Commentary: The uptake of human papillomavirus vaccination: the power of belief

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The systematic review and meta-analysis of 'Inequalities in the uptake of human papillomavirus vaccination' in this issue of IJE reveals the complexities of identifying the diverse factors which determine HPV vaccination uptake. The authors note 'the factors affecting HPV vaccination in Black young women are not yet fully understood'.

Although the review particularly focuses on socioeconomic and ethnic disparities in HPV vaccine uptake among young women in the USA, it...
acknowledges additional underlying factors—beyond economic and ethnic determinants—which also affect the uptake of HPV vaccines confirmed in studies globally.\textsuperscript{1,4}

The determinants of HPV acceptance are very different from those around childhood vaccines. Firstly, the vaccine prevents a sexually transmitted infection (STI)—evoking the moral judgements and religious and cultural taboos that come with discussing and addressing sexual behaviour. In some settings, the vaccine is being promoted largely as a vaccine for cancer prevention, making it more culturally acceptable than an STI vaccine, particularly for adolescents.\textsuperscript{1,3} Secondly, and linked to the issue of it being an STI vaccine, are concerns about the appropriate age for vaccination in light of perceptions about the age of sexual debut. Thirdly, as confirmed by Fisher \textit{et al.},\textsuperscript{1} adolescents have less frequent interactions with the health system than younger children, making access a challenge in some settings.

Three other factors emerge frequently in the global literature about determinants of HPV vaccination uptake, which are also relevant to vaccines more broadly. One is the critical issue of cost which, in the case of HPV vaccine and other new vaccines, is more acute in the introduction phase when vaccine prices are generally higher and the vaccine is not yet fully adopted by national immunization schedules and budgets.\textsuperscript{2,3} The second is vaccine safety; and the third is vaccine efficacy—‘Will it work?’; ‘For how long?’ Concerns and uncertainty about the safety and efficacy of HPV vaccination are particularly acute given that the HPV vaccine is relatively new.\textsuperscript{2} In some cases, the vaccine’s ‘newness’ is reported to influence not only parent and patient hesitation, but even health professionals’ hesitation to encourage vaccination.\textsuperscript{2,3}

The Fisher analysis finds that there is ‘no strong evidence that religion and frequency of attendance at place of worship’ affects HPV vaccine uptake,\textsuperscript{1} but notes in the discussion that the studies analysed did not investigate religion as an ethnicity-related variable.

References to religion in the global literature suggest indirect influences such as causing the ‘embarrassment’ around accepting the HPV vaccine felt by 20% of young women participating in a study in Malaysia, which reported the embarrassment particularly raised by Muslims.\textsuperscript{2} The domain of ‘morality’ as distinct from religiosity is also discussed in some studies as playing a role in HPV vaccine decision-making, particularly as it pertains to age of sexual debut and partner infidelity.\textsuperscript{1} Some studies suggest a positive moral influence played by religion.\textsuperscript{1,2} Additional religious factors affecting vaccine acceptance included more vaccine-specific concerns such as whether or not the vaccine is ‘halal’ if produced by the West.\textsuperscript{5}

Perceptions of risk are an important domain of influence on vaccine acceptance generally, and HPV vaccination specifically, and were not addressed in the Fisher analysis.\textsuperscript{1} Perceptions of vaccine risk include concerns ranging from the noted anxiety about whether a vaccine is ‘halal’, to fears propagated by anti-fertility rumours as reported in HPV vaccine acceptance studies in Tanzania and Uganda,\textsuperscript{9} to distrust among African Americans prompted by historic events such as the Tuskegee Syphilis Study.\textsuperscript{10} Perceptions of vaccine safety risks and fears of adverse events following immunization (AEFI) are also amplified globally by the emergence of vaccine-questioning and anti-vaccine groups who disseminate reports of suspected AEFIs even when these have been confirmed as unrelated to vaccination. The influence of the US-based web network called ‘truthaboutguardasil.org’ in supporting India-based activists who pressured the Indian government to suspend an HPV vaccination demonstration project is a case in point.\textsuperscript{5}

The other area of risk that has a bearing on vaccine acceptance is perception of disease risk. Again, in the case of HPV, the acknowledgement of risk is inextricably tied to perceptions of sexual behaviour and can lead to understating real risk.

Across both perceptions of vaccine as well as disease risk, socio-economic and ethnic status influence perceptions and are important to understand. But there are other layers of factors at play. As one study concludes, ‘research has found that African American women are less likely to undergo HPV vaccination even with access to care’. As in the Fisher analysis, it suggests that belief systems ‘may’ play a role.\textsuperscript{11}

Analyses of socio-economic inequalities and ethnic differences mask a myriad of morals, beliefs, historical experiences and sensitivities which can weigh heavily in the decisions to accept—or not—HPV vaccination. These need to be understood.

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References
3 Krupp K, Marlow LAY, Kiellmann K \textit{et al.} Factors associated with intention-to-recommend human