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A study of physicians’ experiences with recommending HPV vaccines to adolescent boys

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ABSTRACT
Assessing physicians’ experiences in HPV vaccine recommendation and delivery to adolescent boys is essential to providing an understanding of the issues of vaccine acceptance and an insight for policymakers to enhance HPV vaccinations among adolescent boys. Between January and April 2014 a mail survey was conducted using physicians in Malaysia known to provide either one or both HPV vaccine (Gardasil and Cervarix) immunisation services. A total of 357 completed questionnaires were received (response rate 22.5%). Of these, 335 physicians see adolescent boys aged 11 to 18 years old in their practice. Only 26.3% (n = 88) recommended the HPV vaccine to these boys. A total of 46.6% (n = 41) have successfully given the HPV vaccine to adolescent boys. A lack of proper guidelines from the health authorities regarding the recommendation of HPV vaccine to the boys (37.2%) and a lack of awareness of the availability of the vaccine for boys (32.8%) were the most commonly cited reasons for non-recommendation.

IMPACT STATEMENT
• Recommending the HPV vaccine for adolescent boys remains a challenge for physicians. Our study provides evidence of challenges and barriers faced by Malaysian physicians who recommend the HPV vaccines (Gardasil and Cervarix) in their practices. In this study, physicians reported HPV vaccine uptake by adolescent boys was very poor.
• A lack of proper guidelines from the health authorities regarding the recommendation of HPV vaccine to boys and a lack of awareness of the availability of the vaccine for boys were the most commonly cited reasons for non-recommendation.
• Physicians viewed that support and encouragement from the health authorities are needed to promote the recommendation of the HPV vaccine to adolescent boys.
• Physicians were also of the opinion that the lay public should be educated about the availability of the HPV vaccine for boys, and its benefits, safety and efficacy, and the high susceptibility of boys to getting HPV infections.
• The findings provide insights that could be helpful to policymakers or high-level decision-makers of the potential strategies to enhance HPV uptake among adolescent boys.

Introduction
HPV (human papilloma virus) infections may cause various adverse health outcomes in males, including genital warts and oral, anal and penile cancers (Lacey et al. 2006). Among ASEAN countries, Malaysia is the third country after Cambodia and Brunei with the highest reported incidence and mortality rates (per 100,000 population) of mouth and oropharynx cancer in males (12.9 and 7.1, respectively) (Ferlay et al. 2010). A review of the epidemiology of oral cancer in Asia from 2000 to 2012 reported that besides diet, HPV is the single main risk factor (Rao et al. 2013). A global review on the age-specific prevalence of HPV in males by Smith et al. (2011) indicated that HPV prevalence in men, as compared to women, peaks at slightly older ages and remains constant or slightly decreases as age increases.

In October 2009, the United States (US) Food and Drug Administration (FDA) approved the quadrivalent HPV vaccine (4vHPV) covering types 6, 11, 16 and 18, for males aged 9 to 26. A few weeks later, a provisional permissive recommendation of a 3-dose vaccine series for this group was made by the Advisory Committee on Immunization Practices (ACIP), essentially excluding it from the routine vaccination schedule. In 2011, once there was evidence available that 4vHPV prevented anal cancer, the ACIP changed to a routine recommendation for 11–21-year-old
males. In males and females, 4vHPV is indicated for the prevention of genital warts and anal cancers, while in females it is also indicated for the prevention of cervical, vaginal and vulvar cancers (Centres for Disease Control and Prevention 2010). A study by Elbasha and Dasbach (2010) reported that vaccinating this group against HPV would give economic and public health benefits as well as individual health benefits. While Australia was the first country to publicly fund universal HPV vaccination (the quadrivalent vaccine Gardasil) for boys in 2013, the US offered the vaccination to boys through private health services and through the publicly funded Vaccines for Children (VFC) programme (Durrheim et al. 2007).

It has been more than eleven years since 2006, when the prophylactic HPV vaccine was licenced in Malaysia, recommended for routine use in girls aged 11 to 12 years old, and permissively used in girls aged 9 to 10 and young women 13 through to 26 years old. Although the HPV vaccine was officially approved in November 2006 for males too, it was only available in private health services. To date, there is no guideline by the Ministry of Health of Malaysia for recommendation of HPV vaccines for boys in Malaysia. Due to the increase in sexual activity among Malaysian youth, which may result in higher rates of HPV infections, the approval of HPV vaccines for males could provide great benefits (Ezat and Aljunid 2010).

One of the most important factors leading to a decision to be HPV-vaccinated is physician advocacy (Dinh et al. 2007; Wong 2009a, 2009b, Redhwan Ahmed 2012). Through their repeated contacts with parents, the physician as a provider has the potential to produce sustained improvements in HPV vaccination rates (Perkins et al. 2015). Physician recommendation influences parents’ decision-making regarding allowing their children to receive the HPV vaccination (Dinh et al. 2007). Moreover, it is critical for a physician to give recommendations or motivation when adolescents or parents are deciding about HPV vaccination (Mortensen 2010; Alexander et al. 2012; Gilkey et al. 2012; Perkins and Clark 2012). By providing vaccine counselling, which focuses on HPV vaccine availability, the direct benefits for adolescent males and the indirect benefit for females, the physician may increase HPV vaccine acceptance among parents, thus leading to increased HPV vaccination rates (Kurhana et al. 2015).

We have previously conducted a study on physician experiences with the recommendation of the HPV vaccine to adolescent girls (Wong 2009a). Now that the HPV vaccine is also recommended for boys, little is known about physicians’ experiences in recommending the HPV vaccine to adolescent boys. The barriers to recommending the HPV vaccine to boys warrant further study. Therefore, the objectives of this study are to determine:

1. the prevalence of HPV vaccine recommendation to adolescent boys;
2. the characteristics of physicians who recommend the HPV vaccine; and
3. the physicians’ attitudes towards and barriers to recommending the HPV vaccine.

### Materials and methods

#### Study design and subjects

The survey was conducted between January 2014 and April 2014. The sample used in this survey was all physicians in Malaysia known to provide either one or both HPV vaccine (Gardasil and Cervarix) immunisation services. A total of 1587 physicians (all in private practices), known to purchase and deliver the HPV vaccines to their patients, were identified throughout the country. The questionnaire, an information sheet explaining the objectives of the study and a consent form were sent by mail to each participant. They were requested to return the consent form together with the completed questionnaire using the stamped addressed envelope provided. The participants were followed-up one and two weeks after the survey was sent out, by faxing reminder letters and making phone calls to ensure they had received the questionnaire and requesting them to respond.

Researchers constructed a 23-item questionnaire consisting of participant background (6 items), experiences with HPV vaccine recommendation to adolescent boys aged 11 to 18 years old (14 items) and attitudes towards HPV vaccination in adolescent boys aged 11 to 18 years old (3 items). The questionnaire was face-validated by a panel of experts. Finally, the questionnaire was pilot-tested.

#### Statistical analysis

Pearson’s chi-square test was used for dichotomous variables. Multivariate logistic regression was used to identify factors associated with ‘Have ever given HPV vaccine to adolescent boys aged 11–18’. In the modelling strategy, the independent variables were included in the model if they had a $p$ of < .05 on univariate analysis using the “Enter” method. All statistical analyses were performed using SPSS 16.0 (SPSS Inc., Chicago, IL). In all analyses, a $p$-value of less than .05 was considered statistically significant.

#### Ethical consideration

The study was approved by the Medical Ethics Committee, University Malaya Medical Centre, Kuala Lumpur, Malaysia (IRB NO: 968.3).

#### Results

Figure 1 shows the flow chart of the recruitment process. Out of 1587 mailed questionnaires, a total of 357 completed questionnaires were received. The response rate, computed as the number of completed questionnaires received divided by the number of mailed questionnaires, was 22.5%. Of the 1230 non-responders, 584 responded that they were not interested in participating in this study and had no time to complete the questionnaire. The remaining 646 did not return the questionnaire despite follow up.

Table 1 provides the socio-demographic characteristics and proportion of physicians that had ever recommended the HPV vaccine to adolescent boys aged 11 to 18 years old,
Table 1. Socio-demographic characteristics of physicians surveyed and their recommendation of HPV vaccine to adolescent boys aged 11–18.

<table>
<thead>
<tr>
<th></th>
<th>Overall N = 335</th>
<th>Have recommended HPV vaccine to adolescent boys aged 11–18 n (%)</th>
<th>Overall N = 88</th>
<th>Have ever given HPV vaccine to adolescent boys aged 11–18 n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes n = 88</td>
<td>No n = 247</td>
<td>Yes n = 41</td>
<td>No n = 47</td>
</tr>
<tr>
<td>Age group (years old)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>29–44</td>
<td>87 (26.0)</td>
<td>17 (19.5)</td>
<td>17 (19.3)</td>
<td>6 (35.3)</td>
</tr>
<tr>
<td>45–59</td>
<td>165 (49.2)</td>
<td>43 (26.1)</td>
<td>122 (73.9)</td>
<td>43 (48.9)</td>
</tr>
<tr>
<td>60–74</td>
<td>83 (24.8)</td>
<td>28 (33.7)</td>
<td>55 (66.3)</td>
<td>28 (31.8)</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>228 (68.1)</td>
<td>56 (24.6)</td>
<td>172 (75.4)</td>
<td>56 (63.6)</td>
</tr>
<tr>
<td>Female</td>
<td>107 (31.9)</td>
<td>32 (29.9)</td>
<td>75 (70.1)</td>
<td>32 (36.4)</td>
</tr>
<tr>
<td>Ethnicity</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Malay</td>
<td>64 (19.1)</td>
<td>8 (12.5)</td>
<td>56 (87.5)</td>
<td>8 (9.1)</td>
</tr>
<tr>
<td>Chinese</td>
<td>185 (55.2)</td>
<td>54 (29.2)</td>
<td>131 (70.8)</td>
<td>54 (61.4)</td>
</tr>
<tr>
<td>Indian</td>
<td>80 (23.9)</td>
<td>25 (31.2)</td>
<td>55 (68.8)</td>
<td>25 (28.4)</td>
</tr>
<tr>
<td>Others</td>
<td>6 (1.8)</td>
<td>1 (16.7)</td>
<td>5 (83.3)</td>
<td>1 (1.1)</td>
</tr>
<tr>
<td>Number of years in practice</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>≤20</td>
<td>160 (47.8)</td>
<td>35 (21.9)</td>
<td>125 (78.1)</td>
<td>35 (39.7)</td>
</tr>
<tr>
<td>21–30</td>
<td>110 (32.8)</td>
<td>29 (26.4)</td>
<td>81 (73.6)</td>
<td>29 (33.0)</td>
</tr>
<tr>
<td>≥31</td>
<td>65 (19.4)</td>
<td>24 (36.9)</td>
<td>41 (63.1)</td>
<td>24 (37.3)</td>
</tr>
<tr>
<td>Locality of clinic</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Urban</td>
<td>206 (61.5)</td>
<td>60 (29.1)</td>
<td>146 (70.9)</td>
<td>60 (68.2)</td>
</tr>
<tr>
<td>Rural</td>
<td>129 (38.5)</td>
<td>28 (21.7)</td>
<td>101 (78.3)</td>
<td>28 (31.8)</td>
</tr>
</tbody>
</table>

Figure 1. Illustration of recruitment process for the survey (n = 357).
and had ever given the HPV vaccine to adolescent boys aged 11 to 18 years old. Out of 357 respondents in the survey, 335 (93.8%) had seen adolescent boys aged 11 to 18 years old in practice, while 22 (6.2%) had not seen any. Out of the total of 335 physicians who had seen adolescent boys aged 11 to 18 years old in their practice, only 26.3% (n = 88) had recommended the HPV vaccine to the boys and 73.7% (n = 247) had not recommended it. There was no statistically significant association between the recommendation of HPV vaccines to adolescent boys aged 11 to 18 years old by age group, gender, number of years in practice or locality of clinic. The study found a higher proportion of Indian physicians (31.2%, \( p = .039 \)) had recommended HPV vaccines to adolescent boys aged 11 to 18 years old compared to other races.

Out of 88 physicians who had recommended the HPV vaccine to adolescent boys aged 11 to 18 years old, only 46.6% (n = 41) had ever successfully given the HPV vaccine while 53.4% (n = 47) of physicians reported that they had never given the vaccine to adolescent boys. No statistically significant relationship was found between giving the vaccine to adolescent boys aged 11 to 18 years old by age group, gender or ethnicity of physician. Physicians who have been practising for 21 to 30 years (62.1%, \( p = .024 \)) and who work in urban areas (58.3%, \( p = .001 \)) were significantly more likely to have successfully given the HPV vaccine (adolescent boys administered the vaccine) to adolescent boys aged 11 to 18 years old. The results of multivariate logistic analysis showed that numbers of years in practice and locality of clinic were still significantly associated to having successfully given the HPV vaccine to adolescent boys aged 11 to 18 years old.

Physicians who did not recommend the HPV vaccine for adolescent boys were directed to answer an open-response question that asked for the reason why they did not make the recommendation. Table 2 summarises the findings from the open-response question. The most common feedback reported was a lack of proper guidelines from the Ministry of Health in Malaysia regarding the recommendation of the HPV vaccine to teenage boys. Secondly, many noted that they lacked awareness of the availability of the HPV vaccine for boys. Other reasons included the perception that vaccinating boys is not as cost-effective as vaccinating girls for reducing cervical cancer, and a lack of awareness among parents, which led them to recommend the vaccine only reluctantly. Out of 357 physicians, the majority (70.0%) agreed that the HPV vaccine should be given to adolescent boys. Most of them (82.3%) agreed that the vaccine is effective in preventing genital warts and anal cancers in Malaysia. The majority (55.2%) agreed that the HPV vaccination should be mandatory for all adolescent boys in Malaysia (Table 2).

Physicians were also asked about the most frequently asked questions by parents of adolescent boys about the vaccine, ‘Is the vaccine safe?’ was the most frequent question asked (Table 3). The second most frequent questions were ‘How effective is the vaccine?’ (28.4%) and ‘How long does immunity last after getting the vaccine?’ (25.0%). Regarding the key factors influencing parents’ decisions to vaccinate their teenage boys, the desire to protect their children was cited as the key factor by more than half of the study participants (52.3%) and as the second key factor by a further 25.0% of the study participants (25.0%) (Table 4).

As shown in Table 5, the majority of physicians believed that the first key barriers to offering the vaccine were the cost of vaccination (46.6%), perceived lack of susceptibility to HPV infection (19.3%), concern about the safety of the vaccine (13.6%), concern about side effects of vaccination (5.7%), self-stigma of being labelled as sexually active or practising high-risk sexual behaviour (5.7%) and concern about the efficacy of the vaccine (2.3%). Only 6.8% had no idea or did not know about the key barriers to vaccination acceptance when recommending vaccines to adolescent boys.
Discussion

In this study, the majority of physicians did not recommend the HPV vaccine to boys aged 11 to 18 years old in their practices. This indicates that efforts should focus on encouraging Malaysian physicians to routinely recommend the HPV vaccine to adolescent boys. The open responses in this study yielded important insights into how to increase recommendations. In particular, our study participants noted that there are no official guidelines from the Ministry of Health of Malaysia regarding the administration of the HPV vaccine to adolescent boys. This implies that the government should update its guidelines to align with the new recommendation of offering the HPV vaccine to adolescent boys. Furthermore, many of the HPV-recommending physicians were not aware that the HPV vaccine is now available for adolescent boys. Physicians also showed concern that many parents lack awareness of the HPV vaccine for boys and are thus reluctant to recommend it for them. Therefore, raising awareness that the HPV vaccine is now also recommended for adolescent boys is essential for both HPV-recommending physicians and the general public. It is also important to correct the misperception that vaccinating boys is not cost-effective. For instance, a recent study found that HPV vaccination for boys aged 12 years may be a cost-effective strategy for the prevention of oropharyngeal cancer (Graham et al. 2015). The physicians in this study also noted that the high price of the vaccine limits their recommendations. In our previous study, the price of the HPV vaccine was shown to be a barrier to vaccination among adolescent girls (Redhwan Ahmed 2012); now that the vaccine is recommended for adolescent boys as well, the price factor remains an important issue. The price of the vaccine should be reduced in order to enhance the number of successful recommendations.

Among the physicians who reported recommending the HPV vaccine to adolescent boys, slightly less than half successfully gave the vaccine to boys. Physicians with a higher number of years’ work experience had a significantly higher success rate in male HPV vaccination. Findings imply that physicians with less experience should be the target group to improve the effectiveness of recommendation efforts. Furthermore, a higher percentage of physicians who work in urban areas report giving the HPV vaccine to adolescent boys aged 11 to 18 years old, than physicians who work in rural areas. This might be associated with higher numbers of high-income parents in urban areas. In Malaysia, as reported in 2014, mean household income in urban and rural areas was RM 6883 and RM 3831, respectively (Department of Statistics Malaysia 2014). Urban communities can better afford to get their sons vaccinated with the HPV vaccine compared to parents in rural areas, which has the potential to produce substantial health disparities related to diseases caused by HPV. Subsidising HPV vaccination for clinics in the rural settings would perhaps increase the HPV vaccine uptake rate.

Despite the poor recommendations in practice, the physicians in this study did express some positive attitudes towards the HPV vaccine for adolescent boys. Many would favour a mandatory HPV vaccine for adolescent boys in Malaysia. A previous study of the attitudes of physicians towards the HPV vaccine for males likewise showed that many supported the concept of vaccinating males and acknowledged its benefits for both sexes (Weiss et al. 2010). This therefore implies that efforts to improve physician recommendation should target issues identified in this study, such as lack of information, emphasis from the local authorities or policymakers about the HPV vaccines for adolescent males, and lack of public or parental awareness that the HPV vaccine is now available for males and is beneficial for both sexes (Weiss et al. 2010).

The likelihood of adolescent boys receiving the vaccine very much depends on parental perception. In this study, physicians reported that parents frequently asked about the safety and effectiveness of the vaccine and the duration of the immunity against HPV after last being vaccinated. Likewise, in previous studies, concern for vaccine safety was found to be parents’ top concern (Gust et al. 2008; Laz et al. 2012). Findings from the recent US National Immunization Survey-Teen revealed that among parents not intending to have their child vaccinated against HPV in the next year, the percentage of parents citing safety concerns/side effects with respect to HPV increased from 4.5% in 2008 to 16.4% in 2010 (Darden et al. 2013). Previous studies have shown parents’ beliefs about the effectiveness of the vaccine have been associated with vaccination uptake (Reiter et al. 2010; Smith et al. 2011; Forster et al. 2012). Reiter et al. (2011) reported that parents’ intentions to vaccinate sons were higher if parents perceived greater effectiveness of the vaccine or if they anticipated that they would regret not vaccinating if their son developed HPV. Therefore, HPV-recommending physicians should equip themselves with accurate information about the safety, efficacy and duration of immunity, among others, in order to ameliorate parental concerns about the HPV vaccine.

Vaccine manufacturers should provide physicians with up-to-date information or findings from their ongoing research in order for physicians to recommend the HPV vaccine in a more convincing manner.

Our study identified two key important factors influencing parents’ decisions to vaccinate their boys aged 11 to 18 years old. The desire to protect their children was the first most important factor, as found in other studies. Studies of parents and their adolescent sons’ perspectives on the vaccine found that both groups viewed the most important factor for vaccine uptake as the protection of the son against the consequences of sexually transmitted HPV, more than the indirect protection of women against cervical cancer (Ferris et al. 2009; Alexander et al. 2012; Khurana et al. 2015). These results underline the importance of the physician emphasizing that the HPV vaccine for adolescent boys may protect them against the consequences of HPV infection, rather than simply protecting their future partners against cervical cancer. Physicians in this study identified the second most important motivator of vaccination as parental belief in the physician’s opinion. Many previous studies reported that physicians play a crucial role in the dissemination of information needed by parents to make an informed choice about HPV vaccination for their sons (Davis et al. 2004; Ferris et al. 2009; Mortensen 2010; Rand et al. 2010; Warner et al. 2015; Niccolai et al. 2016). As only 28% of the physicians in this study reported
ever having recommended the vaccine to parents of adolescent boys, it is crucial to encourage physicians to start routinely recommending HPV vaccination in their practices. Other identified reasons for not recommending—namely, lack of guidelines from the ministry and a lack of publicity, as noted above—also need to be addressed.

In Malaysia, cost was a barrier against HPV vaccine uptake for adolescent girls before the vaccine was given for free in the school-based HPV vaccination programme, which started in 2007 (Woo et al. 2012). Now that the vaccine is also available for adolescent boys, cost remains a challenge. Currently, the school-based HPV vaccination programme providing free HPV vaccination to 13-year-old female students does not include adolescent boys. Parents of adolescent boys have to pay if they want the vaccine for their sons. Physicians in our study thought that key barriers to vaccination acceptance when recommending to adolescent boys is the cost of the vaccine. As such, cost remains an important barrier, so it is timely for vaccine manufacturers and policymakers in Malaysia to revise the cost per dose administered.

The current study also revealed that physicians perceived the second key barrier to HPV vaccination as being parental perception that their adolescents are not susceptible to HPV infections. Lack of perceived susceptibility to HPV infection or HPV-related diseases among our conservative Malaysian society has always been an issue in several past studies on HPV vaccine acceptance among adolescent females (Wong 2010). In this study, a relatively higher proportion of physicians (20%) saw parental lack of perceived susceptibility as a key issue compared to only 8% in our previous study of barriers to HPV vaccine acceptance among female adolescents (Wong 2009b). This may imply that parents view adolescent boys as being relatively less susceptible to HPV infections than girls. Such gender disparities in perception of susceptibility warrant future studies targeting parents of adolescents in order to understand their reasons more fully. In this context, HPV-recommending physicians play an important role in educating parents about the equal susceptibility of boys getting HPV infection.

**Limitations**

Several limitations must be taken into account when interpreting the results of this study, the foremost of which is the low response rate that may possibly lead to sample bias. Secondly, the results underscore the potential limitations of self-report responses. Social desirability bias can be an issue with self-reports. Self-reporting can also cause recall bias. Despite these limitations, the study has the advantage of studying physicians’ perspectives on the HPV vaccine for boys where the vaccine is now approved to be given to adolescents in Malaysia.

**Conclusion**

The most common reasons for non-recommendation of the HPV vaccine were a lack of specific guidelines from the health authorities regarding HPV vaccination of boys, and a lack of awareness regarding the availability of the vaccine for boys. Health authority support and encouragement to physicians is essential to promote the recommendation of the HPV vaccine to adolescent boys. Public education should be imparted regarding the availability of the vaccine for boys and its benefits, safety and efficacy, as well as the high susceptibility of males to getting HPV infections.

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**Disclosure statement**

The authors report no conflicts of interest. The authors alone are responsible for the content and writing of the paper.

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