforts are being made to initiate and introduce biomedical technologies and related health services to improve the detection and diagnosis of cervical cancer in Papua New Guinea while at the same time introduce the HPV vaccine.

Early branding and marketing, together with the fact that the HPV vaccine guidance was marketed primarily for the prevention of cervical cancer, mean that the HPV vaccine was only initially approved for women. Early HPV vaccination campaigns were aimed primarily at young girls and women and ‘sold’ as an anti-cervical cancer vaccine although in fact it is protective only against the acquisition of HPV, the infection that causes this cancer [19,25]. The net effect was that the vaccine came to be seen as ‘a girl’s vaccine’ [13] and fed into what was later described as the ‘feminization of HPV’ [26], thereby minimising the role it might play in the prevention of HPV-related conditions and cancers in men.

Scores of studies have been devoted to understanding and measuring acceptance and community readiness for the HPV vaccine in diverse populations [27–32], and in a diversity of different countries [11,12,18,33–37]. Such studies have generally reported high levels of acceptability and preparedness to either vaccinate oneself or ones’ child [27,28,30,33,38–43]. Despite this degree of acceptance, many other studies still point to hesitancy of vaccine uptake for the HPV vaccine, not as a cervical cancer vaccine but as the vaccine against the cervical cancer-causing agent: the net outcome of this is that the vaccine is sometimes viewed as leading to promiscuity [33,40,44,45].

The Papua New Guinean government is committed to introducing the HPV vaccine for the primary prevention of cervical cancer in women. However, locally-relevant research evidence is not available to guide implementation. To inform the future roll-out of an HPV vaccine programme in Papua New Guinea, it is essential to understand the views of the communities in which the intervention will take place in order that ‘salient mediating factors’ [46] are taken into account. In a country such as Papua New Guinea with poor access to even the most basic forms of healthcare, the HPV vaccine takes on additional importance as one of the few options available to reduce the burden of cervical cancer at a population-level. With this in mind, prior to the introduction of any new vaccine, let alone one so strongly ‘gendered’, it is essential to understand community preparedness.

Table 1
Total number of participants by gender and province.

	Eastern Highlands Province	Western Highlands Province	Milne Bay Province	TOTAL (%)
Men	29	22	10	61 (29)
Women	44	58	45	147 (71)
TOTAL	73	80	55	208 (100)

2. Methods

In order to understand community discourses about the impending introduction of the HPV vaccine for the prevention of cervical cancer in women, a multi-site mixed method qualitative study was undertaken in Papua New Guinea.

2.1. Participants, study sites and data collection

The study sites were Eastern Highlands (EHP), Western Highlands (WHP) and Milne Bay Provinces (MBP). Twenty-one gender specific focus group discussions and 82 semi-structured interviews were conducted by a researcher of the same gender across the three provinces in order to capture diversity from rural, peri-urban and urban settings, as well as ensure representation of women and men of different ages in each setting (see Table 1). Between four and seven participants participated in focus group discussions: the average number participants in the women’s focus groups was four while it was five in the men’s focus groups. No focus groups with men could be held in Milne Bay Province due to conflicting community events in the town site; in the Milne Bay Province rural site, men declined to participate given the nature of the topic.

A total of 208 participants were recruited to this study, of which 71% were women (see Table 2). Both interviews and focus groups followed a semi-structured format [see 21 for the interview guide].¹ Interviews lasted up to an hour while focus groups were between an hour and an hour and a half in duration. All participants were provided with light refreshments after the interviews; no financial incentives were paid to participants.

More than half of the participants (58%) identified themselves as married and more people identified as Seventh Day Adventist (34%) than any other religious denomination. Most study participants had achieved no more than secondary high school education (60%), with very few reporting university education or vocational training. Participants’ ethnic backgrounds and place of origin largely reflected the provinces of recruitment (EHP 31%, MBP 27% and WHP 23%) but also included other places of origin including Manus Island, the Southern Highlands, Enga, Madang and Morobe Provinces, reflecting the general mobility and migration of people in Papua New Guinea.

The use of focus group discussions and in-depth interviews allowed us to gain a range of information including both broad based community perspectives and in-depth personal narratives on acceptance. This assisted us to reach data saturation, ensuring no new ideas or issues were emerging.

We sought intentionally to recruit participants of various ages, educational and marital statuses, including parents who, if a vaccine was currently available in the country, might face the option of vaccinating their children or not. As well as young people who were slightly older than the age group that would be vaccinated, older people who could reflect on wider cultural norms and values about understandings of illness and of vaccine acceptability, and opinion leaders in communities, such as cultural leaders, were recruited to the study. All participants were purposively selected to address the study aims. Responding to community announcements about the study, participants self-selected to join the focus groups and others for an in-depth interview only.

2.2. Data analysis and management

Study data was organised and coded by one researcher (JN) with the assistance of NVivo v11 (QSR International Pty Ltd) and analysed using deductive and inductive thematic analysis [47]. Deductive coding

¹ A copy of the interview guide is also available on request from the first author.

Table 2
Number and type of interviews/discussions undertaken by gender and province.

	Eastern Highlands Province		Western Highlands Province		Milne Bay Province		TOTAL
	Semi-structured interviews	Focus group discussions	Semi-structured interviews	Focus group discussions	Semi-structured interviews	Focus group discussions	
Men	7	4	6	3	10	0	30
Women	10	5	4	7	17	4	57
TOTAL	17	9	20	10	27	4	82

HPV causes cervical cancer in women. Cervical cancer is the second most common cancer that kills women in the world. A vaccine is now available to prevent cervical cancer. However, this vaccine is not available in PNG yet, but will be in the near future. This vaccine has to be given to those who had not had sex yet, especially young girls and young boys. This vaccine will prevent girls from developing cervical cancer in the future when they become women. If given to boys it would eliminate HPV in them so they would not be able to pass it on to their wives, girlfriends and other sexual partners.

Fig. 1. HPV vaccine and cervical cancer pre-prepared script.

involved carefully reading the interview transcripts for any data pertaining to HPV and HPV vaccine knowledge, and factors influencing HPV vaccine acceptability such as gender and societal level influences. Data was also coded inductively, permitting further analysis of the meanings and experiences associated with HPV vaccine acceptability in these data. Codes and the interpretation of the data was cross-checked with research team members well versed in Papua New Guinean culture and language to ensure accuracy of analysis and therefore coding. Consensus was reached both at the stage of coding but more significantly during the interpretation and analysis of the data at the time of writing up the research findings.

Prior to the enquiry into HPV vaccine readiness, all participants were provided with up to date information on the vaccine, including the fact that it was a vaccine being considered by the Government of Papua New Guinea to be rolled out in order to prevent cervical cancer in women. Following this pre-prepared script (see Fig. 1), all participants were asked to discuss their thoughts and concerns about the introduction and the reasoning behind such beliefs.

All interviews and gender specific focus group discussions were conducted highly skilled researchers at the Papua New Guinea Institute of Medical Research and were digitally audio-recorded, transcribed verbatim and where necessary translated from *Tok Pisin* (one of three national languages) into English. All identifiable information was removed and a pseudonym allocated to each study participant.

2.3. Ethical considerations and informed consent

Written information sheets were available in both English and *Tok Pisin* and given to all potential study participants. In order to ensure that the information contained in the participant information sheets was understood by participants irrespective of their literacy level, the researcher/s explained all aspects of the sheet to them to ensure comprehension and informed consent. At this same time any questions were answered. All those agreeing to participate were required to provide written informed consent. If a participant was unable to sign, a witness signed on their behalf. Ethical approval for the conduct of this study was granted by the Papua New Guinea Institute of Medical Research Institutional Review Board (IRB), the Papua New Guinean National Department of Health Medical Research Advisory Committee (MRAC) and UNSW Sydney's Human Research Ethics Committee (HREC).

3. Results

Two primary themes emerged across the three provinces in terms of

community discourses about the HPV vaccine and preparedness for its implementation: (a) 'protecting the body and vaccination acceptance'; and (b) 'discourses of apprehension'. The majority of findings relate to the former theme.

3.1. Protecting the body and vaccine acceptance

Study findings suggest overwhelming support by participants for the introduction of the HPV vaccine to prevent HPV and cervical cancer in women. The support was not confined to girls but was seen as an important vaccine for both girls and boys. In the following discussion of this theme we highlight five important sub-themes that emerged regarding community readiness: age of vaccination; cost of the vaccine; vaccination for both girls and boys; prioritisation of vaccination and; sex, safety and promiscuity.

3.1.1. Age of vaccination

All participants were asked what age HPV vaccine would be appropriate, with a qualifier that recipients should not have already become sexually active, and therefore not exposed to HPV to that point. A variety of ages were suggested, ranging from birth to late teens, but most participants spoke of eight years being an appropriate age to start vaccinating against HPV. The reason for responses being as low as they sometimes were related to perceptions of early sexual debut in Papua New Guinea, both through sexual relations that were consensual and those that were not.

Describing non-consensual sex, one of the health care workers in an urban area in Western Highlands Province, shared stories of seeing and treating children as young as six years in his clinic with sexually transmitted infections following rape. Romeo, a young man from Goroka town in Eastern Highlands Province, was also concerned about rape and early sexual debut. He advocated that children should be vaccinated as early as possible as evident below:

I think the best age group is one year old. One year old for both male and female because now we are in the White man's world. Different kinds of pictures and mobiles, many different knowledges are coming in already and rape too is developing so I think it is best in one years old. Now the small girls and boys are raped at two or three years old. This is completely not a good thing to do so I think it is best in one-year olds.

Other participants stressed the need to vaccinate children early. Renagi, a young woman living in rural Milne Bay Province said: 'Now a day's boys and girls they start early [having sex], about 10 years old, 9 and above ... They go and they are just having sex ... I think yeah, I think 8'.

Despite the variation in age ranges offered, the vast majority of study participants supported vaccination schedules in children aged 8–14 years in order to ensure the majority of children were vaccinated prior to sexual debut to maximise the potential benefits of the vaccine.

3.1.2. Cost of the vaccine

All participants believed the vaccine should be provided free of charge, or at least at minimal cost. Evodia, a woman from a rural area of Western Highlands Province, who had undergone screening for cervical cancer at the Well Women's Clinic in Mt Hagen, said the government should take responsibility for funding any future HPV vaccine because too many women were dying from cervical cancer:

Death from cervical cancer is a serious and real outcome of the disease, the government of PNG, must have concern for us, the people. Now, it has concern for the country, then the government must provide this medicine free of charge to the people.

Others were concerned that if paying for the vaccine was a prerequisite this would prevent some parents having their children vaccinated. As expressed by Rahan, a young woman from an urban area in Milne Bay Province: 'If it's free than all the people will go up and get it, but if they are paying some won't go and get it'. The vaccine requires multiple doses so the overall cost of vaccination uptake is greater than a single dose per child. Lucy, a young woman from Goroka town, Eastern Highlands Province, explained why this could be an issue: 'We don't have jobs and we wouldn't afford to pay for those five children at the same time'.

3.1.3. Vaccinate both girls and boys

The intent to vaccinate both girls and boys for HPV was by far the most common attitude expressed with respect to who should receive the vaccine. This has important implications for changing attitudes of the vaccine being a 'girl's vaccine'. For some this was explained in terms of generalised prevention of HPV, whereby both boys and girls will be faced with the infection and transmitting the virus to each other. Many participants shared the sentiments of Audrey, from Milne Bay Province, a mother who said: 'I would want all my children to be vaccinated whether she is a girl or a boy because when they grow they will become sexually active'. She also believed that at the time of being vaccinated that they should 'get educated about this new [HPV] disease'.

One of the health narratives that circulated concerned the importance and value of boys and men in keeping the women and girls of Papua New Guinea healthy and HPV/cervical cancer free. In Milne Bay Province, one of the few matrilineal societies in the country, Tony commented that because it was men who transmit HPV to their female partners, boys should be vaccinated along with the girls. This would result in larger population coverage and the eventual elimination of HPV. For this reason, as a young man himself Tony wanted to be vaccinated. The narratives of Tony and Audrey were not unique. From the Highlands Region, Vanessa shared a similar belief as Tony, but from the perspective of a mother: 'I don't want him [my son] to pass this disease to my daughter-in-law'.

Generalised health narratives using the phrases 'won't get this disease', 'take care of them', 'protect', 'safe guard', 'build a defense' and 'remain healthy' were prevalent in participants' accounts. These discourses viewed the vaccine as being 'good for the future'. Lima, a father from Goroka town, Eastern Highlands Province explained that without the vaccine HPV would continue to spread and women will continue to die from cervical cancer, and hence he would allow both his daughters and his sons to be vaccinated:

They [boys and girls] mature and get married then this disease will still remain, and it will spread and kill them or such, that we wouldn't know. So we will still allow them [our sons and daughters] to go and get this injection to defend themselves, help them also in their future and onwards.

Illustrative of a minority perspective that possibly only boys should

be vaccinated, Rosalita, a woman living in a rural area in Eastern Highlands Province, shared: 'It may be better for the boys to get it ... You know, they will have sex with lots of women so only boys must get this medicine. In my opinion, it's better for only men to get it.' Only five of the 208 participants (all men) in this study said that they would refuse to vaccinate their sons since the HPV-related cancer – cervical cancer – only occurred in women.

3.1.4. Prioritisation of vaccination

A very high acceptability of vaccinating both girls and boys was evident. Participants were then asked to consider under what conditions, if at all, girls or boys should be prioritised over the other. Of those who were in support of vaccinating all children, a minority of participants believed that the priority should be given to girls. The importance of vaccinating girls and young women was positioned in terms of their biological and social responsibility as potential 'mothers' and child-bearing women and those who are at risk of cervical cancer. Aole, a young man living in Goroka town, Eastern Highlands Province shared:

The girls must receive this vaccine because they are highly risked. Their risk is they have the womb. In case they might face difficulties in the future or such so I think it is good of girls to get this vaccine. I've already seen how mothers die and such so for me, maybe it is good for me to take my daughter to get the vaccine.

Also from a man, the following quote from Matias, living in a rural area of the same province as Aole (above) would prioritise girls because:

they have this cervix and that they usually develop this sickness and for us men, we don't have this cervix so its best we vaccinate the girls first so that they can prevent themselves ... Then us the men.

While supportive of all children being vaccinated, a health care worker from rural Western Highlands Province identified times when some form of prioritisation may be needed, citing supply chain issues of procurement and supply. He shared that if such logistical problems were to occur, then girls should be prioritised as they are the ones at risk of cervical cancer.

A small number of participants, however, stated that boys should be given priority over girls since boys were responsible for the transmission of HPV to girls. Such beliefs related to strongly held gendered hierarchical beliefs, which prioritise boys and men as the patriarchal heads (or future heads) of the family, and with women and girls only being vaccinated afterwards. Conversely, some women believed that men should be prioritised over themselves given men's often irresponsible sexual behaviour that could place themselves at risk of being infected with HPV and then subsequently infecting their female partner who would then be at risk of developing cervical cancer.

3.1.5. Sex, safety and 'promiscuity'

In the pre-prepared script used to explain the study to participants, it was stressed that HPV is the agent responsible for the development of cervical cancer and; and that the HPV vaccine prevented the acquisition of HPV and therefore the development of cervical cancer (See Fig. 1). As is evident in other studies on HPV vaccine acceptability in which the causative agent of cervical cancer was identified, issues of sex and sexual freedom were raised. This was particularly related to the moralising of sex through the use of phrases in *Tok Pisin* which in English translate to 'promiscuous' and 'promiscuity'. Although the overall consensus was that vaccination should be supported, care should be taken to ensure that the vaccine does not give license to those vaccinated to go out and have 'a lot of sex'.

One possible adverse effect of the vaccine, at least from the perspective of some participants in each province, was a possible increase in the sale and exchange of sex. Because they are protected against HPV and cervical cancer, some women 'will want to make a lot of money by being a prostitute', said Elma, a young woman from Alotatu town in

Milne Bay Province:

Because they know that they already have taken the vaccine there will be this prostitution and we will have a lot of prostitutes around the place because they already realised that they already taken vaccine and it's preventing them from having cervical cancer. So maybe they will want to make a lot of money by being a prostitute.

A similar sentiment was also shared by Namona, a young woman in Western Highlands Province who thought 'promiscuity' would increase:

What will I say, many people can do that, they would think that are already vaccinated and are protected so they will not develop this disease and things like that, they will do it ... [Promiscuity] it would rise.

Conversely, it was the inherently 'promiscuous' nature of boys and young men that meant that other participants were in support of the vaccination of boys as shared by Melva an older woman in rural Milne Bay Province:

Boys [are more important to vaccinate] just because boys are the ones who are always out in the streets. They are always the first people to like look around or search for a lady or something like that.

Although the explanation given to participants stated that the vaccine only protected against HPV and cervical cancer, a few participants across all the sites feared those who were vaccinated would believe they were not only protected against HPV (and therefore cervical cancer) but also other infections including HIV. For example, Rose, a young woman living in a rural area in Milne Bay Province said:

The bad side I'm thinking of the girl will think she is already protected and she can go around with other man and she may go out with other man plenty of men she cannot get the sickness AIDS some of the bad sides.

Sharing a similar concern about adverse health consequences of vaccine-related 'promiscuity', Emma, also a young woman but from Alotau town in Milne Bay Province said:

The girls are alright because they are the ones that going to have that cancer but if we give to boys the boys will think it's fun and they will continue having unprotected sex and, in the end, they will get HIV and AIDS.

3.2. Discourses of apprehension

In the Highlands region, but especially in the rural study sites in this part of the country, participants expressed anxiety and apprehension about the purpose of the vaccine and the motives of 'outsiders' in introducing it. For some informants, these anxieties related to a lack of biomedical understanding while for others, personal experience of earlier childhood vaccination programmes provided grounds for suspicion. Vaccine-related apprehension sub-themes include: stories, uncertain biomedical information and side effects; the perceived lowering of children's intelligence and deceit, and infertility.

3.2.1. Stories, uncertain biomedical information and side effects

While most parents in the study reported that their own children had participated in national childhood immunisation programmes in the past, a significant number said that they did not know what the vaccinations had been for, and what their children were protected against. The problem often lay in the poor health messaging provided by health care workers at the time of immunisation. Ha, a father in the Eastern Highlands Province, described his own earlier experience of a childhood immunisation: 'The doctors came themselves and informed each village and said, "This baby immunisation is to prevent sickness"; that's all.' Similarly, Norin from Milne Bay Province remembered: 'They

[the health workers] just called us up to get the injection'.

In the absence of good quality health information, and in a culture with strong oral traditions and low literacy rates, stories are frequently relied upon to make decisions about important health practices including participating in childhood vaccination programmes. Betty, from a rural area in Eastern Highlands Province, had heard stories from others in the village that 'the baby immunisation was not good,' and had therefore not taken any of her children to be vaccinated. Lina, an older woman from Goroka also in Eastern Highlands Province, reported that no information had been given to her by health professionals at the time she needed to make a decision. In the absence of clear information, stories from families and others became influential. Hearing a story from her brother that Australia has no childhood immunisation programmes, Lina had decided against immunising her own children for any of the childhood vaccines.

Benisha, an older woman living in a rural area in the Eastern Highlands Province, advocated that in order to reduce the effects of negative and moralising stories – in the form of gossip - circulating in the community, future HPV vaccination campaigns needed to be undertaken visibly and publicly. If girls are taken away for vaccination in secret, gossip would inevitably ensue, shared Benisha:

If the whole village receives it, it's a big awareness, so they will get it ... If I secretly take them and they [the community] somehow discovered that the two girls got such protective vaccine, you know they will draw conclusions and there will be gossip.

Demonstrating the need for accurate medical information, Puke, a mother from Goroka, Eastern Highlands Province, reported that people in her village, including herself, had not vaccinated their children according to the childhood immunisation programme because of their side effects: 'They give [the injection] into one leg only. It cripples their legs or hands and such. This injection does that.'

3.2.2. Lowering of children's intelligence and deceit

Several participants in the Highland provinces expressed the belief that childhood vaccination could result in the lowering of Papua New Guinean children's intelligence. Describing herself as a 'village woman',² Rosalita from Eastern Highlands Province, was concerned that vaccinations were given to children who are 'not even sick'. The health workers do this, she said, to 'stop their knowledge' and prevent the children from developing intellectually. She said health care workers often 'mislead' and 'deceive' parents into vaccinating their children - 'They are lying to us'. From the same rural area, Lorraine reported that young people feared childhood vaccination and there were stories of children running away from school when immunisation programme providers visited. She said she had been told that the vaccines are made by outsiders who tried to destroy their children by lowering their intelligence. Health care workers were described as part of the plot to achieve this goal, viewing village women¹ as uneducated and easily fooled. Below Lorraine's narrative details this issue:

People are telling me about a vaccine. The health care workers are calling us 'village women' that because we aren't educated would wouldn't know anything about these things. These people are fooling us [into trusting the vaccine]. Some people are saying that these vaccines comes from Western countries in order to destroy us.

From the same area as Rosalita and Lorraine, Kah, a married man and father, expressed a related belief. He described how when health care workers had vaccinated children in his village it had 'destroyed the

²By using the phrase 'village woman' to describe herself, Rosalita highlights the fact that she lives in a village and has had little to no formal education. Her comments speak to the fact that she, like so many people in villages in Papua New Guinea, has little to no western understanding of the role of vaccinations to prevent disease.

children's minds'. He also described the deceit and power of outsiders who wanted to take control of Papua New Guinea, its people and its natural resources:

The whites would like to take over Papua New Guinea and they are doing this. Regarding knowledge, they would like themselves to stay superior and we Papua New Guineans be inferior [stupid with lower intelligence from vaccines], because we are a [resource] rich country.

Kingsley, an older man also from the same area explained that his sons had not participated in any of the childhood vaccination programmes provided because 'We get confused whether those people are coming for the good of us, or for the bad of us. We always ask this question'.

The tensions illustrated above speak to what Lavinia a young woman living in Mt. Hagen, Western Highlands Province described as the 'tug of war' people living in villages face: between traditional ways of thinking (and local suspicion of outsiders), knowledge shared through stories and gossip, and western biomedical concepts of disease that local people were not aware of.

3.2.3. Infertility

While not a dominant issue, a strong concern for a small number of men and women from the Highlands Region, particularly Eastern Highlands Province was the fear that the HPV vaccine would result in the spoiling of the uterus, the destruction of sperm and other complications causing infertility. For example, Puke, a woman living in Goroka town, Eastern Highlands Province, was concerned with female infertility and said, 'It will block the vagina and she would not have children'. On the other hand Evodia, a woman living in a rural area of Western Highlands Province, spoke of concern for male infertility and said, 'This vaccine could prevent the boys from producing sperm'. Infertility is a serious health issue with socio-cultural ramifications in a country where reproduction and having children to continue the family line is so important.

4. Discussion

Findings from of this study highlight important aspects of community discourse and preparedness for the proposed introduction of the HPV vaccine to prevent cervical cancer in Papua New Guinea. A concern among study participants related to age of immunization and, as in other settings [33,34,46], the potential cost of the vaccine, particularly among parents who might need to pay for the vaccine for not one but multiple children.

Of significance was the fact that participants of all ages, across all provinces and sites and both women and men were overwhelmingly supportive of vaccination both for girls and boys against HPV, even though cervical cancer only manifests itself in women. Participants could see and advocated for the value of preventing the forward transmission of the cancer-causing STI within the community, and not just the prevention of cervical cancer in women.

While there was broad community readiness for the HPV vaccine, this was accompanied by concern regarding a possible increase in sexual risk behaviour, in the sense of vaccination appearing to give young people in general, and girls in particular, license to have sex [14–16]. This was viewed as likely to enhance other sexual health risks, including STIs including HIV [16].

A number of factors were identified as influencing people's lack of willingness to accept an HPV vaccine. These included fear and mistrust of outsiders, especially those such as health care workers, who were seen as creating sickness within the community [12]. In the light of such anxieties, participants recommended however that any future vaccination programme be conducted openly and transparently, with attention being given to good face-to-face communication, and with the fears of local people being engaged with and treated with respect.

As new biomedical technologies such as vaccines are introduced into different cultural contexts, the meanings ascribed to them and the responses they incite are transformed through local engagement. The Papua New Guinean government is committed to introducing the HPV vaccine for primary prevention and this study provides the first locally-relevant research evidence with which to guide implementation. Experience from earlier health programmes and research in the country, reinforced by the findings from this study, signal the importance of serious engagement with local health cosmologies if an HPV vaccination programme is to succeed. Central to success will be engagement with and respect for local cultures and beliefs about health and illness [48]. In particular, attention needs to be given to how 'outsiders' are likely to be perceived by those that community vaccination programmes seek to reach.

In a country such as Papua New Guinea, community beliefs and fears about vaccination and other health interventions cannot be simply dismissed as illogical but need to be addressed in ways that speak to local people's experience and understanding. A first step must be to counter stories spreading misinformation and moralisation by other accounts which provide accurate information about what it is that HPV vaccination seeks to achieve [49] as well to provide the relevant and evidence-informed messages about the vaccine [22]. Community education has a key role to play in this respect, but it is important too to change the culture of vaccination programmes, too many of which have in the past adopted a top-down approach with information not being provided to participants in the mistaken belief that they cannot (or will not) understand.

As with all studies limitations exist, and for this study these include the poor pre-existing knowledge of HPV and of cervical cancer. While we provided information in the form of the pre-prepared script, people were not in a position to have necessarily developed beliefs and views on the acceptance of the vaccine over time and as a result of exposure to other information. However, based on the rigour of our data, the diversity of people recruited and the various sites included the authors of this paper believe this is unlikely and therefore the limitation minimal. Moreover, based on the fact that a national HPV messaging campaign has not been developed for Papua New Guinea, these findings are likely to reflect the values, beliefs and concerns in situ when people are afforded the opportunity to be vaccinated, or have their daughters vaccinated for the first time.

Failure to attend to context, the local milieu, dynamics of power and local versus western biomedical cosmologies will likely result in the failure of a future HPV programme, especially in communities where fear of outsiders and the tug of war between conflicting sources of beliefs is real. At best, it may result in a failure to engage communities, but at worst it may trigger outright opposition and resistance. That said, the overwhelming support for the vaccine highlights that communities in Papua New Guinea believe that an HPV vaccine programme has much to offer young girls and boys in the country. Study participants saw the value of the vaccine as both as a means to prevent HPV infection in both girls and boys and as a tool for the prevention of cervical cancer in women. In this way they were in support of maximising the benefits of the vaccine to more than just girls.

Author contribution

AKH, LMV and AJV designed this study. AKH oversaw the implementation, data analysis and co-drafted the manuscript. JN conducted the data analysis and with AKH drafted the manuscript. SA and HA collected the data used in the manuscript. PA, SA, HA, LMV, PJT, GDLM, JMK and AJK provided feedback on draft of the manuscript. All authors agreed to the final draft for submission.

Funding

This work was funded by a small grant from the Government of Australia's aid program in Papua New Guinea.

Role of the funding source

Funding for this study was provided by a small grant from the Australian Government but it had no role in the design, collection or analysis of the data and the implications of the findings for policy and health promotion. AKH was funded by a UNSW Scientia Fellowship to write this manuscript.

Data statement

The research data is confidential.

Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.pvr.2019.100171>.

References

- [1] F.E. Andre, et al., Vaccination greatly reduces disease, disability, death and inequity worldwide, *Bull. World Health Organ.* 86 (2) (2008) 140–146 <https://doi.org/10.2471/BLT.07.040089>.
- [2] M. Leach, J. Fairhead, *Vaccine Anxieties: Global Science, child health and society, Earthscan, London, 2007*.
- [3] G.A. Poland, R.M. Jacobson, The age-old struggle against antivaccinationists, *N. Engl. J. Med.* 364 (2011) 97–99 <https://doi.org/10.1056/NEJMp1010594>.
- [4] H.J. Warraich, Religious opposition to polio vaccine, *Emerg. Infect. Dis.* 15 (2009) 978.
- [5] M. Lock, V.K. Nguyen, *An Anthropology of Biomedicine*, Wiley-Blackwell, Oxford, 2010.
- [6] D. Lupton, *The Imperative of Health: Public Health and the Regulated Body*, Sage, London, 1995.
- [7] P.F. Savelsberg, F.T. Ndonko, B. Schmidt-Ehry, Sterilizing vaccines or the politics of the womb: retrospective study of a rumor in the Cameroon, *Med. Anthropol. Q.* 14 (2000) 159–179 <https://doi.org/10.1525/maq.2000.14.2.159>.
- [8] D. Arnold (Ed.), *Imperial Medicine and Indigenous Societies*, Manchester University Press, Manchester UK, 1998.
- [9] A. Appadurai, Disjuncture and difference in the global cultural economy, *Theor. Cult. Soc.* 7 (1990) 295–310 <https://doi.org/10.1177/026327690007002017>.
- [10] S. Reynolds Whyte, S. Van der Geest, A. Hardon, *Social Lives of Medicines*, Cambridge University Press, Cambridge, UK, 2002.
- [11] F. Towghi, The biopolitics of reproductive technologies beyond the clinic: localizing HPV vaccines in India, *Med. Anthropol.* 32 (4) (2013) 325–342 <https://doi.org/10.1080/01459740.2013.769976>.
- [12] C.A. Pop, Locating purity within corruption rumors: narratives of HPV vaccination refusal in a peri-urban community of southern Romania, *Med. Anthropol. Q.* 30 (4) (2016) 563–581 <https://doi.org/10.1111/maq.12290>.
- [13] A. Mishra, J.E. Graham, Risk, choice and the 'girl vaccine': unpacking human papillomavirus (HPV) immunisation, *Health Risk Soc.* 14 (1) (2012) 57–69 <https://doi.org/10.1080/13698575.2011.641524>.
- [14] L. Mamo, S. Epstein, The pharmaceuticalization of sexual risk: vaccine development and the new politics of cancer prevention, *Soc. Sci. Med.* 101 (2014) 155–165 <https://doi.org/10.1016/j.socsmed.2013.11.028>.
- [15] J. Colgrove, The ethics and politics of compulsory HPV vaccination, *N. Engl. J. Med.* 355 (2006) 2390–2391 <https://doi.org/10.1056/NEJMp068248>.
- [16] M.J. Casper, L.M. Carpenter, Sex, drugs, and politics: the HPV vaccine for cervical cancer, *Sociol. Health Illness* 30 (6) (2008) 886–899 <https://doi.org/10.1111/j.1467-9566.2008.01100.x>.
- [17] R. McKie, Fears for women's health as parents reject HPV vaccine: three nations blame social media for fall in number of girls given cervical cancer jabs, *The Guardian, Int. Ed.* (3 December 2017), <https://www.theguardian.com/society/2017/dec/03/hpv-vaccine-fears-women-health-take-up-falls>.
- [18] C. Craciun, A. Baban, 'Who will take the blame?': understanding the reasons why Romanian mothers decline HPV vaccination for their daughters, *Vaccine* 30 (2012) 8789–8793 <https://doi.org/10.1016/j.vaccine.2012.09.016>.
- [19] S.D. Gottlieb, *Not Quite a Cancer Vaccine: Selling HPV and Cervical Cancer*, Rutgers University Press, New Brunswick, NJ, 2018.
- [20] IARC GLOBOCAN, Cervix uteri fact sheet 2018, Available at: <http://gco.iarc.fr/today/data/factsheets/cancers/23-Cervix-uteri-fact-sheet.pdf>.
- [21] A. Kelly-Hanku, et al., Ambiguous bodies, uncertain diseases: knowledge of cervical cancer in Papua New Guinea, *Ethn. Health* 23 (6) (2017) 1–23 <https://doi.org/10.1080/13557858.2017.1283393>.
- [22] A. Kelly-Hanku, et al., Health communication messaging about HPV vaccine in Papua New Guinea, *Health Educ. J.*, (In Press).
- [23] World Bank, Rural Population (% of total population), World Bank Open Data, The World Bank, 2018, <https://data.worldbank.org/indicator/sp.rur.totl.zs>.
- [24] G. Mola, et al., *Final Report of the Ministerial Task Force on Prevention and Treatment of Cancer of the Cervix in PNG*, Government of Papua New Guinea, Port Moresby, 2009.
- [25] C. Davies, K. Burns, Mediating healthy female citizenship in the HPV vaccination campaigns, *Fem. Media Stud.* 14 (5) (2014) 711–726 <https://doi.org/10.1080/14680777.2013.830632>.
- [26] E.M. Daley, et al., The feminization of HPV: how science, politics and gender norms shaped U.S. HPV vaccine implementation, *Papillomavirus Res.* 3 (2017) 142–148 <https://doi.org/10.1016/j.pvr.2017.04.004>.
- [27] B. Brown, et al., Peruvian FSWs: understanding HPV and barriers to vaccination, *Vaccine* 28 (49) (2010) 7743–7747 <https://doi.org/10.1016/j.vaccine.2010.09.063>.
- [28] P. Dursun, et al., Women's knowledge about human papillomavirus and their acceptance of HPV vaccine, *Aust. N. Z. J. Obstet. Gynaecol.* 49 (2) (2009) 202–206 <https://doi.org/10.1111/j.1479-828X.2009.00947.x>.
- [29] I. Katz, et al., A qualitative analysis of factors influencing HPV vaccine uptake in Soweto, South Africa among adolescents and their caregivers, *PLoS One* 8 (8) (2013) e72094 <https://doi.org/10.1371/journal.pone.0072094>.
- [30] P.W. Lee, et al., Beliefs about cervical cancer and human papillomavirus (HPV) and acceptability of HPV vaccination among Chinese women in Hong Kong, *Prev. Med.* 45 (2–3) (2007) 130–134 <https://doi.org/10.1016/j.ypmed.2007.07.013>.
- [31] C. Davies, et al., 'Is it like one of those infectious kind of things?' The importance of educating young people about HPV and HPV vaccination at school, *Sex. Educ.* 17 (3) (2017) 256–275 <https://doi.org/10.1080/14681811.2017.1300770>.
- [32] A. McClelland, P. Liamputtong, Knowledge and acceptance of human papillomavirus vaccination: perspectives of young Australians living in Melbourne, Australia, *Sex. Health* 3 (2) (2006) 95–101 <https://doi.org/10.1071/SH05035>.
- [33] N.T. Brewer, K.I. Fazekas, Predictors of HPV vaccine acceptability: a theory-informed, systematic review, *Prev. Med.* 45 (2) (2007) 107–114 <https://doi.org/10.1016/j.ypmed.2007.05.013>.
- [34] P.A. Newman, et al., HPV vaccine acceptability among men: a systematic review and meta-analysis, *Sex. Transm. Infect.* 89 (7) (2013) 568–574 <https://doi.org/10.1136/sextrans-2012-050980>.
- [35] S.J. Kessels, et al., Factors associated with HPV vaccine uptake in teenage girls: a systematic review, *Vaccine* 30 (24) (2012) 3546–3556 <https://doi.org/10.1016/j.vaccine.2012.03.063>.
- [36] S. Perlman, et al., Knowledge and awareness of HPV vaccine and acceptability to vaccinate in sub-Saharan Africa: a systematic review, *PLoS One* 9 (3) (2014) e90912 <https://doi.org/10.1371/journal.pone.0090912>.
- [37] M.S. Cunningham, C. Davison, K.J. Aronson, HPV vaccine acceptability in Africa: a systematic review, *Prev. Med.* 69 (2014) 274–279 <https://doi.org/10.1016/j.ypmed.2014.08.035>.
- [38] M.A. Coleman, J. Levison, H. Sangi-Haghpeykar, HPV vaccine acceptability in Ghana, West Africa, *Vaccine* 29 (23) (2011) 3945–3950 <https://doi.org/10.1016/j.vaccine.2011.03.093>.
- [39] J.K. Oh, et al., Awareness of and attitude towards human papillomavirus infection and vaccination for cervical cancer prevention among adult males and females in Korea: a nationwide interview survey, *Vaccine* 28 (7) (2010) 1854–1860 <https://doi.org/10.1016/j.vaccine.2009.11.079>.
- [40] D. Rosenthal, et al., Challenges to accepting a human papilloma virus (HPV) vaccine: a qualitative study of Australian women, *Women Health* 45 (2) (2007) 59–73 https://doi.org/10.1300/J013v45n02_04.
- [41] J. Waller, L.A.V. Marlow, J. Wardle, Mother's attitudes towards preventing cervical cancer through human papillomavirus vaccination: a qualitative study, *Cancer Epidemiol. Biomarkers* 15 (2006) 1257–1261 <https://doi.org/10.1158/1055-9965.EPI-06-0041>.
- [42] L. Brabin, et al., Future acceptance of adolescent human papillomavirus vaccination: a survey of parental attitudes, *Vaccine* 24 (16) (2006) 3087–3094 <https://doi.org/10.1016/j.vaccine.2006.01.048>.
- [43] N.A. Constantine, P. Jerman, Acceptance of human papillomavirus vaccination among Californian parents of daughters: a representative statewide analysis, *J. Adolesc. Health* 40 (2) (2007) 108–115 <https://doi.org/10.1016/j.jadohealth.2006.10.007>.
- [44] G.D. Zimet, Improving adolescent health: focus on HPV vaccine acceptance, *J. Adolesc. Health* 37 (2005) S17–S23 <https://doi.org/10.1016/j.jadohealth.2005.09.010>.
- [45] K. Davis, et al., Human papillomavirus vaccine acceptability among parents of 10- to 15-year-old adolescents, *J. Low. Genit. Tract Dis.* 8 (3) (2004) 188–194 <https://doi.org/10.1097/01.ogx.0000143866.29509.50>.
- [46] L. Rambout, et al., Self-reported barriers and facilitators to preventive human papillomavirus vaccination among adolescent girls and young women: a systematic review, *Prev. Med.* 58 (2014) 22–32 <https://doi.org/10.1016/j.ypmed.2013.10.009>.
- [47] V. Braun, V. Clarke, Using thematic analysis in psychology, *Qual. Res. Psychol.* 3 (2) (2006) 77–101 <https://doi.org/10.1191/1478088706qp0630a>.
- [48] L.K. Ko, et al., 'We brought our culture here with us': a qualitative study of perceptions of HPV vaccine and vaccine uptake among East African immigrant mothers, *Papillomavirus Res.* 7 (2019) 21–25 <https://doi.org/10.1016/j.pvr.2018.12.003>.
- [49] N. Howard, et al., What works for human papillomavirus vaccine introduction in low and middle-income countries? *Papillomavirus Res.* 4 (2017) 22–25 <https://doi.org/10.1016/j.pvr.2017.06.003>.