



## Commentary

## Broadening the perspective on gender equity in immunization: The unique contributions of Human Papillomavirus vaccination

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### Commentary

Human Papillomavirus (HPV) vaccines have emerged as an effective solution to prevent cervical cancer, a leading cause of morbidity and mortality among women in low- and middle-income countries (LMICs). The World Health Organization (WHO) recommended primary target population for HPV vaccination is girls aged 9 to 14 years, prior to sexual debut – i.e. before the first exposure to HPV infection. By April 2016, 45 LMICs had implemented HPV vaccination either at small-scale through demonstration or other pilot projects, or nationwide [1]. As relayed by Gavi, the Vaccine Alliance upon request from the authors, as of September 2018, eight eligible countries had introduced HPV vaccination at scale and 17 were approved for support and planning for nationwide introduction, while seven more countries were expected to apply for support for national introduction in 2019 (A.Sidibe, personal communication).

The successful rollout of HPV vaccination raises gender and equity considerations that differ from those that have immunization of infants and children as their primary objective, which the authors have discussed elsewhere [2]. It also requires new delivery

platforms – including schools – and tailored strategies, since current efforts have not yet recognized adolescent health as a specific target for health programming at scale. Here we reflect on the unique contributions that HPV vaccination offers to understanding and advancing gender equity in immunization, and discuss its potential impact on health experiences and outcomes, as well as on increasing access to broader health services for the target population.

First, the analysis of equity should be approached with an intersectionality perspective that prompts a shift from consideration of gender as a single analytical category [3] to instead explore the diversity of girls' experiences, and the reinforcing mechanisms across dimensions of disparity. In this view, it is critical to consider the intersection of gender and age, or lifecycle. Adolescence – the period between 10 and 19 years of age – is marked by a transition of social roles in family, community, and school/employment. As young girls grow into adolescence, cultural and societal norms start yielding greater importance and influence [4,5]. While there is successful gender parity in primary education in many countries for instance, starting from age 10 the opportunity cost of sending girls (and boys) to school increases with their age, as do female school dropout rates [6]. Young adolescents targeted by HPV vaccination are subject to all drivers of inequity for infant and childhood vaccination such as parents' socio-economic status and education, caste/ethnicity, geographic setting, etc., but also experience

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barriers that are specific to their relative age. Compared to younger children or their older peers, for instance, young adolescents have less access to reliable and confidential health information, and fewer contacts with health services [5].

Second, there are programmatic challenges to reaching a population that is not routinely served by the health system. Across LMICs, various delivery strategies are combined for HPV vaccination, including health facility-based, outreach to community and/or schools, and campaigns. The extent to which in-reach or outreach HPV vaccination can synergize with other health care interventions aimed at this population target is highly context dependent. In fact, the setting for adolescent health care varies across settings: some countries provide services primarily through health facilities, while others additionally provide health care through schools or community agencies. Overall however, across LMICs, health care services for adolescents are highly fragmented, poorly coordinated and uneven in quality [7], and coverage is low or inadequate - especially among the most marginalized [8]. Studies show that the design of existing youth programs does not generally consider the internal heterogeneity of this population, with the result that specific sub-groups of vulnerable adolescents - such as younger adolescents and adolescents living in rural areas - are more likely to be missed [9]. School-based strategies are considered an important delivery platform for HPV vaccines since a large proportion of eligible girls can be found in school. This compels a closer look at patterns of school enrollment and completion in LMICs. In sub-Saharan Africa (SSA) alone, 23% of girls of primary school age (about 6 to 11 years) and 36% of girls in lower-secondary school age (about 12 to 14 years) were not enrolled in school in 2014 [10]. Furthermore, for those who are enrolled, regular attendance may be deterred by responsibilities for household chores, long distances, insecure travel routes, and inadequate facilities for girls to manage menstruation [6,11]. These barriers are more acute for the poorest girls: across SSA between 2010 and 2015, completion rates for this group were as low as 31% for primary school and 13% in lower secondary school. [6] Even in countries with comparatively high enrollment rates, school absenteeism was the primary reason for not being vaccinated in school-based HPV vaccine demonstration programs [12].

Third, it is critical to consider the impact of HPV vaccination at the population level. Scientific data show substantial long-term reductions in HPV infection and related diseases in unimmunized men and women, in settings with female-only programs, indicating herd effects [13]. From an equity perspective, this speaks to HPV vaccination as an opportunity for redistributing protection from HPV-related diseases among different population subgroups - *within* the female population as well as *across* gender. From a programmatic perspective, strong herd effects make controlling HPV very different from controlling other vaccine-preventable infectious diseases, in that impact may be achieved through sustainably maintaining control targets that do not require as high vaccination rates as other infectious diseases.

We conclude with two considerations within a health system perspective for how HPV vaccination can contribute to advancing gender equity. These call for alignment to a life course perspective or continuum-of-care approach to delivery, and for fostering synergies to drive adolescent health programs in countries with weak health systems.

HPV vaccination has brought attention to younger adolescents and marginalized groups such as out-of-school adolescents. Factors associated with poor school enrollment and completion - such as household low socio-economic status and rural residency, among others - coincide with risk factors for missed childhood vaccinations as well as early marriage, age-discordant relationships, and sexually transmitted infections including HPV [14]. These myriad factors will also likely affect access and/or uptake of preventive cervical screening services later in life. From a lifecycle perspective, adolescence is

an opportunity to reverse the prior life disadvantages and risks to better health outcomes in the short term and into adulthood [15]. Unlike infants and children, girls are not passive recipients of the HPV vaccine. Their active engagement is important not only to ensure uptake and impact of HPV vaccination; a positive experience with the health system can also lay the foundation for a lifetime of health-enhancing behaviors for themselves, and for their future children. Just as women's Tetanus Toxoid (TT) vaccination during pregnancy has shown to be a consistent predictor of child vaccination [16], young girls' and women's cumulative exposure to vaccination from adolescence through childbearing age may create a virtuous cycle of acceptance, understanding of the importance of vaccination, and ultimately utilization - leading to increases in children's immunization. It is thus critical to develop an evidence base to examine how gender inequities manifest and interact within this population, and examine what works not only to improve their health experiences and outcomes, but also to close the inequity gaps between groups accessing services and those with substantial barriers to receiving health care.

Finally, HPV vaccination has renewed the call for integration, i.e. leveraging the potential symbiosis with adolescent health care programs to reduce the cost and burden of delivering separate interventions, and mutually facilitate access to the target population. The WHO suggests that several interventions may be delivered in combination with HPV vaccine, including screening programs, commodities and treatment or other vaccines, and provision of information and life skills [17]. To date however, there has been limited experience of integration of HPV vaccination with other adolescent health services, and evidence of impact is not yet available [1]. Furthermore, while discussions on integration often focus on the service delivery level, many of the related challenges go beyond its scope and mandate, e.g. differing vertical delivery mechanisms and lack of inter-sectoral collaboration; limited availability of appropriately skilled health care workers; limited alignment of human resources organization and management, and role rationalization; and differing funding streams and funding predictability. Advancing integration to drive adolescent health care programs in countries with weak health systems requires considering integration across an upstream-downstream continuum. At the downstream end of service delivery, integration translates into delivering the HPV vaccine with other health care interventions. More upstream, integration might translate into policy complementarity whereby HPV vaccination is recommended as part of the school curriculum for instance, or operationalized in a platform for inter-sectoral collaboration between health, education and youth ministries for joint planning and coordination. These also should be considered opportunities for integration, even where joint delivery at the downstream is not yet viable. In this perspective, integration may need to be seen as a phased process, and countries should receive guidance on how to achieve this.

In sum, the potential of impactful improvement of health programming across the lifecycle and health care platforms will be integral to ensuring that HPV vaccination contributes to improve responsiveness of services to, and equitable outcomes for, this population.

#### Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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### Contributors

MF conceived the outline of the paper and wrote the first draft. AS commented on drafts and contributed intellectual content. Both authors agree with the manuscript's results and conclusions.

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